SPECIFICATIONS &

CONTRACT DOCUMENTS

FOR

TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION #30

CITY OF MORAINE, OHIO

MONTGOMERY COUNTY

OCTOBER 1, 2024

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BIDDING REQUIREMENTS

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LEGAL NOTICE

ADVERTISEMENT FOR BIDS

The City of Moraine will receive sealed bid proposals for ***TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION #30 PROJECT FOR CITY OF MORAINE*** until **OCTOBER 29, 2024** at ***10:00 a.m.*** local time, at the Moraine Municipal Building, 4200 Dryden, Moraine, Ohio, 45439 at which time and place they will be publicly opened and read aloud.

Copies of the specifications, proposal and contract forms are available on the City's website: www.ci.moraine.oh.us, "About the City" tab, "Legal Notices" on dropdown menu.

A pre-bid meeting for this project will be held on OCTOBER 15, 2024 at 10:00 a.m. local time at Fire Station #30.

Each proposal shall be signed with the full name and business address of each interested company and shall be accompanied by a security bond issued by a bonding company authorized to do business in the State of Ohio, or by a certified check on a solvent bank in the amount of ten percent (10%) of the amount of the submitted main contract proposal. Bond or certified check must be payable to the City of Moraine as a guarantee that if the proposal is accepted, a contract will be executed and its performance secured by a satisfactory bond in the amount of one hundred percent (100%) of the contract price or irrevocable letter of credit.

The proposal must be made on the forms provided in the Contract Documents, or a copy thereof, with a price quoted for the proposed maintenance services.

City Council reserves the right to accept or reject any or all proposals, to waive any informalities or irregularities in the bids received, or to accept any proposal which is deemed most favorable to the City of Moraine.

_____

Mike Davis, City Manager

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BIDDING INFORMATION

All bids must be submitted on forms provided in this packet. Bids must be regular in every respect and no changes, deletions, or special conditions shall be made or included in the bid form.

Bid documents shall be submitted in a sealed envelope, marked with the Bidder's return address, and be labeled "Bid Documents for Toilet Room Renovations At City of Moraine Fire Station #30" and addressed as follows:

To: Mike Davis
City Manager
City of Moraine
4200 Dryden Road
Moraine, OH 45439

Bid Opening: OCTOBER 29, 2024 at 10:00 a.m. local time.

No Bidder may withdraw its bid after the specified time of the opening of the bids.

Project Estimated Amount: $400,000 for the base bid scope of work, inclusive of allowances, not factoring alternates.

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INSTRUCTIONS TO BIDDERS

1. Bidding documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Legal Notice or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid for, and contract forms. The proposed Contract Documents consist of the form of agreement between the Owner and Contractor, Conditions of the Contract (General, Supplemental, and other Provisions), Specifications and all Addenda issued prior to the execution of this Contract.

2. The Bidder, by making a Bid, represents that:

   A. The Bidder has read and understands the Bidding Documents and the Bid is made in accordance herewith.

   B. The Bidder has read and understands the Bidding Documents or contract documents to the extent that such documentation relates to the work for which the Bid is submitted.

   C. The Bidder has visited sites, become familiar with local conditions, become familiar with the equipment listed in the Contract Documents, and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents and shall report to the Superintendent errors, inconsistencies or ambiguities discovered.

   D. The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

3. Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

4. Addenda

   A. Addenda will be mailed or delivered to all who are known by the issuing office to have received a complete set of Bidding Documents.

   B. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

   C. No Addenda will be issued later than four (4) days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one that includes postponement of the date for receipt of Bids.

D. Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and Bidder shall acknowledge receipt in the Bid.

5. Bidding Procedures – Form and Style of Bids

A. Bids shall be submitted on forms identical to the form included with the Bidding Documents.

B. All blanks on the bid form shall be filled in by typewriter or manually in ink.

C. Where indicated by the makeup of the bid form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern.

D. The signer of the Bid must initial alterations and erasures.

E. Each copy of the Bid shall include the legal name of the Bidder and a statement that the Bidder is a sole proprietor, partnership, corporation, or other legal entity. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A bid by a corporation shall further give the State of incorporation and have the corporate seal affixed. A bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

6. Bidding Procedures – Submission of Bids

A. All copies of the Bid and other documents required for submission with the Bid shall be enclosed in a sealed envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the project name, and the Bidder's name and address. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

B. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

C. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

D. Oral, telephonic or telegraphic Bids are invalid and will not receive consideration.

E. A Bid must remain open for acceptance for a period of sixty (60) days from the date of bid opening. A bid may be extended thereafter upon mutual agreement of the Owner and the Bidder.

7. Bidding Procedures – Modification or Withdrawal of Bid

A. A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

B. Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of such Bids. Such notice shall be in writing over the signature of the Bidder or by telegram. If by telegram, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

C. Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided they are then in full conformance with these Instructions to Bidders.

8. The Owner is soliciting Bids pursuant to the bid process. If the Owner awards a Contract, it shall be to the lowest responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities or irregularities in a Bid. The Owner shall have the right to reject any or all Bids, reject a Bid not accompanied by any data required by the Bidding Documents, or reject a Bid that is in any way incomplete or irregular.

9. The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the bidding Documents, and to determine the low Bidder on the basis of the sum of the base Bid and Alternates accepted.

10. Bidders to whom award of a Contract is under consideration shall submit a Contractor's Qualification Statement.

11. Persons and entities proposed by the Bidder and to whom the Owner and Superintendent have made no reasonable objection must be used on the work for which they were proposed and shall not be changed except with written consent of the Owner and Superintendent.

12. This is a prevailing wage job and the successful Bidder must comply with all applicable laws, rules and regulations applicable thereto.

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Contractor's and Subcontractor's Insurance

SECTION 11. The Contractor and/or subcontractor on this work will be required to take out and maintain during the life of this Contract, the comprehensive commercial insurance listed below, and approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder. The Contractor shall purchase the insurance listed below to protect the Owner and authorized representatives from all claims incurred by the action(s) of the Contractor and/or subcontractors in completion of this work.

I. Compensation and Employees' General Liability Insurance

The Contractor shall procure and shall during the life of this Contract hold Workers Compensation coverage for all of Contractor's employees to be engaged in work under this Contract; and in case any such work is sublet, the Contractor shall require the subcontractor similarly to provide Workers Compensation coverage for all of the latter's employees to be engaged in such work, unless such employees are covered by the protection afforded by the Contractor's Workers Compensation coverage. The Employees Liability limit shall be as provided by statutory requirements of the State. In case any class of employees is engaged in hazardous work protected under the Workers Compensation statute, the Contractor shall provide and shall cause each subcontractor to provide Employer's General Liability Insurance for the protection of such of his employees not otherwise protected.

II. Public Liability and Owner's or Contractor's Protective Insurance

The Contractor shall take out and maintain this type of insurance and shall require any of his subcontractors performing work covered by the Contract to do the same in order to protect themselves from claims for damage to property which may arise from operations under this Contract, whether such operations be by Contractor or by any Subcontractor or by anyone directly or indirectly employed by either of them.

A. (Comprehensive) Automobile Liability Coverage:

i. Bodily injury including wrongful death in an amount not less than Five Hundred Thousand Dollars ($500,000.00) for each person and One Million Dollars ($1,000,000.00) for each accident.

ii. Property damage in an amount not less than One Hundred Thousand Dollars ($100,000.00) for each accident.

B. (Comprehensive) General Liability Coverage:

i. Bodily injury including wrongful death in an amount not less than Five Hundred Thousand Dollars ($500,000.00) for

each person and One Million Dollars ($1,000,000.00) for each accident, and

ii. Property damage in an amount not less than One Hundred Thousand Dollars ($100,000.00) for each accident, and an aggregate liability of Two Hundred Fifty Thousand Dollars ($250,000.00).

III. Scope of Insurance and Special Hazards

The insurance required under paragraph II hereof shall be primary insurance and provide adequate protection for the Owner, its elected officials, employees, or volunteers, Contractor and subcontractor respectively, against damage claims which may arise from operations under this Contract, whether such operations are by the insured or by anyone directly or indirectly employed by Contractor, and also against any of the special hazards which may be encountered in the performance of the Contract. Each of the aforesaid policies shall include the Owner as named additional insured and will provide that such policy will not be canceled until after the Owner shall have been given twenty

(20) business days written notice of the proposed cancellation. Contractor's insurance shall be the primary insurance, and any insurance maintained by Owner, its elected officials, employees, or volunteers shall be excess to the Contractor's insurance and shall not contribute to it.

Contractor agrees to hold Owner harmless and indemnify Owner, its elected officials, employees, and volunteers for any and all claims resulting from the actions of the Contractor, its officials, employees, volunteers, and any subcontractors.

CONTRACTOR'S ALERT

REMINDER

If you are the successful bidder for work on any state, county, township, municipal corporation, school district, or other political subdivision of the State of Ohio, please keep in mind that if after award of the contract you are required to perform additional work as a result of the enactment or amendment of any statutes, ordinances, and regulations, including but not limited to those dealing with prevention of environmental pollution, then you are entitled to a change order for the cost of said additional work plus reasonable profit. The owner must issue a change order describing said additional work to you. **NOTE: You are not entitled to payment until an approved change order has been issued.**

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Bid Guaranty and Contract Bond

(ORC 153.571)

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

_____, as Principal, and

_____, as Surety, are hereby

held and firmly bound unto the *City of Moraine* as Obligee in the penal sum of the dollar amount of the bid submitted by the Principal to the Obligee on

_____ to undertake the Project known as the

TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION #30

The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of

_____ dollars

($_____).

(If above line is left blank, the penal sum will be the full amount of the Principal's bid, including alternates. Alternatively, if completed, the amount stated must not be less than the full amount of the bid, including alternates, in dollars and cents. A percentage is not acceptable.)

For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

Signed this_____day of_____, 2024.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that whereas the above named Principal has submitted a bid for _____

_____

NOW, THEREFORE, if the Obligee accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid and specifications; and in the event the Principal pays to the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the Principal pays to the Obligee the difference not to exceed ten percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with resubmission, of printing new contract documents, required advertising, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect. If the Obligee accepts the bid of the Principal and the Principal within ten days after award of the contract enters into a proper contract in accordance with the bid and specifications, which said contract is made a part of this bond the same as though set forth herein; and

IF THE SAID_____shall well and faithfully do and perform the things agreed by the *City of Moraine, Ohio* to be done and performed according to the terms of said contract; and shall pay all lawful claims of

subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions in or to the terms of said contract or in or to the plans or specifications therefore shall in any way affect the obligations of said Surety on its bond.

Principal:	Surety:
_____	_____
By:_____	By:_____
Title:_____	Title:_____

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AFFIDAVIT

Regarding payment of Montgomery County Personal Property Taxes (Bidder to complete and execute either Part A or Part B).

STATE OF_____)

) SS:

COUNTY OF_____)

Part A. That_____, being duly sworn, affirms that as of

_____, 2024,_____is not charged with any delinquent personal property taxes on the general tax list of personal property of Montgomery County, Ohio.

_____

Bidder

OR ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Part B. That_____, being duly sworn, affirms that

_____ is currently charged with Montgomery County delinquent personal property taxes in the amount of $_____with interest in the amount of _____, and penalties in the amount of $_____, due to said Montgomery County, Ohio.

_____

Bidder

SWORN TO and subscribed before me this_____day of_____, 2024.

_____

Notary Public in and for

_____ County, Ohio.

My commission expires: _____

NOTE: If this statement indicates that the taxpayer was charged with any such taxes, a copy of the statement shall be transmitted by the Director of Finance to the County Treasurer within thirty (30) days of the date it is submitted.

NOTE: A copy of this statement shall be incorporated into the contract, and no payment shall be made with respect to said contract unless such statement has been incorporated as a part thereof.

Affidavit of Compliance

NON-COLLUSION AFFIDAVIT

STATE OF_____)

) SS:

COUNTY OF_____)

_____, being first duly sworn, deposes and says that he/she is the

_____ (sole owner, partner, president, secretary, etc.) of

_____, the party making the foregoing proposal or bid; that such bid is genuine and not collusive or sham; and that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any other bidder or person, to put in a sham bid, or that such other person shall refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit, or cost element of said bid price, or of that of any other bidder, or to secure any advantage against any company, person or persons interested in the proposed contract; and that all statements contained in said proposal or bid are true. Further, that such bidder has not, directly or indirectly, submitted this bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or agent thereof.

_____

Affiant

SWORN TO and subscribed before me this_____day of_____, 2024.

_____

Notary Public in and for

_____ County, _____

state

My commission expires: _____

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AFFIDAVIT

(TO BE COMPLETED IF THE CONTRACTOR IS A CORPORATION)

STATE OF_____)

) SS:

COUNTY OF_____)

_____, being duly sworn, deposes and says that he/she is

_____ (president, secretary, etc.) of

_____, a corporation organized and existing under and by virtue of

the laws of the State of_____, and having its principal office at

_____,

(number and street)

_____,_____.

(city) (state)

Affiant further states that he is familiar with the records, minute books and by-laws of

_____.

(name of corporation)

Affiant further states that_____,_____,

(name) (title)

of the corporation, is duly authorized to sign the contract for the provision of services for the ***TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION #30*** or said corporation by virtue of

_____

(State whether a provision of bylaws or a resolution of the Board of Directors. If by resolution, give date of adoption.)

_____

Affiant

SWORN TO and subscribed before me this_____day of_____, 2024.

_____

Notary Public in and for

_____ County, _____

state

My commission expires: _____

AFFIDAVIT

Drug and Alcohol Abuse Prevention and Testing Policy and Procedure

This Affidavit is required when needed regarding existence of a program and compliance with the Omnibus Transportation Employee Testing Act of 1991 (the "Act"). The Act requires that any bidder who supplies operators of safety sensitive equipment provide a **Drug and Alcohol Abuse Prevention and Testing Policy and Procedure.** The program shall provide the minimal standards as stated in the Act and cover such issues as pre-employment, reasonable suspicion, random, post-accident, return-to-work, and follow-up testing of safety-sensitive employees.

The bidder is to complete and have notarized this Affidavit if successful in receiving the contract and may be required to provide a copy of the policy.

STATE OF_____)

) SS:

COUNTY OF_____)

_____, being duly sworn, affirms that as of_____, 20____,

_____ has developed and implemented a Drug and Alcohol Abuse Prevention and Testing Policy and Procedure in compliance with the Act.

_____

Affiant

SWORN TO and subscribed before me this_____day of_____, 2024.

_____

Notary Public in and for

_____County, _____

state

My commission expires: _____

NOTE: A copy of this statement shall be incorporated into the contract, and no payment shall be made with respect to said contract unless such statement has been incorporated as a part thereof.

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AFFIDAVIT IN COMPLIANCE WITH SECTION 3517.13 OF THE OHIO REVISED CODE

STATE OF _____

COUNTY OF_____SS:

Personally appeared before me the undersigned, as an individual or as a

representative of_____for a
(Name of Entity)

contract for ***TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION #30*** to be let by the City of Moraine, who, being duly cautioned and sworn, make the following statement with respect to prohibited activities constituting a conflict of interest or other violations under Ohio Revised Code Section 3517.13, and further states that the undersigned has the authority to make the following representation on behalf of himself or herself or of the business entity:

1) That none of the following have **individually** made within the previous twenty-four months and that, if awarded a contract for the purchase of goods or services aggregating more than $10,000 in a calendar year, none of the following Individually will make, beginning on the date the contract is awarded and extending until one year following the conclusion of the contract, as an individual, one or more campaign contributions totaling in excess of $1,000, to any member of the City of Moraine Council or their individual campaign committees:
   a) myself;
   b) any partner or owner of the partnership or other unincorporated business (if applicable);
   c) any shareholder of the professional association organized under Chapter 1785 of the Ohio Revised Code (if applicable);
   d) any trustee of the trust (if applicable);
   e) any administrator or executor of the estate (if applicable);
   f) any owner of more than 20% of the corporation or business trust (if applicable);
   g) each spouse of any person identified in (a) through (f) of this section;
   h) each child seven years of age to seventeen years of age of any person identified in divisions (a) through (f) of this section;
2) That none of the following have **collectively** made within the previous twenty-four months, and that, if awarded a contract for the purchase of goods or services aggregating more than $10,000 in a calendar year, none of the following **collectively** will make, beginning on the date the contract is awarded and extending until one year following the conclusion of the contract, one or more campaign contributions totaling in excess of $2,000, to any member of the City of Moraine Council or their individual campaign committees:
   a) myself;

b) any partner or owner of the partnership or other unincorporated business (if applicable);

c) any shareholder of the professional association organized under Chapter 1785 of the Ohio Revised Code (if applicable);

d) any trustee of the trust (if applicable);

e) any administrator or executor of the estate (if applicable);

f) any owner of more than 20% of the corporation or business trust (if applicable);

g) each spouse of any person identified in (a) through (f) of this section;

h) each child seven years of age to seventeen years of age of any person identified in divisions (a) through (f) of this section;

i) any political action committee affiliated with the corporation, business trust, partnership or other unincorporated business, association, estate or trust identified in (a) through (f) of this section;

j) Any combination of persons identified in (a) through (i) of this section;

3) I do hereby acknowledge that to knowingly make any false statement herein may subject me and/or the above-named entity to the penalties set forth in Section 3517.992 of the Ohio Revised Code.

Further, Affiant sayeth naught.

Signature _____

Title _____

Sworn to before me and subscribed in my presence this_____day of

_____, 2024.

_____
Notary Public

My Commission Expires: _____

The requirements of Ohio Revised Code Section 3517.13 are only applicable to contributions made **on or after April 4, 2007** (Section 631.05, Amended Substitute Ohio House Bill 119).

Affidavit of Insurance

STATE OF_____)

) KNOW ALL MEN BY THESE PRESENTS

COUNTY OF_____)

BEFORE ME, the undersigned authority, on this day, personally appeared

_____, who being duly sworn, stated that he/she is

(Affiant)

_____, of_____,

(Title) (Contractor's Company Name)

the Contractor named and referred to within the Contract Documents; that he/she is fully competent and authorized to give this affidavit and that the attached original insurance certificate truly and accurately reflects the insurance coverage that is now available and will be available during the term of the Contract.

_____

Affiant

SWORN AND SUBSCRIBED before me on the_____day of_____, 2024.

_____

Notary Public

In and for the County of _____

State of_____

My commission expires:_____

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Department of Commerce
Division of Industrial Compliance

Bureau of Wage and Hour Administration
6606 Tussing Road - PO Box 4009
Reynoldsburg, OH 43068-9009
Phone 614-644-2239 | Fax 614-728-8639
TTY/TDD 800-750-0750
www.com.ohio.gov
An Equal Opportunity Employer and Service Provider

John R. Kasich, Governor
Andre T. Porter, Director

Affidavit Of Compliance

PREVAILING WAGES

I, _____
(Name of person signing affidavit) (Title)

do hereby certify that the wages paid to all employees of

_____
(Company Name)

for all hours worked on the

_____
(Project name and location)

project, during the period from _____ to _____ are in
(Project Dates)

compliance with prevailing wage requirements of Chapter 4115 of the Ohio Revised Code. I further certify that no rebates or deductions have been or will be made, directly or indirectly, from any wages paid in connection with this project, other than those provided by law.

_____
(Signature of Officer or Agent)

Sworn to and subscribed in my presence this _____ day of _____,

20_____.

_____ (Notary Public)

The above affidavit must be executed and sworn to by the officer or agent of the contractor or subcontractor who supervises the payment of employees. This affidavit must be submitted to the owner (public authority) before the surety is released or final payment due under the terms of the contract is made.

LAW1003

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**************FOR INSTRUCTIONAL USE ONLY ***************

READ BEFORE COMPLETING YOUR DMA FORM

Forms not conforming to the specifications listed below or not submitted to the appropriate agency or office will not be processed.

To complete this form, you will need a copy of the Terrorist Exclusion List for reference. The Terrorist Exclusion List can be found on the Ohio Homeland Security Web site at the following address:
http://www.homelandsecurity.ohio.gov/dma/dma.asp
Be sure you have the correct DMA form. If you are applying for a state issued license, permit, certification or registration, the "State Issued License" DMA form must be completed (HLS 0036). If you are applying for employment with a government entity, the "Public Employment" DMA form must be completed (HLS 0037). If you are obtaining a contract to conduct business with or receive funding from a government entity, the "Government Business and Funding Contracts" DMA form must be completed (HLS 0038).
Your DMA form is to be submitted to the issuing agency or entity. "Issuing agency or entity" means the government agency or office that has requested the form from you or the government agency or office to which you are applying for a license, employment or a business contract. For example, if you are seeking a business contract with the Ohio Department of Commerce's Division of Financial Institutions, then the form needs to be submitted to the Department of Commerce's Division of Financial Institutions. Do NOT send the form to the Ohio Department of Public Safety UNLESS you are seeking a license from or employment or business contract with one of its eight divisions listed below.
Department of Public Safety Divisions:
Administration
Ohio Bureau of Motor Vehicles
Ohio Emergency Management Agency
Ohio Emergency Medical Services Ohio Homeland Security*
Ohio Investigative Unit
Ohio Criminal Justice Services
Ohio State Highway Patrol

* DO NOT SEND THE FORM TO OHIO HOMELAND SECURITY UNLESS OTHERWISE DIRECTED. FORMS SENT TO THE WRONG AGENCY OR ENTITY WILL NOT BE PROCESSED.

**************FOR INSTRUCTIONAL USE ONLY***************

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GOVERNMENT BUSINESS AND FUNDING CONTRACTS

In accordance with section 2909.33 of the Ohio Revised Code

DECLARATION REGARDING MATERIAL ASSISTANCE/NONASSISTANCE TO A TERRORIST ORGANIZATION

This form serves as a declaration by an applicant for a government contract or funding of material assistance/non-assistance to an organization on the U.S. Department of State Terrorist Exclusion List ("TEL"). Please see the Ohio Homeland Security Division Web site for a copy of the TEL.

Any answer of "yes" to any question, or the failure to answer "no" to any question on this declaration shall serve as a disclosure that material assistance to an organization identified on the U.S. Department of State Terrorist Exclusion List has been provided. Failure to disclose the provision of material assistance to such an organization or knowingly making false statements regarding material assistance to such an organization is a felony of the fifth degree.

For the purposes of this declaration, "material support or resources" means currency, payment instruments, other financial securities, funds, transfer of funds, financial services, communications, lodging, training, safe houses, false documentation or identification, communications equipment, facilities, weapons, lethal substances, explosives, personnel, transportation, and other physical assets, except medicine or religious materials.

COMPLETE THIS SECTION ONLY IF YOU ARE AN INDEPENDENT CONTRACTOR

LAST NAME	FIRST NAME	
HOME ADDRESS		
CITY	STATE	ZIP	COUNTY
HOME PHONE ( )	WORK PHONE ( )	

COMPLETE THIS SECTION ONLY IF YOU ARE A COMPANY, BUSINESS OR ORGANIZATION

BUSINESS/ORGANIZATION NAME	PHONE ( )
BUSINESS ADDRESS	
CITY	STATE	ZIP	COUNTY
BUSINESS/ORGANIZATION REPRESENTATIVE NAME	TITLE

DECLARATION

In accordance with section 2909.32 (A)(2)(b) of the Ohio Revised Code

For each question, indicate either "yes," or "no" in the space provided. Responses must be truthful to the best of your knowledge.

1. Are you a member of an organization on the U.S. Department of State Terrorist Exclusion List? Yes No
2. Have you used any position of prominence you have with any country to persuade others to support an organization on the U.S. Department of State Terrorist Exclusion List? Yes No
3. Have you knowingly solicited funds or other things of value for an organization on the U.S. Department of State Terrorist Exclusion List? Yes No
4. Have you solicited any individual for membership in an organization on the U.S. Department of State Terrorist Exclusion List? Yes No
5. Have you committed an act that you know, or reasonably should have known, affords "material support or resources" to an organization on the U.S. Department of State Terrorist Exclusion List? Yes No
6. Have you hired or compensated a person you knew to be a member of an organization on the U.S. Department of State Terrorist Exclusion List, or a person you knew to be engaged in planning, assisting, or carrying out an act of terrorism? Yes No

If an applicant is prohibited from receiving a government contract or funding due to a positive indication on this form, the applicant may request the Ohio Department of Public Safety to review the prohibition. Please see the Ohio Homeland Security Web site for information on how to file a request for review.

CERTIFICATION

I hereby certify that the answers I have made to all of the questions on this declaration are true to the best of my knowledge. I understand that if this declaration is not completed in its entirety, it will not be processed and I will be automatically disqualified. I understand that I am responsible for the correctness of this declaration. I understand that failure to disclose the provision of material assistance to an organization identified on the U.S. Department of State Terrorist Exclusion List, or knowingly making false statements regarding material assistance to such an organization is a felony of the fifth degree. I understand that any answer of "yes" to any question, or the failure to answer "no" to any question on this declaration shall serve as a disclosure that material assistance to an organization identified on the U.S. Department of State Terrorist Exclusion List has been provided by myself or my organization. If I am signing this on behalf of a company, business or organization, I hereby acknowledge that I have the authority to make this certification on behalf of the company, business or organization referenced on page 1 of this declaration.

APPLICANT SIGNATURE **X**	DATE

CERTIFICATE OF FISCAL OFFICER

As Fiscal Officer for the City of Moraine, Montgomery County, Ohio, I hereby certify that funds in the amount of_____Dollars have been lawfully appropriated for the purpose of meeting the obligations of this contract with_____duly authorized by Resolution No._____approved by the City of Moraine Council, Montgomery County, Ohio, and that they are in the treasury or in the process of collection to the credit of the City of Moraine free from any previous encumbrances.

Signed this_____day of_____, 2024.

_____,
Fiscal Officer for the City of Moraine,
County of Montgomery,
State of Ohio

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PROPOSAL for:

Toilet Room Renovations at

City of Moraine Fire Station #30
City of Moraine

The undersigned,_____, having carefully inspected the sites and locations of the work proposed to be performed, and also the premises at and adjacent to the location of the proposed work and specified equipment and conditions thereof, and having also carefully examined the "Notice to Contractor," "Instruction to Bidders," "Form of Contract," "General Provisions," and the detailed specifications which shall govern the work to be done, NOW PROPOSES to furnish any and all materials, tools, labor, transportation, machinery, appliances and/or necessary appurtenances, and to prosecute to full completion the work called for under the Contract Documents, all upon the terms and the conditions and provisions set forth in the "Instructions to Bidder," "Form of Contract," "Contract Bond," and "General Provisions," detailed specifications of this Proposal; and in consideration thereof to accept from the Owner as full payment for the completion of each specified item and any required maintenance thereof as hereinafter provided, the price quoted for each item for work completed, the price of labor and materials to be stated separately.

The undersigned_____agrees that if this Proposal shall be accepted, he will be prepared to discuss with the Owner in detail any matters relating to special features and the methods he proposes to follow for the general conduct of the work; that he will within twenty (20) business days after notice of acceptance of bid, complete the Contract Form with the Owner for the performance of the work and furnish evidence of required insurance policies.

The undersigned_____hereby certifies that no person interested in this Proposal is directly or indirectly interested in or connected with any other bid or proposal for the said work and no member of the City of Moraine or any other person in the employ of said City is directly or indirectly interested therein, or in any portion thereof, and he will, if required by the Owner, execute and submit from himself as Principal Contractor and from any subcontractor, the non-collusion affidavits as provided herein.

SUM PROPOSAL PRICE FOR: Toilet Room Renovations At Moraine Fire Station #30

And having inspected the premises and all conditions affecting the work, the undersigned proposes to furnish all materials and perform all labor necessary for the performance and completion of the work indicated below, all in compliance with the documents named above, and further agrees that each separate item of trade or employment further agrees that, if any or all of said bids are accepted, he will enter into a Contract according to the form required by the Owner for the faithful performance of the labor and the furnishing of all materials included in such bid or bids so accepted.

Submitted by: _____

Contracting Firm

Having read and examined the Contract Documents, prepared by the Associate for the above-referenced Project, and the following Addenda:

Addendum No.	Date of Receipt
_____	_____
_____	_____
_____	_____

The undersigned Bidder having full knowledge of the site and the requirements of the Project proposes to perform all Work in accordance with the Contract Documents for the Sums as indicated on this Bid Form:

Base Bid Item 1 – General Trades / Renovation, ALL LABOR, MATERIALS, EQUIPMENT and PERMIT FEES for the total sum of

Base Bid Amount:	$_____
Contingency Allowance:	$30,000
Permit Allowance:	$3,000

Total Bid Amount including All Allowances

$_____ $_____

[FIGURES] [WORDS]

Signed at_____this_____day of_____, 2024.

Firm: _____

By: _____

Title:_____

(SEAL)

Official Address:

_____

_____

_____

_____
(Telephone Number)

PREVAILING WAGE REQUIREMENTS

This project is subject to Prevailing Wages.
Contractor to comply with all applicable requirements.

Refer to wagehour.com.ohio.gov

CONTRACT

FORM OF CONTRACT

THIS AGREEMENT, entered into this____day of_____, 2024, by and between the *City of Moraine, Ohio*, hereinafter called the "Owner" and _____ hereinafter called the "Contractor."

WITNESSETH: That the said Contractor has agreed and by these presents does agree with the said Owner for the consideration hereinafter named, to furnish all the materials and do all of the work of whatever kind necessary to complete, in a good, substantial, and workmanlike manner, ready for use, and in strict accordance with the specifications on file in the office of the Maintenance Superintendent, and subject to all the terms and conditions of said specifications, and to the approval of said Superintendent, for the provision of services for the

TOILET ROOM RENOVATIONS AT CITY OF MORAINE FIRE STATION # 30
CONTRACT FOR CITY OF MORAINE

in accordance with the Contract Documents dated August 2024, and Addenda thereto numbered and dated___, for

The sum of**_____thousand Dollars, ($,000.00)** for Renovation Project.

The Owner agrees to pay, and the Contractor agrees to accept as full compensation, satisfaction, and discharge for all work done and material furnished, and also for all costs and expenses incurred and losses or damages sustained by reason of the action of the elements or because of the nature of the work or because of any unforeseen obstruction or difficulty encountered in the prosecution of the work, herein as specified and also for well and faithful completion of the work, and the whole thereof, in accordance with the terms, conditions and provisions of this contract and the instructions, orders, and directions of the Superintendent hereunder, and also for maintaining the work in good condition, except extra work which shall be paid for as provided in the General Conditions and except as in this Contract otherwise specifically provided, a sum of money equal to the amount of the actual work furnished, as determined by the Superintendent, as set forth in the Proposal attached hereto.

WITNESSETH, that in consideration of the sums of money herein specified to be paid by the

CONTRACTOR:	OWNER:
_____ (name of company)	City of Moraine
By: _____	By: _____
_____ (title)	_____ (title)

Contract approved as to form _____

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TECHNICAL SPECIFICATIONS

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Contract Documents for:

Toilet Room Renovations At City of Moraine Fire Station #30

3333 Pinnacle Park Drive
Moraine, OH 45439

Prepared for:

City of Moraine
4200 Dryden Road
Moraine, OH 45439

Prepared by:

RDA GROUP ARCHITECTS
7662 PARAGON ROAD | DAYTON, OH 45459 | 937.610.3440

BID SET
October 1, 2024

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DOCUMENT 00 01 10 - TABLE OF CONTENTS

END OF DOCUMENT

SECTION 01 00 00 - GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION OF THE PROJECT DOCUMENTS

A. The work covered by these specifications consists of furnishing all labor, equipment and materials necessary in connection with the Toilet Room Renovations at the City of Moraine Fire Station #30. Work includes items as shown, subject to the terms and conditions of the contract, specifications and the drawings as listed.

1.2 CONTRACT DESCRIPTION

A. Project Identification: **Toilet Room Renovations at Moraine Fire Station #30**

B. Project Location: City of Moraine Fire Station #30
3333 Pinnacle Park Drive
Moraine, OH 45439

C. Owner: City of Moraine
4200 Dryden Road
Moraine, OH 45439

D. Architect: RDA Group Architects, LLC
7662 Paragon Road
Dayton, OH 45459
937.610.3440

E. PME Engineer: Helmig Lienesch, LLC
410 S. Jefferson Street
Dayton, OH 45402
937.228.4007 phone

F. Perform Work of Contract under a stipulated sum contract with Owner in accordance with Conditions of Contract.

1.3 CONTRACTOR'S USE OF PREMISES

A. Coordinate work to allow continued Owner Occupancy of the building. Coordinate any requirements that would prevent the building from use. **Project must allow continued use / access to all areas outside of the toilet rooms.**
   1. Owner will provide temporary toilet room facilities on site for Building Occupants.

B. The project will need to be sequenced / phased to allow continued operations. Develop a plan and strategy to accomplish the goal. All additional efforts, scheduling, construction duration, etc. shall be considered and included in the bid amount.

C. Coordinate all applicable life safety aspects of the project to ensure the existing building is safe for continued use.

D. The Owner will coordinate relocation of loose furnishings, equipment, etc. out of the work area as necessary to facilitate work.

E. Work Hours: 7am – 5pm Monday thru Friday. Extended work hours thru the week and weekend work is permitted upon acceptance of the Owner.
   1. There are no specific limits on work hours as long as access to the building may be coordinated with the Owner. It is anticipated that the work will substantially occur during first shift hours, some work may be required to be accomplish off first shift hours to maintain operations of the building.

2. The burden for scheduling and coordinating work efforts shall be on the General Contractor.
3. Contractor shall determine how the various disciplines work together and are scheduled to permit the work as outlined.
4. Accomplish utility shutdowns off hours as applicable to maintain operations, coordinate with Owner.
5. Additional weekend and overtime work, supplementation of the Crews, etc. may be required by the Owner at no additional cost if the Contractor fails to meet milestone dates as prescribed in the contract.

F. Coordinate work of this contract with other work that will be occurring by the Owner. Coordinate work schedules to minimize impact to the extent possible.

1.4 CONTRACT PERIOD

A. Date of Commencement: approximately January 2025, as outlined in Supplementary Conditions. A Notice to Proceed will be issued establishing the agreed upon construction start date.

B. Date of Substantial Completion: 150 calendar days from the Date of Commencement

C. A contract will be issued in December 2024 after approval by City Council.
1. The Contractor will be responsible to execute the project to allow shop drawings and product submittals to be prepared as quickly as possible such that the materials can be ordered with sufficient lead time to permit the work to be executed as scheduled prior to the date of substantial completion.

D. Coordinate schedule / activities so as not to inconvenience the Owner unnecessarily.

1.5 PROJECT ALLOWANCES

A. Contingency Allowance: Include a cost contingency allowance in the amount of $30,000 in the base bid amount.

B. Permit Allowance: Include a permit allowance in the amount of $3,000 in the base bid amount.

C. Contingency funds shall only be used at the approval of RDA and Owner.

D. Actual expenditures shall be tracked over the duration of the project with any unused funds deducted from the contract at the end of the project.

E. All expenditures shall be identified and documented as they occur, not afterward. Work commenced without the approval of the Owner shall be at the Contractor's risk.

1.6 INSTRUCTIONS/RESPONSBILITIES OF THE CONTRACTOR

A. Protect all finishes and equipment scheduled to remain.

B. Commence and complete work as noted in the contract.

C. Furnish labor, materials, equipment, and management required to complete the project, inclusive of all sub-contracted components.

D. Furnish all required logistics required to accomplish the work – including lifts, scaffolding, ladders, trash chutes, safety equipment, etc.
1. Coordinate all Contractor staging areas and layout areas, etc. Receive approval from the Owner prior to the start of the project.
2. Provide protection of all existing pavement, turf, etc. from lifts, lulls, etc. which may be utilized on the project.
3. Provide temporary protection, barricades, enclosures at other building areas such to contain the construction area, and to minimize the transfer of dust, odors, etc.

E. Visit the site to become thoroughly familiar with all working conditions, check and verify all dimensions, and site conditions. Any dimensions given or referred to in the specification or

drawing are to be used purely as approximate and not as a basis for exact amounts for bidding. Promptly advise the Architect of any discrepancies, errors with the specifications and drawings before bidding the work.

F. Provide a valid Certificate of Insurance, follow all Workman's Compensation requirements and regulations, and conduct all work according to OSHA recognized safe work practices.

G. Provide all bonds, payment schedule, insurance as noted in the contract documents.

H. The plans and specifications are intended to depict the general scope, layout and quality of workmanship required, they are not intended to show or describe in detail every item necessary for the proper installation of the work.

I. Take special care not to allow dust and debris to fall onto any equipment, material, personnel, or any room below the deck.
   1. Provide Safety Data Sheets (SDS) on all products used.

J. Submit directly to Owner. RDA does not review nor approve SDS.

K. The term 'Architect' as referenced in these contract documents is RDA Group Architects.

L. The term 'Owner' as referenced in this specification is City of Moraine.

1.7 WORK BY THE OWNER

A. Owner will clear all loose furnishings, equipment, and other materials from the work area prior to the start of the project.

B. Refer to the project phasing schedule to outline dates and specific requirements.

C. Owner will separately contract for the following work *[unless specifically noted to be within the scope of this project]*:
   1. Loose Furnishings

D. Coordinate all aspects of Work by Owner as they interface with Work.

1.8 SPECIAL INSPECTIONS

A. None anticipated

1.9 APPLICABLE REFERENCES, CODES, AND PERMITS

A. References will be found in each section that applies to that section. In addition, Contractor shall comply with the Ohio Building Code requirements as they relate to the work.

B. Procure at Contractor's expense all necessary permits from municipal or other agencies and give all notices required. Fines levied due to non-compliance shall be paid by the contractor.
   1. RDA will apply for the applicable building permits with City of Moraine.

1.10 WAGES

A. This project <u>is subject</u> to prevailing wage and/or reporting requirements.

B. Certified Payroll Reports will be required.

C. Employee interviews to confirm compliance with the prevailing wage requirements may be accomplished at any time by the Owner. Contractor shall not obstruct or otherwise prevent employee interviews.

1.11 TAXES

A. Any taxes paid by the contractor will be considered their expense for which no compensation will be made by the Owner. [Tax Exempt Project].

B. Owner will provide Tax Exempt forms upon request.

1.12 SMOKING

A. Smoking is not permitted on the property – inside or outside of any facility.

B. Contractor or crewmembers found to be smoking will be subject to a $500 fine per occurrence. Any habitual offenders will be dismissed from the project site.

1.13 CONTRACTOR / GENERAL REQUIREMENTS

A. Visit the project sites to verify general and pertinent conditions and take measurements necessary for bidding purposes.

B. Failure to show or mention petty details shall not be warranted for the omission of anything necessary for the proper completion of the work.

C. Do not take advantage of any clerical errors, omissions, contradictions, or conflicts that may develop in plans, specifications, or details. Such errors, ambiguities and discrepancies shall be reported to the Architect immediately for clarification, revision, or correction prior to the submission of bids. If no notification is given, it shall be assumed that all specifications and conditions will be met.

D. Remain in compliance with all OSHA STANDARD 1926 – REGULATIONS FOR CONSTRUCTION at all times during project. Comply with all applicable Safe Work Practices.

E. Contract Period
   1. If an extension of time is necessary, a request in writing must be submitted to the Owner at least [14] days prior to the contract completion date.
   2. Notify the Architect, in writing, upon determination of any delay in material delivery.

F. Security: Contractor's Liability for Vandalism
   1. Secure and protect the project which is under the control of the Contractor. Include all such expenses for the securement and protection of the project and for the repair and replacement of the work until that portion of the work is accepted as complete by the Owner. Take all measures necessary to provide such security.

G. Qualifying Contractors and Sub-Contractors: The Owner may require the contractor/sub-contractor to provide references of similar projects, past performance, financial disclosures, etc. in the interest of selection of the lowest and best bidder for the project.
   1. The Contractor is responsible for all work performed by Sub-Contractors.
   2. The Owner has the final authority to request a particular sub-contract not be engaged in the project. If this occurs, The Owner and Contractor shall determine if there is an impact to the Contract amount, and negotiate, if necessary, to an adjustment in the Contract amount.
      a. No change to the Contract amount will be permitted if there is a change to the sub-contractor due to them utilizing alternate manufacturers or products that were not approved substitution requests.

1.14 SPECIFICATION CONVENTIONS

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

1.15 APPLICATIONS FOR PAYMENT

A. Refer to Section 01 29 00.

1.16 CHANGE PROCEDURES

A. Architect or Owner may issue a Construction Bulletin / Proposal Request including a detailed description of proposed change with supplementary or revised Drawings and specifications, a

change in Contract Time for executing the change. Contractor will prepare and submit estimate within seven [7] days.

B. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation.

C. Change Order Forms: AIA G701.
   1. On Owner's approval of a proposal from Contractor, RDA will issue a signed change proposal for items expended from the project allowances or a Change Order for all changes to Contract Sum and for all changes to the Contract Time.

D. Correlation Of Contractor Submittals:
   1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
   2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
   3. Promptly enter changes in Project Record Documents.

E. Architect will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on a Construction Bulletin. Provide a no cost change proposal for such items.

F. Important: All change orders must be fully executed prior to beginning any work. Failure to comply will result in Contractor request being denied and completed at no cost to the Owner.

G. Maximum mark up for overhead and profit on change orders shall be 15%.

1.17 UNIT PRICES

A. Architect / Owner will take measurements and compute quantities accordingly. Provide and assist in taking of measurements.

B. Unit Price Schedule: None

C. Unit Price includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services, and incidentals; erection, application or installation of item of the Work; overhead and profit.

D. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Architect multiplied by unit price for Work incorporated in or made necessary by the Work.

1.18 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option.

B. Coordinate related Work and modify surrounding Work as required.

C. Schedule of Alternates:
   1. None

1.19 COORDINATION

A. Coordinate scheduling, submittals, and Work of various sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as

closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.20 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturer’s instructions.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Architect / Owner before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.21 TOLERANCES

A. Monitor fabrication and installation tolerance control of installed Products over suppliers, manufacturers, Products, site conditions, and workmanship, to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply fully with manufacturer’s tolerances.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.22 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standards by date of issue current as of date of Contract Documents.

C. When specified reference standard conflicts with Contract Documents, request clarification from Architect / Owner before proceeding.

1.23 LABELING

A. Attach label from agency approved by authority having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label.
   1. Model number.
   2. Serial number.

3. Performance characteristics.

1.24 PRECONSTRUCTION MEETING

A. Architect / Owner will schedule preconstruction meeting after Notice of Award for affected parties.

B. Attendance: Architect, Owner, Contractor Project Manager, Superintendent / Foreman shall be in attendance.

C. Agenda:
1. Scheduling of construction events, set-up, storage and etc.
2. Project personnel with contact information.
3. Sequence of construction, starting points, events and required resources.
4. Subcontractors list with contact information.
5. Temporary utilities.
6. Inspection and acceptance of existing conditions.
7. Owner's requirements.
8. Project Safety.

1.25 PROGRESS MEETINGS

A. Architect will be providing periodic observation of the work throughout construction.
1. Architect will issue field reports at each site visit.
2. Architect will be observing the work for compliance with the specifications and will not be responsible for the ways, means and methods of constructing the project or managing the day to day operations.

B. Schedule and administer progress meetings throughout the project at bi-weekly intervals.

C. Agenda:
1. Review of work progress and Owner's Requirements.
2. Field Observations of the completed work.
3. Identification of any problems and associated solutions.
4. Proposed changes.
5. Administrative issues – payment applications, change orders, etc.

D. Architect will record meeting minutes and will issue to the project team.

1.26 PRE-INSTALLATION MEETINGS

A. Determine any and all necessary pre-installation meetings and shall schedule the same.

B. When required in individual Specification Sections, convene preinstallation meetings at Project Site one week before starting Work of specific Section.

C. Require attendance of parties directly affecting, or affected by, Work of specific Section.

D. Prepare agenda and preside over meeting:

E. Review conditions of installation, preparation, and installation procedures.

F. Review coordination with related Work.

G. Record minutes and distribute to participants after meeting, and those affected by decisions made.

1.27 CONTRACT ADMINISTRATION

A. Architect is providing contract administration services for this project to the Owner. However, it shall be the responsibility of the Contractor and Owner to coordinate the proposed work, schedules, installations, permits, inspections, etc. as the Architect is not on-site every day.

B. Contact the Architect for clarification should there be questions regarding the interpretation or intent of the documents, field discovery, etc. that would impact or affect the work as proposed. Architect shall not be liable for deviations, field changes, and Owner changes during construction.

C. Field confirm all existing conditions, proposed installations and how they interface to ensure the systems can be installed per the intent of the documents and to meet applicable building and zoning codes, local requirements, Owner requirements, provide a watertight detail, meet aesthetic requirements, etc.

D. Meet all applicable building and zoning codes requirements whether specifically noted herein or not. Building codes represent the minimum acceptable standard, bid documents may represent additional work or higher quality than the minimum.

E. Install all products, materials, installations, and the like in accordance with applicable industry standards, applicable manufacturer's details and instructions, in accordance with best practices, and building code provisions. The manufacturer details / requirements are the minimum acceptable standard, bid documents may require additional work.

1.28 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching new Work; restore Work with new Products.

B. Submit written request in advance of cutting or altering elements affecting:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching [including excavation and fill,] to complete Work, and to:
   1. Fit several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and non-conforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill. Restore Work with new Products in accordance with requirements of Contract Documents.

F. Fit Work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated materials, to full thickness of penetrated element. Follow applicable UL assemblies.

J. Refinish surfaces to match adjacent finishes.
   1. For continuous surfaces, refinish to the nearest intersection; for assembly, refinish entire unit.
   2. For painted surfaces, paint entire wall from corner to corner, floor to ceiling.

K. Identify hazardous substances or conditions exposed during the Work to RDA for decision or remedy.

1.29 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial progress schedule in duplicate within 5 days after date of Owner-Contractor Agreement for Architect/Engineer review.

B. Prepare progress schedule using a bar chart of Critical Path chart to outline work and interrelated components.

C. Submit revised schedules as appropriate throughout the duration of the project.

D. Submit implementation plan indicating planned progress, sequencing, and order of operations.

1.30 SUBMITTAL PROCEDURES

A. Refer to Section 01 33 00.

1.31 MOCK-UPS

A. Accomplish mockups as directed by the Architect / Owner.

B. Accepted mock-ups are representative of quality required for the Work.

C. Where mock-up has been accepted by Architect / Owner and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.32 TEMPORARY UTILITIES

A. Owner will pay for the cost of temporary utilities throughout the duration of the project.

B. Utilize existing utilities at the building as required to facilitate work. Maintain existing utilities operational throughout the duration of the project.
   1. If systems need to be out of services, schedule this work for off-hours, coordinate with Owner.

C. Provide temporary lighting for construction operations as required by conditions and where existing lighting has been removed to facilitate work.

D. Provide temporary emergency egress and exit signage as required by conditions and where existing has been temporarily removed to facilitate work.

E. Coordinate with fire suppression and fire alarm system / monitoring company as applicable to facilitate work and accomplish modifications to the systems throughout the duration of the project. Maintain existing systems operational.

1.33 TEMPORARY HEATING / COOLING / VENTILATION

A. Provide and maintain temporary heating / cooling as required to facilitate the project.
   1. Provide adequate protection against distribution of dust / dirt into the HVAC ductwork, exhaust, etc.
   2. Do not let dust / dirt accumulate in the existing duct systems resultant from the project.

B. Provide and maintain filtration media [additional filters, charcoal filters, etc.] at all HVAC systems during the course of the project.

C. Shut down HVAC systems during dusty activities.

D. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.34 TEMPORARY SANITARY FACILITIES

A. Provide any and all necessary portable toilet facilities at the project site as applicable to the work. Owner facilities may not be utilized without Owner approval.
   1. Protect portable toilet facilities from vandalism.

1.35 TEMPORARY BARRICADES

A. Erect temporary barricades as applicable to the work to maintain security, dust control, etc.
   1. Minimum requirement of barricades: polyethylene zip walls, etc. as required to maintain dust control and/or limit access. Metal stud / gypsum board barricades may be required at certain areas in public facing spaces. Coordinate with Owner. Exact locations and type of barricade to be approved by Owner prior to installation.

B. Provide all applicable signage to limit non-construction personnel from entering the construction area.

1.36 STAGING AREA / MATERIAL STORAGE

A. Coordinate with Owner on acceptable location of project staging and material storage area.

B. Do not anticipate any space for storage of materials in the building / work areas or adjacent building areas.

C. Provide secured, portable storage containers for the temporary storage materials, fixtures, and equipment, etc. as required for the duration of the project. Coordinate location of storage containers with Owner. Protect / restore site as applicable to the conditions to original conditions.

D. Owner will make reasonable effort to provide suitable space on the site for the Contractor to set up operations. Moving from this space may be necessary when instructed by the Owner and shall be accomplished without charge to the Owner. Cooperate with Owner to minimize conflict from Owner's operations.

E. Enclose exterior project staging area, if provided, with a minimum of a 6' high chain link fence to the satisfaction of the Owner.

1.37 FIELD OFFICE

A. Owner will attempt to make space available for the Contractor / Project Team use over the course of the project. Relocate if directed by Owner or as required by work.

1.38 PARKING

A. Park Contractor vehicles in areas designated by the Owner.

B. Do not block access to existing parking lots with construction equipment, material laydown, or storage areas.

C. Do not block access to fire apparatus, ingress and egress

1.39 PROGRESS CLEANING AND WASTE REMOVAL

A. Collect and maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition to the satisfaction of the Owner. Clean up shall occur on a daily basis.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.

C. Failure to provide routine and daily cleanup may result in a back charge from the Owner to accomplish this work.

D. Provide dumpsters or trash containers needed for the proper removal of project materials, trash, or debris related to the Work. Keep all work areas and project sites neat and free of trash and clutter at all times. Take all considerations for safety.

1.40 FIRE PREVENTION FACILITIES

A. Establish fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

B. Portable Fire Extinguishers: NFPA 10; 10 pound capacity, 4A-60B: C UL rating.
   1. Provide one fire extinguisher at each project site during work operations.
   2. Supplement as necessary per the local fire department requirements for construction operations.

1.41 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Protect finished pavement, concrete, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Prohibit traffic or storage upon waterproofed or roofed surfaces, finished surfaces, etc as is applicable to the work. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer and provide all required protection as determined necessary. Any damage caused shall be repaired to like new condition.

E. Prohibit traffic from landscaped areas.

1.42 DUST CONTROL

A. Execute work by methods to minimize raising dust from Construction operations.

B. Provide positive means to prevent air-borne dust from dispensing into atmosphere and to other areas of the project as applicable.

C. Provide temporary visqueen dust control measures to minimize the spread of dust and debris. Provide drop cloths, protective coverings as necessary.

D. Provide protection of existing HVAC / distribution systems.

1.43 POLLUTION AND ENVIRONMENTAL CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

B. Provide dust control, erosion and sediment control, etc. to allow for proper execution of the Work.

C. Provide protective coverings, etc. as necessary to protect work.

1.44 DELIVERY, HANDLING, STORAGE, AND PROTECTION

A. Deliver, handle, store, and protect Products in accordance with manufacturer's instructions.

B. Contractor shall be responsible for storage and safekeeping of all materials, including company’s personal property. All damaged materials shall be removed from the site.

C. Coordinate material delivery to avoid Owner involvement.

1.45 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.
   1. Clean cabinets, fixtures, equipment.

2. Clean glazing [new and existing].
3. Vacuum carpeted and soft surfaces.

C. Replace filters of existing operating equipment.

D. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.46 STARTING OF SYSTEMS

A. Provide seven [7] days notification prior to start-up of each item.

B. Ensure each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturer's instructions.

D. Submit written report stating equipment or system has been properly installed and is functioning correctly.

1.47 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment location.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
1. Prepare and insert additional data into the operations and maintenance manuals when the need for additional data becomes apparent during instruction.

1.48 TESTING, ADJUSTING, AND BALANCING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

B. Retain services of independent firm to perform testing, adjusting, and balancing. Include the cost for these services in the bid amount.
1. Reports will be submitted by independent firm to Architect / Owner indicating observations and results of tests and indicating compliance or non-compliance with specified requirements and with requirements of Contract Documents.

C. Cooperate with independent firm; furnish assistance as requested. Make adjustments to systems to be in compliance with Contract Documents at no additional cost to Owner.

D. Re-testing required because of non-conformance to specified requirements is the responsibility of the Contractor.

1.49 CLOSE OUT PROCEDURES

A. Refer to Section 01 77 00

1.50 PROJECT RECORD DOCUMENTS

A. Refer to Section 01 77 00

1.51 OPERATION AND MAINTENANCE DATA

A. Refer to Section 01 77 00.

1.52 WARRANTIES

A. Refer to Section 01 77 00.

PART 2 PRODUCTS

2.1 MANUFACTURED PRODUCTS

A. Where a particular system, product, or material is specified by name it shall be considered a standard and most satisfactory for its particular purpose. Any other product or material considered equal or better in all respects must be approved by the Architect prior to bidding.

B. All products used on this project shall be new, unless otherwise noted on the drawings or as specified herein.

2.2 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by the Contract Documents.

C. Provide interchangeable components of same manufacturer for components being replaced.

2.3 LABELING

A. Attach label from agency approved by Authority having Jurisdiction for products, assemblies, and systems required to be labeled by Applicable Code.

B. Label information: include manufacturer’s or fabricator’s identification, approved agency information, and the following information, as applicable, on each label.
   1. Model number
   2. Serial number
   3. Performance characteristics

2.4 DELIVERY, HANDLING, STORAGE, AND PROTECTION

A. Deliver, handle, store, and protect Products in accordance with manufacturer's instructions.

B. Manage and be responsible for storage and safekeeping of all materials, including company’s personal property. All damaged materials shall be removed from the site.

C. Coordinate material delivery to avoid Owner involvement.

D. Locations of ground level storage and waste dumpster must be approved by the Owner.

E. Properly secure all materials to prevent blow over / blow off during weather / wind events, etc.

2.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit request for substitution for manufacturers not named.

2.6 SUBSTITUTIONS

A. Refer to Section 01 25 00.

2.7 EXTRA MATERIALS

A. Provide attic stock of finish materials totaling 5% [or as noted below] of the total installation.
   1. Each finish floor type
   2. Each finish base type
   3. Each acoustic ceiling tile type – 3%

B. Provide minimum of [1] gallon of each finish paint color.

C. Coordinate turnover of extra materials to Owner, assist in placing materials in a location suitable to the Owner.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. **Beginning new Work means acceptance of existing/job-site conditions.**

B. Verify utility services are available, of correct characteristics, and in correct location.

C. Contact OUPS a minimum of 48 hours prior to beginning work to verify location of existing utilities, coordinate requirements as applicable.
   1. Contact private utility locating services as required by the conditions. It is the Contractor's responsibility to locate all public and private utilities that may be impacted by the work.

3.2 FIELD VERIFICATION

A. Prior to ordering materials, verify the actual dimensions of existing conditions and assume responsibility for workable solutions for all new work. Verification that the new work and items are workable for existing conditions while providing adequate clearances is the responsibility of the Contractor.

3.3 PROTECTION

A. Accomplish all work in accordance with the provision of Federal, State American Standard Safety Code for Building Construction and OHSA safety requirements.
   1. Implement and be responsible for protective railings and guards, tie-offs, fall protection, and other safety measures as required by OSHA, even if not specified.
   2. Fall protection is required.
   3. Architect / Owner is not a safety consultant and as such does not direct the means and methods of compliance with safety regulations.

B. Protect and maintain all building entrances, interior contents, building exterior and grounds.
   1. Return all surfaces to their original condition after all work is complete.

C. Replace/repair the damages caused by any type of improper protection [including interior or exterior equipment] at no expense to the Owner.

D. Comply with all regulations of the Local Fire Department and the Owner's requirement regarding storage and handling of flammable materials, etc. It is the responsibility of the Contractor performing any hot /torch work to comply with the safety provisions of the National Fire Codes pertaining to such work and the Contractor shall be responsible for all damage or fines resulting from failure to so comply.

3.4 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.5 JOB SUPERINTENDENT/EMPLOYEES

A. Each prime contractor shall have a qualified foreman on the project at all times when work is being accomplished.

B. Refrain from fraternization with building occupants other than specifically designated Owner's representatives.

C. Furnish the Owner with a list of personnel with phone numbers that will be working on the project and emergency contacts names and numbers that has the authority to handle emergencies on a 24 hour/seven days a week.

3.6 SAFETY PROGRAM

A. Develop, implement, and maintain a written safety program for all operations/ work performed on this project. Keep these documents at the job site and make available to the Architect / Owner upon request.

B. Assume all responsibility for project safety, ways, and means and methods of constructing the project. Engage safety consultant as may be necessary for the execution of the work.

C. In addition, the Owner may require special safety requirements to be performed by the Contractor, these requirements will be provided prior to commencement of work.

3.7 REMOVALS AND CLEANUP

A. Remove and demolish of items that are required for proper completion of the work as applicable in each section. All debris resulting from the work not designated for reuse becomes the property of the Contractor unless stated otherwise.

B. Keep all work areas and project sites neat and free of trash and clutter at all times.

C. Maintain the work areas, including all subcontractor's work, clean of all debris to the satisfaction of the Owner at the completion of each work day [daily cleanup].

D. Provide dumpsters or trash containers needed for the proper removal of project materials, trash, or debris related to the work.
   1. No Debris, materials, etc. may be left unprotected on the grounds.
   2. All exterior staging / dumpster areas must be fenced / protected.

3.8 SPECIAL PROCEDURES

A. Materials: As specified in product sections; match existing with new products for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to permit installation of new work and finishes.

G. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original or specified condition.

H. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with neat transition to adjacent finishes.

I. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

J. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect for review.

K. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

L. Finish surfaces as specified in individual product sections.

3.9 GENERAL PROJECT REQUIREMENTS

A. Equipment delivery and equipment staging must be coordinated with Owner prior to start of project.

B. Safety is paramount and all personnel on site must wear appropriate personal protection equipment [PPE]. The Contractor is responsible for means and methods to ensure that proper PPE is provided. Failure to comply may result in dismissal from site.

C. Barricade work area with appropriate construction grade barriers to establish boundaries of work area and assure safety for all workers and general public. All work areas must be properly barricaded from the general public prior to starting any work.

D. Maintain job site in an orderly and neat fashion at all times.

E. Contractor will pre-determine work phases with Owner to minimize disruption of business operations.

F. IMPORTANT: Failure to show or mention petty details shall not be warranted for the omission of anything necessary for the proper completion of the work.

G. The plans and specifications are intended to depict the general scope, layout and quality of workmanship required. The documents are not an "instruction manual" to execute the work nor are they intended to show or describe in detail every item necessary for the proper installation of the work. The means and methods required to execute the work described is the sole responsibility of the Contractor. The Contractor shall include the ancillary work required, whether explicitly stated or not, for the proper completion of the work as intended. The Contractor is required to meet or exceed building code requirements, applicable industry standards, ASTM standards, and/or manufacturer installation requirements as they relate to the work.

H. The plans and specifications represent a single complete design package indicating the intended scope of the project in its entirety. As such, the project is structured to be awarded to a single Prime Contractor. The documents do not delineate bid packages or assign responsibilities to any subsequent subcontractors, dictate construction sequencing, nor provide coordination between any "trades". Such activities are the responsibility of the holder of the construction contract. In the event of a discrepancy within the drawings or between the drawings and the specifications, the more stringent requirement represented in the documents shall prevail.

I. Do not take advantage of any clerical errors, omissions, contradictions, or conflicts that may develop in plans, specifications, or details. Such errors, ambiguities and discrepancies shall be reported to the Architect immediately for clarification, revision, or correction prior to the submission of bids. If no notification is given, it shall be assumed that all specifications and conditions will be met.

END OF SECTION

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SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Section 00 23 13, Instructions to Bidders shall apply to this section.

1.2 WORK INCLUDES

A. Includes administration and procedural requirement for Substitutions.
   1. Substitutions' for Cause: Changes due to project conditions, such as unavailable of product.
   2. Substitutions' for Convenience: Changes that may offer advantages to the Owner.

1.3 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions / Approved Equal: Submit request for substitution as outlined in this section for manufacturers not named.
   1. RDA/Owner is the decision maker if the proposed "approved equal" is in fact equal and approved. Any decision rendered is final.
   2. Any Contractor, Sub-contractor, or Supplier who makes their own judgement as to "approved equal" and includes within their bid without a formal approval is doing so at their own risk.

1.4 SUBSTITUTIONS PROCEDURES

A. RDA will consider requests for Substitutions by the Bidder only [not materials suppliers, etc].

B. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

C. A request constitutes a representation that the Bidder:
   1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
   2. Will provide same warranty for Substitution as for specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.

D. Substitution Procedure
   1. **Submit copy of request for Substitution for consideration to RDA no later than 7 days before bid opening date**.
   2. Submit shop drawings, product data, and applicable certified test results attesting to proposed product equivalence. Burden on proof is on proposer.
   3. RDA will notify Contractor in writing of decision to accept or reject request within 5 days of receipt of request or request additional information or documentation for evaluation.

E. Substitutions will not be considered when they are indicated or implied on Submittals, without written request or when acceptance will require revision to the Contract Documents.

F. If the Substitution will require modifications to the Contract / Bidding Documents, the cost for updating the documents shall be paid by the Contractor making the request.

G. Substitutions will not be considered after award of the project without justification.

H. Approved substitutions will be identified by Addenda.
   1. Bidders shall not rely upon approvals made in any other manner.

END OF SECTION

SECTION 01 29 00 – PAYMENT PROCEDURES

PART 1 GENERAL

1.1 WORK INCLUDES

A. Includes administration and procedural requirement for necessary to prepare and process Application for Payment.

1.2 SCHEDULE OF VALUES

A. Submit schedule on AIA Form G703.
   1. Provide line items for each applicable CSI division / defined work scope such that the Owner and RDA can review and determine/confirm progress.
   2. Include line items for each allowance, alternates [as applicable], and general conditions.

B. Submit Schedule of Values in duplicate within 5 days after date of Owner-Contractor Agreement.

1.3 APPLICATIONS FOR PAYMENT

A. Use AIA form G702 and G703 for Application for payment or a form the Owner has requested.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Complete every entry, notarize and execute by a person authorized to sign document on behalf of the contractor. Include amounts for work completed following previous Application for Payment whether or not payment has been received, include amounts of Change Orders issued before last day of construction period covered by application.
   1. Stored materials included in application must have supporting documentation that verifies amount required, do not include overhead and profit on stored material.
   2. Submit to RDA for review and processing.
      a. E-mail submittal is acceptable unless otherwise directed by the Owner. Verify hard copies with Owner if required.

D. Each application for payment following the initial Application for Payments shall be consistent for payment with previous applications.

1.4 RETAINAGE

A. Retainage in the amount of 10% will be withheld from progress payments during the course of the project.

B. Refer to the Supplementary Conditions to the AIA-A104 Owner-Contractor Agreement.

1.5 PREVAILING WAGE / PAYROLL REPORTS

A. Submit certified payroll reports for each contractor [General Contractor and all Subcontractors] with each payment application. Payroll reports shall be et up on a weekly basis.

1.6 SUBMITTAL PROCEDURES

A. Submit [1] copy of each payment application on AIA Form G702 and G703, in PDF format
   1. Pencil copy to RDA for review/acceptance. RDA will review and provide any comments or questions.
   2. Submit final payment application in PDF format to RDA for processing.
   3. RDA will certify and process the payment application and will forward to Owner for payment.

B. Submit all required waivers of lien / partial release of lien [including vendors and subcontractors as requested by Owner], payroll reports, etc. as required by the Owner. Failure to submit required paperwork can delay processing of Application for Payment.

1.7 FINAL APPLICATION FOR PAYMENT

A. Refer to provisions in Section 01 77 00 for Application for Payment at Substantial Completion.

END OF SECTION

SECTION 01 33 00 – SUBMITTALS

PART 1 GENERAL

1.1 WORK INCLUDES

A. Review of shop drawings and product data by RDA / Owner.

1.2 SUBMITTAL PROCEDURES

A. Contractor to submit product data and shop drawings for all applicable components of the project. Refer to individual sections for additional requirements.
   1. Contractor to provide a submittal log at the beginning of the project for review by RDA / Owner. Submittal log shall identify proposed submittals by Spec Section.
   2. RDA review of the submittals will be general in nature and does not relieve the Contractor in any way of the responsibility in compliance with the contract requirements, manufacturer requirements, and/or applicable codes.

B. Submittals shall be accomplished in a digital [PDF format].
   1. Any hard copies received will be scanned and returned electronically.
   2. Provide those submittals required to maintain orderly progress of the work and those required for early lead time for manufacturer fabrication.
   3. Mark each component to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this project. Non-identified submittals will be rejected.

C. Submittals shall have a Submittal form / cover sheet to identify Project, Contractor, subcontractor or supplier; and pertinent Contract Document references.

D. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

E. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of completed Work.

F. Revise and resubmit submittals as required; identify changes made since previous submittal.

G. All submittals shall be accomplished at the beginning of the project to allow the proper ordering of materials for the project.
   1. Failure by the Contractor to provide submittals in a timely fashion does not change the project start date nor contract period.

H. Any materials on the job site that have not been reviewed as part of the submittal process are subject to rejection / removal from the job-site. Any work undertaken without review of the submittal data is at the Contractor's risk and subject to rejection or replacement at no cost to the Owner if submittals are not in conformance with the project documents.

I. Allow 7 days for review of submittal items.

1.3 SUBMITTALS / PRODUCT DATA / SHOP DRAWINGS

A. Product Data/Shop Drawings:
   1. Submitted to RDA for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
   2. All shop drawings shall be to scale, submit drawings on sheets no larger than 24-inch x 36 inch, all other product data can be on 8 ½ X 11-inch sheets.

B. Samples for Review:
   1. Submitted to RDA for review and selection for aesthetic, color, or finish.

2. Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns for Owners selection.
3. Submit samples to illustrate functional and aesthetic characteristics of Product.

C. Personnel/Other Contractors
1. Submit a list of all subcontractors and on-site personnel with the list of lead contact and associated phone numbers.
2. Submit emergency contact sheet with contacts for an emergency – 24/7 call list.

D. Contract Items:
1. Submit Certificate of Insurance, Worker's Comp Certificates as required by Owner.
2. Submit bonds if applicable to the contract.
3. Submit a written Construction Schedule / Implementation and Sequencing Plan outlining starting points and length of time to complete work in each section.

E. Safety Data Sheets: Submit Safety Data Sheets [SDS] on all products to the Owner.
1. Owner shall be responsible to provide to employees as applicable.
2. Owner's representative /RDA does not review / approve any SDS sheets.

F. Site Specific Safety Plan
1. Provide to Owner for their Review.

G. Site Logistics Plan
1. Provide to Owner for their Review.

1.4 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturer printed instructions for delivery, storage, assembly, installation, [start-up,] adjusting, and finishing, in quantities specified for Product Data.

1.5 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit certifications by manufacturer to Owner, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 WORK INCLUDES

A. Close-out of the actual work, including warranties, maintenance manuals and final cleaning. Close-out of all contract obligations.

1.2 CLOSE-OUT PROCEDURES

A. Contractor shall notify Owner 7 days prior to the work being complete to establish the desired inspection date. Owner / RDA will either proceed with the inspection or notify Contractor of unfulfilled requirements.

B. Owner / RDA shall inspect the completed project and notify the Contractor of any deficiencies. Deficiencies will form 'punch list' for final acceptance.

1.3 PUNCHLIST REQUIREMENTS

A. The Contractor shall review and inspect all work prior to notifying the Owner for a Punchlist inspection of the work. Provide written documentation certifying review along with documentation of Contractor generated Punchlist.

B. If work is clearly not complete, the Punchlist will be suspended until such time that it is evident that the Contractor has completed and reviewed/inspected their own work.

1. RDA anticipates up to [1] punchlist inspection and [1] back-punch / final inspection as part of our services to the Owner.
2. Failures by the Contractor to complete the work, complete punchlists, etc. may result in a backcharge to the Contractor for the additional time to closeout the project.

C. The Contractor shall review and provide the noted repairs and corrective work necessary at each of the Punchlist inspections to allow project close out.

1. Back-punch walk through may result in additional punchlist items which need to be addressed by the Contractor.

D. The Contractor shall provide adequate time in the construction schedule to accomplish punchout work within the overall contract period indicated within the bid documents.

E. The failure to identify any punchlist item during a walk through / inspection does not release the Contractor from contractual responsibility to address any item during the warranty period.

1.4 SUBSTANTIAL COMPLETION

A. If Requested by the owner, a Certificate of Substantial Completion will be issued upon completion of all the work as required.

1.5 PREREQUISITIES TO FINAL ACCEPTANCE AND PAYMENT

A. Prior to acceptance and final payment, all claims or disputes must have been resolved and the Contractor must have provided the following items to the Owner:

1. Notarized affidavit of waiver of liens [contractor of record], sub-contractors and material suppliers
2. Certificates of release from authorities having jurisdiction over permitting.
3. Final statement of charges [100% application for payment].
    a. Submit a final Application for Payment according to Section 01 29 00, Payment Procedures.
4. Documented evidence of completing 'punch list' as applicable.
5. Manufacturer's original warranties, including contractor maintenance agreements and warranties as applicable.
6. Evidence that claims have been settled.

7. O+M Manuals
8. Manufacturer's maintenance and repair instructions.
9. Record Drawings.
10. Final cleaning of all work areas.
11. Restore all work staging and lay-out areas to pre-construction conditions, including but not limited to, removal of debris, temporary facilities, grading and grass seeding and cleaning or repair of impacted structures.

1.6 PHOTOGRAPHIC DOCUMENTATION

A. When requested by the Owner, photos of the completed punch list along with any supporting documentation can be submitted, in lieu of a final walkthrough.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of Contract Documents to be utilized for record documents.

B. Record actual revisions to the Work. Record information concurrent with construction progress.

C. Specifications: Legibly mark and record at each Product section description of actual Products installed.

D. Record Documents and Shop Drawings: Legibly mark each item to record actual construction.

E. Submit documents to Owner.

1.8 PROJECT WARRANTIES

A. All work undertaken as part of the project shall be warranted for a period of not less than [1] year. Individual sections / products may have specific additional warranty requirements.

B. Provide notarized copies of warranty documents to the Owner.
   1. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.

C. Original warranties are required to be provided to the Owner prior to final payment.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit two sets prior to or at the final inspection, bound in 8-1/2 x 11-inch text pages, binder covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.

C. Internally subdivide binder contents with permanent page dividers, logically organized, with tab titles legibly printed under reinforced laminated plastic tabs.

D. Contents:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, subcontractors, and major equipment suppliers.
   2. Part 2: Permit and Inspection information
   3. Part 3: Project submittals, organized by CSI division
      a. Include applicable product warranties with individual sections / submittals
   4. Part 4: Operation and maintenance instructions, arranged by system / CSI division.
   5. Part 5: Project documents and certificates.
   6. Part 6: Colors / finishes / samples

1.10 FINAL CLEANING AND SITE REPAIR

A. Final cleaning of all work areas:
   1. Execute final cleaning prior to final inspection.

2. Clean interior and exterior surfaces exposed to view. Vacuum carpeted and soft surfaces.
3. Clean interiors of all cabinetry.
4. Clean all fixtures and finishes.
5. Replace filters of operating equipment.
6. Remove waste and surplus materials, rubbish, and construction facilities from site.

B. Restore all work staging and lay-out areas to pre-construction conditions, including but not limited to, removal of debris, temporary facilities, grading and grass seeding and cleaning or repair of impacted structures.

END OF SECTION

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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolishing designated building equipment and fixtures.
   2. Demolishing designated construction.
   3. Cutting and alterations for completion of the Work.
   4. Removing designated items.
   5. Protecting items designated to remain.
   6. Removing demolished materials.

1.2 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of capped utilities, concealed utilities, subsurface obstructions, and any other documentation necessary for future reference.

1.3 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection.

B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.

C. Obtain required permits from authorities having jurisdiction.

1.4 SCHEDULING

A. Schedule Work to coincide with proposed alterations and improvements.

B. Coordinate Work with Work by Others and Work by Owner as needed.

C. Coordinate utility and building service interruptions with Owner.
   1. Do not disable or disrupt fire alarm or life safety systems without approval from the Owner and Fire Department and/or Building Official. Coordinate requirements as needed.

1.5 PROJECT CONDITIONS

A. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Mark location and termination of utilities.

C. Erect, and maintain temporary barriers and security devices including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.

D. Erect and maintain weatherproof closures for exterior openings as applicable to work/scope.

E. Erect and maintain temporary partitions.

F. Prevent movement of structure; provide temporary bracing and shoring as required.

G. Provide appropriate temporary signage.

H. Do not close or obstruct building egress path.

I. Do not disable or disrupt building fire or life safety systems without **three** days prior written notice to Owner. Coordinate with Fire Department / Building Official.

3.2 SALVAGE REQUIREMENTS

A. Coordinate any applicable items to be salvaged with Owner.

B. Protect designated salvage items.

C. Package small and loose parts.

D. Deliver salvaged items to Owner.

3.3 DEMOLITION

A. Provide all selective demolition and removals necessary for the proposed alterations. Field coordinate all conditions with the design intent on the drawings.
   1. Drawings are diagrammatic and may not reflect the full extent of demolition / removals required to accomplish the proposed scope of work.
   2. Coordinate design intent and verify that all demolition work and restoration / repair work required is included in the scope of the project, regardless of specifically being noted on the drawings.

B. Minimize interference with adjacent and occupied building areas.

C. Maintain protected egress from and access to adjacent building areas.

D. Cease operations immediately when structure appears to be in danger and notify Architect.

E. Disconnect and remove utilities within demolition areas, refer to Drawings.

F. Cap and identify abandoned utilities at termination points when utility is not completely removed.

G. Protect existing improvements.

H. Carefully remove building components indicated to be Reused:

I. Remove demolished materials from Site except where noted otherwise. Do not burn or bury materials on Site. Provide the proper removal and/or all required dumpsters for the project.

J. Remove materials as Work progresses.

K. Upon completion of Work, leave areas in clean condition.

L. Remove temporary Work.

3.4 CLEAN UP

A. Remove demolished materials from site as work progresses.

B. Leave areas of work in clean condition.

END OF SECTION

SECTION 03 01 00 - MAINTENANCE OF CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete surface repair.
   2. Concrete crack repair.

1.2 SUBMITTALS

A. Product Data: Submit product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.
   1. Concrete repair products.

B. Samples: Submit color samples for patches exposed to view in finished construction and required to match existing.

C. Manufacturer's Instructions: Submit mixing instructions.

1.3 MOCK-UP

A. Concrete Repair Products:
   1. Construct mockup panel illustrating patching method, color and texture of repair surface.
   2. Prepare one mockup of each type of patching/repair procedure.
   3. Locate where directed by Architect.
   4. Incorporate accepted mockup as part of Work.

B. Concrete Sealer:
   1. Construct mockup panel illustrating finished aesthetic and color.
   2. Prepare one mockup of each type of patching/repair procedure.
   3. Locate where directed by Architect.
   4. Incorporate accepted mockup as part of Work.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Follow manufacturer requirements for temperature and humidity prior to, during and after application.

PART 2 PRODUCTS

2.1 CONCRETE REPAIR PRODUCTS – BASIS OF DESIGN

2.2 BASIS OF DESIGN

A. General basis of design for all systems is SIKA, other manufacturers accepted provided bidder/contractor submission of complete technical data of proposed products/systems for review by Architect.

2.3 CONCRETE SELF-LEVELING UNDERLAYMENT MIX

A. Concrete Leveling Mix: one-component, fast drying, cementitious skim mortar ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level SkimCoat
   1. Flexural strength ASTM C-293: 1,300 psi at 28 days.
   2. Compressive strength ASTM C-109: 3,700 psi at 28 days

B. Concrete Leveling Mix: one-component, polymer modified, self-leveling underlayment ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level-125
   1. Flexural strength ASTM C-293: 1,150 psi at 28 days.
   2. Compressive strength ASTM C-109: 4,000 psi at 28 days

C. Concrete Leveling Mix: one-component, cementitious underlayment, self-leveling underlayment ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level-325
   1. Flexural strength ASTM C-293: 1,500 psi at 28 days.
   2. Compressive strength ASTM C-109: 5,300 psi at 28 days

2.4 CONCRETE REPAIR / CEMENTITIOUS MORTAR –PARTIAL DEPTH REPAIRS

A. Concrete Repair/Patch Cementitious Mortar: one-component, rapid hardening [ASTM C-928], early strength gaining, cementitious mix for repairs on horizontal surfaces.
   1. Flexural strength ASTM C-293: 1,000 psi at 28 days.
   2. Bond strength ASTM C-882: 2,500 psi at 28 days,
   3. Compressive strength ASTM C-109: 7,000 psi at 28 days

B. Sika, SikaQuick 1000 or Equal

PART 3 EXECUTION

3.1 REMOVALS

A. Remove all existing finish flooring – tile, VCT, epoxy paint, etc. from the existing concrete slabs. Remove/strip sealer from existing unfinished concrete slabs.

B. Prep existing concrete / substrate for new floor systems as specified.

3.2 EXAMINATION

A. Verify surfaces are ready to receive work.

B. Beginning of installation means acceptance of existing surfaces.

3.3 PREPARATION

A. Provide all temporary shoring and bracing as required for intended work.

B. Provide all required formwork, tools, and equipment as required for intended work.

C. Clean concrete surfaces of dirt, laitance, corrosion, or other contamination; wire brush using water; rinse surface and allow to dry.

D. Flush out cracks and voids with chemical solvent or water to remove laitance and dirt. Chemically neutralize by rinsing with water.

E. For areas patched with epoxy mortar, remove all broken and soft concrete. Remove corrosion from steel. Clean surfaces mechanically; wash with acid; rinse with water.

3.4 APPLICATION –CEMENTITIOUS MORTAR PARTIAL DEPTH REPAIR

A. Clean all surfaces of contaminants.
   1. Clean and prep all exposed reinforcing steel.
   2. Replace deteriorated reinforcing steel with new as indicated on the drawings.

B. Prime substrate in accordance with manufacturer requirements.

C. Mixing: mechanically mix per manufacturer requirements. Mix to a uniform consistency with a thorough mixing and proper proportioning of the two components.
   1. Add 3/8" course aggregate at desired quantity to uniform consistency as necessary.

D. Screed level.

E. Finish with float or light broom finish in accordance with approved mockup for desired finish texture.

F. Cure concrete per ACI recommendations using wet burlap, water mist,
   1. Do not use curing compounds for curing of concrete.

G. Avoid contact with aluminum materials to prevent adverse chemical reaction and possible failure of the repair. Insulate potential areas of contact by coating aluminum with epoxy.

3.5 APPLICATION – SELF-LEVELING MORTAR REPAIR

A. Prepare concrete by mechanical means, shot blast, sandblast, scarifying to achieve a matt, glaze free open textured surface.

B. Prime substrate in accordance with manufacturer requirements.

C. Mixing: mechanically mix per manufacturer requirements. Mix to a uniform consistency with a thorough mixing and proper proportioning of the two components.

D. Install in accordance with manufacturer requirements using a flat edge steel trowel.

E. Screed level.

3.6 SCHEDULE / GENERAL REPAIR SCOPE

A. Clean / prep all existing concrete slabs after removal of existing floor finishes.

B. Remove all existing surface coatings, adhesives, mortar, etc. and patch repairs.

C. Remove all existing spalling and previous repair areas/patches.

D. Apply cementitious repairs to all areas of affected surfaces and to level various areas of the concrete slab between spaces within the building.
   1. Intent of repairs is to provide a smooth, uniform, floor slab free of voids, divots, and other irregularities in the finish, ready for a new finish floor system. Repairs shall be from edge to edge, across the entire floor system without exception.
   2. Floor repairs shall be accomplished to the satisfaction of the finish floor manufacturer / system as specified. Contractor to coordinate all requirements, and provide scope for the same.

E. Apply sealant [Sika, Sikaflex 1A or Equal] to joints and cracks.

F. Prepare for new finishes to concrete surfaces as indicated.

END OF SECTION

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Formwork.
   2. Reinforcement and Accessories.
   3. Cast-in place concrete.
   4. Finishing and curing.

1.2 SYSTEM DESCRIPTION

A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 301 to conform to design and applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings or required by proposed work.

B. Vapor Retarder Permeance: Maximum 1 perm when tested in accordance with ASTM E96/E96M, water method.

1.3 SUBMITTALS

A. Design Data: Submit mix designs, admixtures, reinforcement, and anchors.

1.4 QUALITY ASSURANCE

A. Construct and erect concrete formwork, reinforcing, and cast-in-place concrete in accordance with ACI 301.

PART 2 PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES

A. Form Materials: At discretion of Contractor.

B. Form Release Agent: Colorless mineral oil not capable of staining concrete or impairing natural bonding characteristics of coating intended for use on concrete.

C. Slab Edge Joint Filler: ASTM D1751, Premolded asphaltic board, 1/2 inch thick. As applicable to conditions.

D. Vapor Retarder: ASTM E1745 Class A; 10 mil thick clear polyethylene film; type recommended for below grade application. Furnish joint tape recommended by manufacturer.

2.2 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, plain and/or deformed billet bars to suit condition and application, uncoated finish.

B. Welded Plain Wire Fabric: ASTM A185/A185M; in flat sheets; unfinished.

C. Fabricate concrete reinforcement in accordance with ACI 301.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150, Normal-Type I Portland type.

B. Fine and Coarse Aggregates: ASTM C33.

C. Lightweight Concrete Aggregate: ASTM C330

D. Water: Clean and not detrimental to concrete.

E. Air Entrainment Admixture: ASTM C260.

F. Fiber Mesh Reinforcing: ASTM 1116-C.

G. Bonding Agent: Latex emulsion.

H. Non-shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

2.4 COMPOUNDS, HARDENERS AND SEALERS

A. Membrane Curing Compound and Sealer: ASTM C1315 Type I, Class A. Dayton Superior or Equal
   1. Install only in areas not receiving finish flooring system.

2.5 CONCRETE MIX

A. Mix and deliver concrete in accordance with ASTM C94/C94M, Option A.

B. INTERIOR CONCRETE SLAB ON GRADE: Furnish concrete of the following strength:
   1. 150 PCF
   2. Compressive strength 3,000 psi (28 day).
   3. Slump limit of 5 inches at point of placement.
   4. Minimum Cement Content: 610 pounds/cu yd.
   5. Maximum water-cement ratio: 0.50
   6. Air Entrainment: Entrapped
   7. Transit Mixed.

2.6 GRANULAR BASE

A. Interior slabs:
   1. Install 4” pea gravel, clean and graded, washed river-run gravel, ASTM C33, Size #7.
   2. Match existing as applicable

PART 3 EXECUTION

3.1 FORMWORK ERECTION

A. Erect formwork, shoring and bracing to achieve design requirements.

B. Apply form release agent to formwork prior to placing form accessories and reinforcement.

C. Clean forms as erection proceeds, to remove foreign matter.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

A. Provide formed openings where required for work to be embedded in and passing through concrete members.

B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install concrete accessories straight, level, and plumb.

D. Place joint filler at perimeter of floor slab, penetrations, and isolation joints.

3.3 REINFORCEMENT PLACEMENT

A. Place reinforcement, supported and secured against displacement.

B. Ensure reinforcing is clean, free of loose scale, dirt, or other foreign coatings.

C. Do not weld reinforcement bars for assembly.

D. Space reinforcement bars with a minimum clear space in accordance with ACI 301 of not less than 1 inch.

E. Maintain concrete cover around reinforcement in accordance with ACI 301 of not less than 1 1/2" inches for concealed work and 3 inches for concrete exposed to weather.

3.4 PLACING CONCRETE

A. Install 4 inch minimum thickness granular base over undisturbed soils and compact as applicable.

B. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

C. Install vapor barrier under interior slabs on grade in accordance with ASTM E1643. **Lap joints minimum 6 inches and seal watertight using manufacturer supplied tape.**

D. Seal vapor barrier tight around all penetrations in accordance with manufacturer requirements.

E. Repair damaged vapor retarder with vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.

F. Place concrete continuously between predetermined expansion, control and construction joints. Do not break or interrupt successive pours creating cold joints.

G. Separate slabs-on-grade from vertical surfaces with 1/2 inch thick joint filler, extended from bottom of slab to within 1/4 inch of finished slab surface.

H. Where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack with non-shrink grout.

I. Screed slabs-on-grade level.

3.5 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Remove formwork progressively and in accordance with code requirements.

3.6 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Uniformly spread, screed, and float concrete.
   1. Smooth finish at interior slabs.
   2. Align flush with adjacent concrete finishes.

C. Maintain surface flatness, with maximum variation of 1/8 inch in 10 ft.

D. Control joints:
   1. Locate at maximum of 12’-0” o.c. each way.
   2. Sawcut joints permitted only at concealed concrete areas.
   3. Trowel and re-trace joints at all exposed concrete areas.

3.7 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   1. Protect concrete footings from freezing for a minimum of 7 days.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete for not less than 7 days.

C. Apply sealer on floor surfaces not receiving finish floor system.

3.8 ERECTION TOLERANCES

A. Install reinforcement within tolerances required by ACI 301.

3.9 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with ACI 301 at the request of Architect.

B. Field Testing:
   1. Measure slump and temperature for each compressive strength concrete sample.
   2. Measure air content in air entrained concrete for each compressive strength concrete sample.

C. Cylinder Compressive Strength Testing:
   1. Test Method: ASTM C39.
   2. Test Acceptance: In accordance with ACI 301.
   3. Test two cylinders at 28 days.
   4. Dispose remaining cylinders when testing is not required.

3.10 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by Architect.

END OF SECTION

SECTION 04 01 00 - MAINTENANCE OF MASONRY

PART 1 GENERAL

1.1 WORK INCLUDES BUT NOT LIMITED TO:

A. Removal and replacement of damaged concrete masonry units.
   1. Includes supplemental new masonry as required to replace damaged masonry from removals.

B. Re-pointing mortar joints including raking, pointing-up and tooling of mortar joints in masonry where impacted by work.

1.2 QUALITY ASSURANCE

A. Installer qualifications: 10 years-experience on similar projects. Work shall be performed by experienced and skilled mechanics.

B. Source limitations: obtain each type of material for masonry restoration [CMU, cement, sand, etc.] from one source with resources to provide materials of consistent quality in appearance and physical properties.

C. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

1.3 PRODUCT HANDLING

A. Deliver mortar materials to project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

D. Store lime putty covered with water in sealed containers.

E. Store sand where grading and other required characteristics can be maintained and contamination avoided.

1.4 ENVIRONMENTAL REQUIREMENTS / PROJECT CONDITIONS

A. Repoint mortar joints and repair masonry only when air temperature is between and 40°F and 90°F and is predicted to remain so for at least 7 days after completion of work.
   1. In accordance with ACI 530.1

B. Hot-weather requirements: protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90°F and above.
   1. In accordance with ACI 530.1

C. Patch masonry only when air and surface temperatures are between and 55°F and 100°F and are predicted to remain above 55°F for at least 7 days after completion of work. On days when air temperature is predicted to go above 90°F, schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.

D. Provide shoring, bracing, or support to prevent movement, settlement, or collapse of structure, work under demolition, or adjacent work to remain.

E. Prevent grout or mortar used in assembly and repair work from staining face of surrounding surfaces. Immediately remove grout and mortar in contact with exposed surfaces.

F. Protect sills, ledges, and projections from mortar droppings.

1.5 SEQUENCING AND SCHEDULING

A. Perform re-pointing after repair of existing masonry, including replacing existing masonry with new masonry materials and cleaning.

B. As scaffolding is removed, patch any anchor holes used to attach scaffolding. Patch holes in mortar joints in accordance with section covering re-pointing masonry.

1.6 MOCKUP

A. Construct a mockup of the masonry repairs for review by Architect, if warranted by conditions.

PART 2 - PRODUCTS

2.1 FACTORY-MIXED MORTAR

A. Match original mortar remnants on brick as determined from field sampling and laboratory analysis at the mortar manufacturers plant. Match for color, texture and compressive strength.

2.2 COMPONENTS

A. Portland Cement: ASTM C150, Type I, gray color.

B. Premix Mortar for below grade applications: ASTM C387/C387M, Type S using gray color cement.

C. Premix Mortar for above grade applications: ASTM C387/C387M, Type N using colored cement.

D. Mortar Aggregate: ASTM C144, standard masonry type.

E. Hydrated Lime: ASTM C206, Type N.

F. Mortar Color: color as selected by Architect from full range of available colors for above grade applications.

G. Grout Aggregate: ASTM C404, fine.

H. Water: Clean and potable.

I. Bonding Agent: Latex type.

J. Calcium chloride is not permitted.

2.3 MIXES

A. Mortar Mixes:
   1. Mortar for Structural Masonry: ASTM C270, Type N using Proportion specification.
   2. Mortar for Non-Structural Masonry: ASTM C270, Type N using Proportion specification.

B. Mortar Mixing:
   1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
   2. Add mortar color.

C. Grout Mixing:
   1. Mix grout in accordance with ASTM C94/C94M.
   2. Do not use anti-freeze compounds to lower freezing point of grout.

D. Mixing Procedures:

1. Measure materials by volume or equivalent weight. Do not measure by shovel; use known measure.
2. To hydrate mortar, thoroughly mix ingredients dry. Mix again, adding only enough water to produce a damp mix which will retain its form when pressed in a ball. After keeping mortar in this dampened condition for 1-2 hours, add sufficient water to form proper consistency.
3. Mix mortar using a clean mechanical batcher for 3-5 minutes or by hand until completely mixed.
4. Place mortar within two hours of final mixing.
5. Do not re-temper or use partially hardened materials

2.4 MASONRY

A. Provide masonry units with colors, surface texture, size, and shape to match existing masonry and with physical properties not less than those determined from pre-construction testing of selected existing units.

B. Concrete Masonry Units:
   1. Size and Shape: Nominal modular size of 4 x 8 x 16, 6 x 8 x 16, 8 x 8 x 16, or 12 x 8 x 16 inches as indicated on drawings. Furnish special units for 90 degree corners, bond beams, lintels, bullnosed corners.
      a. Hollow Load Bearing Concrete Masonry Units: ASTM C90; normal weight.
      b. Hollow Non-Load Bearing Concrete Masonry Units: ASTM C129; normal weight.

C. Provide specially molded shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

D. For existing masonry that exhibits a range of colors, provide brick that matches that range rather than brick that matches an individual color within that range. Provide a sample for architect's approval where possible remove from areas to be demolished and salvage for reuse.

2.5 ACCESSORIES

A. Single Wythe Joint Reinforcement: ASTM A951/A951M; truss or ladder type; steel; 0.148 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

B. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.

C. Preformed Control Joints: Neoprene material. Furnish with corner and tee accessories.

D. Precast Concrete Lintels: nominal 4”x8”, 6”x8”, or 8”x8” precast concrete lintels as required by conditions at new door openings. Refer to Drawings.

E. Steel Lintels: See Section 05 12 00 and Lintel Schedule on Drawings.

F. Adjustable Anchors / Wire Ties to Connect to Existing Structure: Anchors / Wire Ties that allow for vertical and / or horizontal adjustment but resist tension and compression forces on the wall.
   1. Adjustable ties with pintle and eye connections with an adjustment of +/- 1 inch.

G. Compressible Expansion Joint Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from closed cell neoprene or urethane. Sized as applicable to conditions.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.

B. Prevent mortar from staining face of surrounding masonry and other surfaces. Cover sills, ledges, and projections to protect from mortar droppings. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering. Immediately remove mortar in contact with exposed masonry and other surfaces. Clean mortar splatters from scaffolding at end of each day.

3.2 INSTALLATION

A. Install mortar in accordance with ACI 530.1 Specification for Masonry Structures.

3.3 FIELD QUALITY CONTROL

A. Testing of Mortar Mix: In accordance with ASTM C780.

B. Testing of Grout Mix: In accordance with ASTM C1019.

3.4 MASONRY REPLACEMENT

A. Remove and replace masonry where indicated on drawings and as required to facilitate work. Reuse/reinstall existing salvaged masonry and supplement with new masonry to match where required [match existing].

B. Remove in an undamaged condition as much masonry as possible. Remove mortar, loose particles, and soil from brick and stone by cleaning with hand chisels, brushes, and water.

C. The documents show the masonry to be removed at each area of repair. Depending on the Contractor's care, additional masonry may require replacement. The Contractor shall include in the base bid allowance for additional replacement masonry at the designated areas of removal. These masonry quantities are not to be considered under the stated bid allowance for additional replacement.

D. Clean masonry surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.

E. Install replacement masonry into bonding and coursing pattern of existing masonry. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.

F. Lay replacement masonry with completely filled bed, head, and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet both replacement and surrounding bricks that have ASTM C 67 initial rates of absorption [suction] of more than 30 g/30 square inch per min. Use wetting methods that ensure that units are nearly saturated but surface is dry when laid. Maintain joint width for replacement units to match existing joints.

G. Tool exposed mortar joints in repaired areas to match surrounding existing brickwork.

H. Pointing: during the tooling of joints, enlarge any voids or holes, except weep holes and completely fill with mortar. Point up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking of sealant compounds.

3.5 RE-POINT EXISTING MASONRY [AS IMPACTED BY MASONRY REMOVAL]

A. Joint raking: rake out all joints to be pointed by hand, using a mason's chisel that is not more than ¼ inch thick or by approved hand grinding methods. If grinding is used, wet methods are required to minimize dirt and dust. Rake or grind out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1-inch nor less than required to expose sound, un-weathered mortar.
   1. Remove mortar to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris. No abrasive methods of cleaning shall be used.
   2. Do not spall edges of masonry units or widen joints. Replace masonry units which become damaged.

a. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

3. Replace any units which become damaged.
4. If the existing bricks have worn rounded edges, recess final mortar slightly from face to a point where joint face will not be wider than the original joint.

B. Joint Pointing:
1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8-inch until uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.
3. After joints are filled to uniform depth, place remaining pointing mortar in 3 layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint-hard before applying next layer. Take care not to spread mortar over edges onto masonry surfaces, or to featheredge mortar.
4. When mortar is thumbprint-hard, tool joints to match original appearance of joints as determined by the architect. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in damp condition for not less than 72 hours.

3.6 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure. Do not use metal scrapers or brushes. Do not use acidic or alkaline cleaners.

B. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.7 GENERAL CLEANING

A. As work proceeds and on completion, remove excess mortar, smears, droppings.

B. Clean dirt and light staining from all brick surfaces.

C. Perform cleaning working from top to bottom working in sections around the building at one elevation at a time.

D. Use spray equipment that provides controlled application at volume and pressure indicated. Adjust pressure and volume to ensure cleaning methods do not damage masonry.

END OF SECTION

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SECTION 04 05 14 - MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes mortar and grout for masonry.

1.2 SUBMITTALS

A. Samples: Submit two samples of mortar illustrating mortar color and color range.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 PRODUCTS

2.1 MORTAR AND MASONRY GROUT

A. Manufacturers:
   1. Cemex
   2. Glen-Gery
   3. Quikrete Companies
   4. Southern Grouts and Mortars.

2.2 COMPONENTS

A. Portland Cement: ASTM C150, Type I, gray color.

B. Premix Mortar for below grade applications: ASTM C387/C387M, Type S using gray color cement.

C. Premix Mortar for above grade applications: ASTM C387/C387M, Type N using colored cement.

D. Mortar Aggregate: ASTM C144, standard masonry type.

E. Hydrated Lime: ASTM C206, Type N.

F. Mortar Color: color as selected by Architect from full range of available colors for above grade applications.

G. Grout Aggregate: ASTM C404, fine.

H. Water: Clean and potable.

I. Bonding Agent: Latex type.

J. Calcium chloride is not permitted.

2.3 MIXES

A. Mortar Mixes:
   1. Mortar for Structural Masonry: ASTM C270, Type N using Proportion specification.
   2. Mortar for Non-Structural Masonry: ASTM C270, Type N using Proportion specification.

B. Mortar Mixing:
   1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
   2. Add mortar color.

C. Grout Mixing:
   1. Mix grout in accordance with ASTM C94/C94M.
   2. Do not use anti-freeze compounds to lower freezing point of grout.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install mortar in accordance with ACI 530.1 Specification for Masonry Structures.

3.2 FIELD QUALITY CONTROL

A. Testing of Mortar Mix: In accordance with ASTM C780.

B. Testing of Grout Mix: In accordance with ASTM C1019.

3.3 SCHEDULES

A. CMU: 6” and 8” CMU with Type N mortar.

3.4 REPOINTING MASONRY

A. Rake out joints as follows:
   1. Rake out mortar from joints to depths equal to 2 ½ times their widths, but not less than ½” or not less that that required exposing sound unweathered mortar.
   2. Remove mortar from masonry surfaces within raked out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.
   3. Do not spall edges of masonry units or widen joints. Replace damaged masonry units.
      a. Cut out old mortar by hand with a chisel and mallet, unless otherwise indicated.
      b. Do not use power-operated grinders without Architect’s written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

B. Point joints as follows:
   1. Rinse masonry-joint surfaces with water to remove dust and mortar particles. Time rinsing application so, at the time of pointing, excess water has been evaporated or run off and joint surfaces are damp but free of standing water.
   2. Apply first layer if pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers in not greater than 3/8 inch until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint hard before applying the next layer.
   3. After joints have been filled to a uniform depth, place remaining pointing mortar in three layers with first and second layers each filling about two-fifths of joint depth; third layer, the remaining one-fifth. Fully compact each layer and allow becoming thumbprint hard before applying next layer. Where existing bricks have rounded edges, slightly recess final layer from face. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar.
   4. When mortar is thumbprint hard, too l joints to match original appearance of joints, unless otherwise indicated. Remove excess mortar from edge of joint by brushing.
   5. Cure mortar by maintaining in a damp condition for at least 72 hours.

6. Where repointing work precedes cleaning of existing masonry, allow hardening at least 30 days before beginning cleaning work.

END OF SECTION

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SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes concrete masonry units, reinforcement, anchorage, and accessories.

1.2 PERFORMANCE REQUIREMENTS

A. Concrete Masonry Compressive Strength (f'm): 1,500 psi; determined by unit strength method.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Concrete Masonry Units:
   1. Size and Shape: Nominal modular size of 4 x 8 x 16, 6 x 8 x 16, 8 x 8 x 16, or 12 x 8 x 16 inches as indicated on drawings. Furnish special units for 90 degree corners, bond beams, lintels, bullnosed corners.
      a. Hollow Load Bearing Concrete Masonry Units: ASTM C90; normal weight.
      b. Hollow Non-Load Bearing Concrete Masonry Units: ASTM C129; normal weight.

2.2 ACCESSORIES

A. Single Wythe Joint Reinforcement: ASTM A951/A951M; truss or ladder type; steel; 0.148 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

B. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.

C. Mortar and Grout: As specified in Section 04 05 14.

D. Preformed Control Joints: Neoprene material. Furnish with corner and tee accessories.

E. Joint Filler: Closed cell **polyurethane**; oversized 50 percent to joint width; self expanding; 1/2 inch wide x by maximum lengths.

F. Precast Concrete Lintels: nominal 4”x8”, 6”x8”, or 8”x8” precast concrete lintels as required by conditions at new door openings. Refer to Drawings.

G. Bond Beams: Refer to Drawings.

H. Steel Lintels: See Section 05 12 00 and Lintel Schedule on Drawings.

I. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials; recommended by masonry unit manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

A. Coordinate placement of anchors supplied by other sections.

3.3 INSTALLATION

A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

B. Coursing of Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.

C. Cut mortar joints flush where ceramic wall tile is scheduled, cement parging is required, resilient base is scheduled.

D. Joint Reinforcement And Anchorage - Single Wythe Masonry:
   1. Install horizontal joint reinforcement 16 inches oc. Place joint reinforcement continuous in first joint below top of walls.
   2. Place masonry joint reinforcement in first horizontal joint above and below openings. Extend minimum 16 inches each side of opening.
   3. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches oc.

E. Lintels:
   1. Install loose steel or precast concrete lintels over openings.
   2. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled or indicated.
   3. Maintain minimum 8 inch bearing on each side of opening.

F. Grouted Components:
   1. Reinforce bond beam and pilasters as detailed.
   2. Support and secure reinforcing bars from displacement.
   3. Place and consolidate grout fill without displacing reinforcing.
   4. At bearing locations, fill masonry cores with grout for minimum 12 inches both sides of opening.

G. Control Joints:
   1. Install control joints at the following maximum spacings, unless otherwise indicated on Drawings:
      a. Exterior Walls: 20 feet on center and within 24 inches on one side of each interior and exterior corner.
      b. Interior Walls: 30 feet on center.
      c. At changes in wall height.
   2. Do not continue horizontal joint reinforcement through control joints.
   3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
   4. Install preformed control joint device in continuous lengths. Seal butt and corner joints.

H. Built-In Work:
   1. As work progresses, install built-in metal door frames, window frames, anchor bolts and plates and other items to be built in the work furnished by other sections.

2. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings].

I. Cutting And Fitting:
   1. Cut and fit for chases, pipes, conduit, sleeves, grounds and other penetrations. Coordinate with other sections of work to provide correct size, shape, and location.

J. Cleaning:
   1. Remove excess mortar and mortar smears as work progresses.
   2. Clean soiled surfaces with cleaning solution.

K. Tolerances:
   1. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
   2. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

END OF SECTION

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SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: blocking in wall openings; concealed wood blocking; and preservative treatment of wood.

1.2 QUALITY ASSURANCE

A. Perform Work according to following:
   1. Lumber Grading Agency: Certified by DOC PS 20.
   2. Lumber: DOC PS 20.
   3. Wood Structural Panels: DOC PS 1 or DOC PS 2.

B. Surface Burning Characteristics:
   1. Fire Retardant Treated Materials: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.

PART 2 PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: SPIB; ASLS

B. Miscellaneous Framing: Stress Group D SPF or SYP species, #2 grade, 19 percent maximum moisture content, fire retardant treated. 1x and 2x as noted on drawings.

C. Plywood: APA/EWA, Structural I, Grade B-C; Exposure Durability 2; sanded, fire retardant treated.

2.2 FIRE-RETARDANT-TREATED MATERIALS (FRT)

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
   1. Use treatment that does not promote corrosion of metal fasteners.
   2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

2.3 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.

2. Nails and Staples: ASTM F1667.
3. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel. All anchors sized to suit application and loads.

2.4 FIREBLOCKING AND FIRESTOPPING

A. Fireblocking: Solid lumber, structural wood panel, or particleboard, fire retardant treated.
   1. Solid lumber nominal 2 inches thick.
   2. Structural wood panel 23/32 inch thick with joints backed by structural wood panel.

2.5 FACTORY WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA U1, Commodity Specification A-Sawn Products or F-Wood Composites using water-borne ACQ preservative.

B. Fire Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested according to ASTM E84 and showing no evidence of significant progressive combustion when test is continued for an additional 20 minute period, Interior Type.

C. Moisture Content after Treatment: Kiln dried (KDAT).
   1. Lumber: Maximum 19 percent.
   2. Structural Panels: Maximum 15 percent.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate conditions are ready to receive blocking and framing.

3.2 PREPARATION

A. Coordinate placement of blocking and framing items.

3.3 FRAMING

A. Erect wood framing/blocking in accordance with Ohio Building Code. Place members level and plumb. Place horizontal members crown side up.

B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.

C. All exterior blocking intended to be left exposed to weather shall be pressure treated and anchored with galvanized fasteners and appropriate connectors.

D. All blocking and framing shall be fire retardant treated.

E. Fasten blocking per conditions and in accordance with Ohio Building Code.

3.4 FIREBLOCKING AND DRAFTSTOPPING

A. Install fireblocking to cut off concealed draft openings as required.
   1. Concealed Framed Wall and Furred Spaces: Install fireblocking vertically at floor and ceiling levels and horizontally.
   2. Connections Between Horizontal and Vertical Spaces: Install fireblocking between vertical walls and partitions and the following:
      a. Horizontal floor and roof framing.
      b. Soffits, dropped ceilings, cove ceilings and other horizontal concealed spaces.

3.5 SITE APPLIED WOOD TREATMENT

A. Treat site sawn cuts. Brush apply one coat of preservative treatment on untreated wood in contact with cementitious materials.

B. Allow preservative to cure prior to erecting members.

3.6 TOLERANCES

A. Framing members: ¼ inch from indicated position, maximum.

END OF SECTION

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SECTION 06 61 16 - SOLID SURFACING FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes cast plastic / solid surface fabrications as scheduled.

1.2 REFERENCES

A. ASTM International:
   1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

C. Underwriters Laboratories Inc.:
   1. UL - Fire Resistance Directory.

1.3 DESIGN REQUIREMENTS

A. Design Load: Limit deflection to 1/360.
   1. Design items with sufficient strength for handling stresses.

1.4 SUBMITTALS

A. Shop Drawings: Indicate dimensions, thicknesses, required clearances, tolerances, materials, colors, finishes, fabrication details, field jointing, adjacent construction, methods of support, integration of electrical components, and anchorages.

B. Product Data: Submit data on specified component products, electrical characteristics and connection requirements.

C. Samples: Submit two samples representative of countertop illustrating color, texture, and finish.

D. Manufacturer's Installation Instructions: Submit preparation of opening required, rough-in sizes; tolerances for item placement, temporary bracing of components.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit list of approved cleaning materials and procedures required; list of substances harmful to component materials, Include instructions for stain removal, surface and gloss restoration, and general repairs.

1.6 QUALITY ASSURANCE

A. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

B. Obtain materials from one source from a single manufacturer unless specifically noted otherwise on drawings.

1.7 QUALIFICATIONS

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

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Manufacturer Warranty: Provide 10 year material warranty against defects and/or deficiencies in the solid surface materials unless a non-covered condition.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer List:
   1. Corian, Dupont [Basis of Design – see schedule of finishes on drawings]
   2. Wilsonart Contract
   3. Samsung Chemical

2.2 MATERIALS

A. Solid Surface Materials: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment; not coated, laminated or of composite construction; meeting following criteria:
   1. Comply with ISSFA-2.

B. Performance / Design Criteria:
   1. Tensile Strength: 6,000 PSI min [ASTM D638]
   2. Tensile Modulus: 1.5 x 10^6 PSI min. [ASTM D638]
   3. Tensile Elongation: 0.4% min. [ASTM D638]
   4. Flexural Strength: 10,000 PSI min [ASTM D790]
   5. Flexural Modulus: 1.2 x 10^6 PSI min [ASTM D790]
   6. Hardness: >85-Rockwell “M” scale min. [ASTM D785]
   7. Thermal Expansion: 2.2 X 10^-5 in/in/deg. F [ASTM E228]
   8. Fungi/ Bacteria: does not support microbial growth [ASTM G21 / G22]
   9. Microbial Resistance: Highly resistant to mold growth [UL 2824]
   10. Ball Impact: No fracture – ½ lb. ball, 144” drop onto 12 mm slab [NEMA LD 3, Method 3.8]
   11. Flammability [ASTM E84]
   12. Flame Spread: <25
   13. Smoke Developed Index: <25
   14. Class A Rated

C. Adhesive for Bonding to Other Products: One component silicone to ASTM C920.

D. Adhesives: for seams and drop edges: Manufacturer seaming cartridge kit, single component. Color to blend with sheet color.

E. Sealant: A standard mildew-resistant, FDA/UL and NSF/ANSI 51 compliant in Food Zone area, recognized silicone color matched sealant or clear silicone sealants.

2.3 COMPONENTS

A. Counter Perimeter Frame: 3/4" thick, moisture resistant cores for counter tops in wet areas having sinks or lavatories are 3/4" thick exterior grade plywood with waterproof adhesive, Fir or Poplar plywood, veneer core only. MDF core conforming to ANSI/NPA A208.2 balanced design, of minimum density of 48 lb/cu ft and surface character to match sample approved by Architect. Ensure fire retardant Product contains fire-retardant chemicals injected with raw materials during manufacturing and achieves a maximum flame-spread rating of 25 with a maximum smoke development of 200 when tested to ASTM E84.

B. Countertops: 1/2” [12 mm] thick countertop of solid polymer solid surfacing material, cast to desired profiles and sizes having edge details as indicated on Drawings conforming to CSA B45.5/IAPMO Z124. Provide countertops complete with backsplashes of size shown on Drawings. Attach to mounting hardware / brackets according to manufacturer's instructions.

C. Polishing Cream: Compatible polishing cream to achieve specified sheen to gel coat.

D. Adhesive: as recommended by Manufacturer.

2.4 FABRICATION

A. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid polymer manufacturer requirements. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints. Provide factory cutouts for plumbing fittings and accessories as indicated on Drawings.
   1. AWI Grade: Custom.

B. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.

C. Provide cut-outs for plumbing fixtures, trim, accessories, and related items. Confirm exact locations and rough in conditions prior to beginning work.

D. Ensure no blistering, whitening and cracking of components during forming.

E. Fabricate backsplashes from solid surfacing material with radius cove where counter and backsplashes meet as indicated on Drawings.

F. Fabricate joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint.

G. Provide holes and cutouts for plumbing and bath accessories as indicated on Drawings.

H. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.

I. Finish: Ensure surfaces have uniform finish. Matte finishes unless noted otherwise.

J. Radius corners and edges.

2.5 SHOP FINISHING

A. Color: as selected from full range of Manufacturer colors and patterns

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify joint preparation and affected dimensions are acceptable.

3.2 PREPARATION

A. Provide anchoring devices for installation and embedding.

B. Provide templates and rough-in measurements.

3.3 INSTALLATION

A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.

B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.

C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer's written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.

D. Install countertops with no more than 1/8" sag, bow or other variation from a straight line.

E. Seal between wall and components with joint sealant as specified.

F. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard color-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard color-matched silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer's standard color-coordinated joint adhesive.

G. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Completion of the Work.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Indicated Dimension: 1/8 inch.

B. Maximum Offset From Indicated Position: 1/8 inch.

3.5 CLEANING

A. Clean and polish fabrication surfaces.

3.6 SCHEDULE

A. Refer to Drawings

END OF SECTION

SECTION 07 21 16 - BLANKET INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Batt insulation and vapor retarder in exterior wall and sound batt insulation in interior wall and ceiling construction as indicated.

1.2 SYSTEM DESCRIPTION

A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements [in conjunction with thermal insulating materials in other sections.

B. Materials of This Section: Provide thermal protection to vapor retarder in conjunction with vapor retarder materials.

C. Materials of This Section: Provide thermal protection to air seal materials at building enclosure elements in conjunction with air barrier materials.

1.3 PERFORMANCE REQUIREMENTS

A. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96.

1.4 SYSTEM DESCRIPTION

A. Design Requirements: Provide [Products/systems] that have been manufactured, fabricated and installed to the following criteria:
   1. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
   2. Surface Burning Characteristics (ASTM E84): flame spread rating < 25 and smoke developed index rating < 450.

1.5 SUBMITTALS

A. Product Data: Product characteristics, performance criteria, limitations.

1.6 QUALITY ASSURANCE

A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
   1. Batt Insulation: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.

PART 2 PRODUCTS

2.1 BATT INSULATION COMPONENTS

A. Batt Insulation: ASTM C665; preformed fiberglass batt and blanket; friction fit to framing as applicable, conforming to following:
   1. Thermal Resistance:
      a. R of 13 [3 5/8 inch walls].
   2. Batt Size: nominal 16 or 24 wide to match framing conditions.
   3. Facing: Faced on one side with asphalt treated mesh reinforced kraft paper [exterior walls only – unfaced at ceilings.

B. Sound Attenuation Batt Insulation for Interior Walls: ASTM C665, Type I, preformed glass fiber batt, friction fit:
   1. Thickness: 3 inch and 6 inch to match wall thickness.

2. Facing: Unfaced.

C. Fire Resistance Rated Batt Insulation: ASTM C665, preformed mineral wool insulation, friction fit
   1. Size / thickness as required for fire resistance rated assemblies.
   2. Facing: Unfaced.

D. Sheet Vapor Retarder: polyethylene film for above grade application, 6 mil thick. [only where required by field conditions without air barrier and / or kraft faced insulation.

E. Fasteners: type and size to suit application.

F. Tape: self-adhering type as recommended by insulation manufacturer, 2 inch wide.

G. Insulation Fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

H. Wire Mesh: Galvanized steel, hexagonal wire mesh.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate, adjacent materials, and insulation boards are dry and ready to receive insulation.

3.2 INSTALLATION

A. Install in exterior walls without gaps or voids. Do not compress insulation.

B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

C. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane **over** framing members.

D. Retain insulation in place as applicable to the conditions.

E. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

F. Metal Framing: Place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.

G. Tape seal tears or cuts in vapor retarder.

H. Extend vapor retarder tight to full perimeter of adjacent window and door frames and other items interrupting plane of membrane. Tape seal in place.

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Firestopping through-penetrations of fire rated assemblies.
   2. Firestopping joints in fire rated assemblies.
   3. Firestopping tops of fire rated walls.
   4. Smoke sealing at joints between floor slabs and exterior walls.
   5. Smoke sealing penetrations and joints of smoke partitions.

1.2 REFERENCES

A. ASTM International:
   1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
   4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. Forest Stewardship Council:
   1. FSC Guidelines - Forest Stewardship Council Guidelines.

C. Intertek Testing Services (Warnock Hersey Listed):
   1. WH - Certification Listings.

D. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

E. Underwriters Laboratories Inc.:
   1. UL 263 - Fire Tests of Building Construction and Materials.
   2. UL 1479 - Fire Tests of Through-Penetration Firestops.
   3. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
   4. UL - Fire Resistance Directory.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 PERFORMANCE REQUIREMENTS

A. Conform to UL for fire resistance ratings and surface burning characteristics.

1.5 SUBMITTALS

A. Product Data: Submit data on product characteristics, performance and limitation criteria.

B. Manufacturer's Installation Instructions: Submit preparation and installation instructions.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements and applicable code requirements.

1.6 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
   1. Floor / Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.

B. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.

C. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.

D. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials.

B. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 FIRESTOPPING

A. Manufacturers:
   1. Hilti
   2. 3M Fire Protection Products
   3. Tremco
   4. Equal.

B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
   1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
      a. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
   2. Foam Firestopping Compounds: Single component foam compound.
   3. Fiber Stuffing and Sealant Firestopping: Composite of mineral fiber stuffing insulation with silicone elastomer for smoke stopping.
   4. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.

2.2 ACCESSORIES

A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

B. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Install backing materials to arrest liquid material leakage.

3.3 APPLICATION

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.

C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.

D. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.

3.4 FIELD QUALITY CONTROL

A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

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SECTION 07 90 00 - JOINT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes sealants and joint backing.

1.2 SUBMITTALS

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

1.3 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.4 QUALITY ASSURANCE

A. Sealant shall be installed by a qualified sealant applicator for any/all joint sealant exposed to view. Owner reserves the right to request a mockup of the quality for the joint sealant installation.

1.5 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: 2 years from date of Contract Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which silicone sealant manufacturer agrees to furnish silicone joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: 5 years from date of Contract Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
   1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.1 JOINT SEALERS

A. Manufacturers:
   1. Tremco [basis of design]
   2. Sika
   3. GE Silicones.
   4. Pecora Corp.
   5. DAP

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

C. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

D. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

E. Liquid-Applied Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

F. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

G. Additional Movement Capability: Where additional movement capability is specified, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.

H. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range, unless otherwise noted.

2.2 SILICONE JOINT SEALANTS:

A. **Type S-1**: Single component, nonsag, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use NT
   1. Tremco Spectrem 1 or Spectrem 800 or Equal

B. **Type S-2**: Single Component, nonsag, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, use NT
   1. Tremco Spectrem 2 or Spectrem 3 or Equal

C. **Type S-3**: Multi-Component, Nonsag, Silicone Joint Sealant: ASTM C920, Type M, Grade NS, Class 50, Use NT
   1. Tremco Spectrem 4-TS or Equal

D. **Type S-4**: Single Component, nonsag, Traffic-Grade, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use T
   1. Tremco Spectrem 800 or Equal

E. **Type S-5**: Mildew Resistant, Single Component, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT
   1. Tremco Tremsil 200 Sanitary or Equal

2.3 URETHANE JOINT SEALANTS

A. **Type U-1**: Single Component, nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25 or 35, Use NT:
   1. Tremco Dymonic or Dymonic FC or Equal

B. **Type U-2**: Single Component, nonsag, Traffic Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use T.
   1. Tremco Vulkem 116 or Equal.

C. **Type U-3**: Multi-Component, nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use T.
   1. Tremco Dymeric 240 or Dymeric 240 FC or Equal

D. **Type U-4**: Multi-Component, nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use NT.

1. Tremco Vulken 227 or Equal

E. **Type U-5**: Multi-Component, nonsag, Traffic Grade, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use T.
   1. Tremco Vulken 227 or Equal

2.4 BUTYL JOINT SEALANTS

A. **Type B-1**: Butyl Rubber based Joint Sealants: ASTM C 1311
   1. Tremco General Purpose Butyl Sealant or Equal

2.5 LATEX JOINT SEALANTS

A. **Type L-1**: Latex Joint Sealant: Acrylic latex or Siliconized Acrylic Latex: ASTM C834, Type OP, Grade NF or better
   1. Tremco Tremflex 834 or Equal.

B. **Type L-2**: Paintable Mildew-Resistant Latex Joint Sealant: Acrylic Latex or Siliconized Acrylic Latex: ASTM C834, Type OP, Grade NF or better.
   1. Tremco Tremflex 834 or Equal.

2.6 ACCESSORIES

General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

A. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
   1. Oversized to 30 to 50 percent larger than joint width.

B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

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

D. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated. Non-staining type, recommended by sealant manufacturer to suit application.

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

PART 3 EXECUTION

3.1 EXAMINATION

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

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

3.2 PREPARATION

A. Remove loose materials and foreign matter impairing adhesion of sealant.

B. Clean and prime joints.

C. Perform preparation in accordance with ASTM C1193.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C1193.

B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

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

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

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

F. Tool joints concave.

3.4 SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and non-traffic horizontal surfaces.
   1. Joint locations such as, but not limited to:
      a. Construction joints in cast-in-place concrete.
      b. Control joints in unit masonry.
         1) Provide joint sealants slightly darker than the adjacent masonry units. Provide multiple colors as may be required for match.
      c. Perimeter joints between masonry, concrete, or stone and frames of doors, windows, storefronts, louvers, and similar openings.
      d. Lintels and shelf angles to masonry construction.
      e. Butt joints between metal panels.
      f. Control and expansion joints in ceiling/soffit and similar overhead surfaces.
      g. Exterior joints between dissimilar materials where the joining of the two surfaces leaves a gap between the meeting materials or components as may be dictated by various methods of construction to make building watertight.
      h. Other joints as indicated on Drawings.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-1, Type S-2, Type S-3**
   3. Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
   1. Joint locations such as, but not limited to:
      a. Isolation joints in cast-in-place concrete slabs.
      b. Perimeter of floor slabs or concrete curbs which abut vertical surfaces.
      c. Areas around all piping systems that penetrate the slab or foundation walls below grade (utility trenches, electrical conduits, plumbing penetrations, etc.).
      d. Control and expansion joints in tile flooring.
      e. Other joints as indicated on Drawings.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-4**
   3. Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces, subject to movement, unless otherwise noted.
   1. Joint locations such as, but not limited to:
      a. Control joints on exposed interior surfaces of exterior walls.
      b. Interior joints where interior partitions meet exterior walls of dissimilar materials and components.
      c. Other joints as indicated on Drawings.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-1**

3. Color: As selected by Architect from manufacturer's full range of colors. Paintable Sealant, prep for painted finish.

D. Joint-Sealant Application: Interior joints in vertical surfaces subject to abuse and movement.
   1. Joint locations such as, but not limited to:
      a. Vertical joints, including control joints and joints between masonry and structural support members, on exposed surfaces of interior unit masonry walls and partitions.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-1**
   3. Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Interior joints in vertical surfaces not subject to movement.
   1. Joint locations such as, but not limited to:
      a. Interior perimeter joints of exterior openings.
      b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
      c. Interior joints between dissimilar materials where a gap is created where materials meet, unless otherwise noted.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type L-1, Type L-2**
   3. Color: As selected by Architect from manufacturer's full range of colors.

F. Joint-Sealant Application: Mildew-resistant interior joints in non-painted vertical surfaces and horizontal nontraffic surfaces.
   1. Joint locations such as, but not limited to:
      a. Interior joints between plumbing fixtures and adjoining floors and counters.
      b. Joints between countertops and backsplashes.
      c. For interior joints in non-painted vertical and horizontal surfaces where incidental food contact may occur.
      d. Tile control and expansion joints where indicated.
      e. Other joints as indicated on Drawings.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-5**
      a. For potable water storage sealant shall be certified by National Sanitation Foundation as conforming to the requirements of NSF Standard 61 – Drinking Water System Components – Health Effect.
      b. For surfaces where incidental food contact may occur sealant must comply with United States Department of Agriculture (USDA) guidelines for incidental food contact with cured sealant.
   3. Color: As selected by Architect from manufacturer's full range of colors.

G. Joint-Sealant Application: Mildew-resistant interior joints in painted vertical surfaces and horizontal non-traffic surfaces.
   1. Joint locations such as, but not limited to:
      a. Interior joints between plumbing fixtures and adjoining painted walls.
      b. Joints where countertops or backsplashes intersect painted walls.
      c. For interior joints in painted vertical and horizontal surfaces where incidental food contact may occur.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type L-2**
   3. Color: As selected by Architect from manufacturer's full range of colors.

H. Joint-Sealant Application: Interior or exterior joints in vertical surfaces between laps in fabrications of sheet metal.
   1. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-1**
   2. Color: As selected by Architect from manufacturer's full range of colors.

I. Joint-Sealant Application: Exterior joints under metal thresholds and saddles, sill plates, or as bedding sealant for sheet metal flashing and frames of metal or wood.
   1. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-1, Type U-1, Type B-1**
   2. Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes steel doors and frames; non-rated.

1.2 SUBMITTALS

A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, cut-outs for glazing, and finishes.

B. Product Data: Submit door and frame configurations, location of cut-outs for hardware reinforcement.

1.3 REFERENCE STANDARDS

A. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   1. ANSI/SDI A250.8 – Specifications for Standard Steel Doors and Frames.
   2. ANSI/SDI A250.4 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
   3. ANSI/SDI A250.6 – Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
   4. ANSI/SDI A250.10 – Test Procedure and Acceptance Criteria and Prime Painted Steel Surfaces for Steel Doors and Frames.
   5. ANSI/SDI A250.11 – Recommended Erection Instructions for Steel Frames.
   6. ASTM A1008 – Standard Specification for Steel Sheet, Cold-Rolled, Carbon Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
   7. ANSI/BHMA A156.115 – Hardware Preparation in Steel Doors and Frames.
   8. ANSI/SDI 122 – Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
   9. ANSI/NFPA 80 – Standard for Fire Doors and Fire Windows; National Fire Protection Association.
   10. ANSI/NFPA 105 – Standard for the Installation of Smoke Door Assemblies.
   11. NFPA 252 – Standard Methods for Fire Tests of Door Assemblies; Natural Fire Protection Association.
   12. UL 10C – Positive Pressure Fire Tests of Door Assemblies.

1.4 QUALITY ASSURANCE

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

B. Perform Work in accordance with the following:
   1. ANSI 250.8 - Recommended Specifications for Standard Steel Doors and Frames.
   2. DHI - Door Hardware Institute - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

C. Fire Rated Door Construction: Conform to NFPA 252.

D. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.

E. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.

F. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

G. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation material.

1.5 SUBMITTALS

A. Product Data: For each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, fire resistance and temperature rise ratings, profiles, and finishes.

B. Schedule: Provide schedule of hollow-metal work prepared by the supplier. Coordinate with door hardware schedule.

C. Shop Drawings: Include the following in accordance with Steel Door Institute (SDI) 111D.
   1. Elevations of each door type.
   2. Details of doors, including vertical and horizontal edge details and metal thickness.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of each different wall opening condition. Drawings must show actual wall conditions.
   6. Details of anchorages, joints, field splices, and connections.
   7. Details of accessories.
   8. Details of moldings, removable stops, and glazing.

1.6 DELIVERY, STORAGE, AND HANDLING

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

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

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
   1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.7 PROJECT CONDITIONS

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

1.8 WARRANTY

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

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

PART 2 PRODUCTS

2.1 STEEL FRAMES

A. Manufacturers:
   1. Ceco Door Products.
   2. Curries
   3. Steelcraft.

B. Product Description: Standard shop fabricated steel doors, and frames; non-rated types; flush face.

2.2 MATERIALS

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

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

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

2.3 HOLLOW METAL FRAMES

General: Provide steel frames for doors, transoms, sidelights, borrowed lights, and other openings that comply with ANSI A250.8 and with details indicated for type and profile. Conceal fastenings, unless otherwise indicated.

A. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
   1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
   2. Frames: Minimum 16 gauge thick steel sheet, factory applied baked on primer, for Level 2 and Level 3 steel doors and wood doors.
   3. Frames Face Dimension: interior door openings and borrowed lights fabricated with 2 inch face at jambs, heads, and mullions, unless otherwise indicated:
   4. 16 gauge steel, cold rolled,

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

C. Mortar/Plaster Guards: Provide minimum 26 gauge steel plaster guards or mortar boxes, welded to the frame, at back of door hardware cutouts where materials might obstruct hardware operation.

D. Provide minimum 9 MSG hinge reinforcement, including all doors with continuous type hinges.

E. Provide minimum 12 MSG frame head reinforcement for closers, surface, and concealed overhead stop and holders, removable mullions, flush bolts, and top latch of vertical rod exit devices.

F. Door Silencers: Drill stops and install 3 silencers on strike jambs of single swing frames and 2 silencers on heads of double swing frames.

G. Hollow metal frames requiring continuous hinges shall have a continuous mortar guard of a minimum 26 gauge steel, welded to frame, the full height of the door. Mortar guards shall be shop applied by frame supplier.

2.4 FRAME ANCHORAGE

A. Jamb Anchors
   1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
   2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
   3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

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

C. Provide head anchors at door or window heads over 5 feet wide at minimum 3 feet o.c. mounted in metal-stud partitions.

2.5 FABRICATION

A. Fabricate steel door and frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects, warp, or buckle. Accurately form metal to required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at the Project site.

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

C. Hollow Metal Frames:
   1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
   2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
      a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
   3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
   4. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
   5. Jamb Anchors: Provide number and spacing of anchors as follows:
      a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on-center and as follows:
         1) Two anchors per jamb up to 60 inches high.
         2) Three anchors per jamb from 60 to 90 inches high.
         3) Four anchors per jamb from 90 to 120 inches high.
         4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
      b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
         1) Three anchors per jamb up to 60 inches high.
         2) Four anchors per jamb from 60 to 90 inches high.
         3) Five anchors per jamb from 90 to 96 inches high.
         4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
         5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
   6. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

D. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.6 STEEL FINISHES

A. General: Comply with recommendations in “Metal Finishes Manual by Architectural and Metal Products (AMP) Division of National Association of Architectural Metal Manufacturers (NAAMM) for applying and designating finishes.
   1. Finish standard steel door and frames after assembly.

B. Metallic Coated Steel Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A780.
   1. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in steel, complying with SSPC Paint 20.

C. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP1, SSPC-SP 3, SSPC-SP 6/NACE No. 3.

D. Factory Priming for Field Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.
   1. Shop Primer: Manufacturer’s standard, fast curing, lead and chromate free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field applied finish paint system indicated; and providing a sound foundation for field applied topcoats despite prolonged exposure.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Verify opening sizes and tolerances are acceptable.

3.2 PREPARATION

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

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

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

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

E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

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

A. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
   1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
   3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
   4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

B. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:
      a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
      b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
      c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
      d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
   2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3.4 ADJUSTING AND CLEANING

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

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

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

3.5 SCHEDULE

A. Refer to Drawings.

END OF SECTION

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Non-rated Access doors and panels with frames.

1.2 SUBMITTALS

A. Product Data: Indicate sizes, types, finishes, hardware, scheduled locations, fire-resistance listings, and details of adjoining Work.

B. Manufacturer's Installation Instructions: Include rough-in dimensions.

1.3 QUALITY ASSURANCE

A. Fire-Rated Access Door Construction:
   1. Wall Access Doors: NFPA 252 or UL 10B.
   2. Ceiling Access Doors: ASTM E119 or UL 263.

B. Installed Fire-Rated Access Door Assembly: Conform to NFPA 80 for fire-rated class as indicated.

C. Attach label from agency approved by authority having jurisdiction to identify each fire-rated access door.

1.4 COORDINATION

A. Coordinate Work with Work requiring controls, valves, traps, dampers, cleanouts, and similar items requiring operation being located behind finished surfaces.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS

A. Flush Framed Access Doors (Type 1): Frames and nominal 1 inch wide exposed flanges of 16 gage steel and door panels of 14 gage steel.

B. Gypsum Board Access Doors (Type 2): Frames and nominal 1 inch wide flanges of 16 gauge steel and door panels of 14 gauge steel. Design flanges to be concealed by gypsum board joint finishing compound.

C. Fire-Rated Access Doors (Type 3): Frames and nominal 1 inch wide exposed flanges of minimum 16 gage steel and door panels of 20 gage steel. Provide self-closing and latching doors with cam lock.

2.2 FABRICATION

A. Fabricate units of continuous welded construction; weld, fill, and grind joints to assure flush and square unit.

B. Wall and Ceiling Access Door and Panel Hardware:
   1. Hinge: Standard continuous or concealed spring pin type, 175-degree steel hinges.
   2. Lock: Self-latching lock. Screw driver slot for quarter turn cam lock.

2.3 SHOP FINISHING

A. Base Metal Protection: Prime coat units with baked on primer.

B. Finish: to match adjacent wall/ceiling surface.

PART 3 EXECUTION

3.1 INSTALLATION

A. Set concealed frame type units flush with adjacent finished surfaces.

B. Position unit to provide convenient access to concealed Work requiring access.

C. Install fire-rated units according to NFPA 80 and requirements for fire listing.

3.2 SCHEDULES

A. Provide and install access panels where required by existing construction, utilities, etc.

B. Field coordinate requirements, sizes, and locations.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

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

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

C. Related Sections:
   1. Division 08 Section “Hollow Metal Doors and Frames”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
   1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
   2. ICC/IBC - International Building Code.
   3. NFPA 70 - National Electrical Code.
   4. NFPA 80 - Fire Doors and Windows.
   5. NFPA 101 - Life Safety Code.
   6. NFPA 105 - Installation of Smoke Door Assemblies.
   7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
   8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
   1. ANSI/BHMA Certified Product Standards - A156 Series.
   2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
   3. ANSI/UL 294 - Access Control System Units.
   4. UL 305 - Panic Hardware.
   5. ANSI/UL 437- Key Locks.

1.2 SUBMITTALS

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

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.
      c. Fastenings and other pertinent information.

d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.

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

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

D. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete access control and site management installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and telephone number of the supplier/integrator providing the installation and the nearest service representatives for each item of equipment included in the system. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

1. As-Built Drawings: During system installation, the Contractor to maintain a separate hard copy set of drawings, elevation diagrams, and wiring diagrams of the access control system to be used for record drawings. This set to be kept up to date by the Contractor with all changes and additions to the access control system accurately recorded.

E. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.3 QUALITY ASSURANCE

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

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

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

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

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

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

1.4 DELIVERY, STORAGE, AND HANDLING

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

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

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

1.5 COORDINATION

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

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

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

1.6 WARRANTY

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

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
   1. Structural failures including excessive deflection, cracking, or breakage.
   2. Faulty operation of the hardware.
   3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   4. Electrical component defects and failures within the systems operation.

C. Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
   1. Ten years for mortise locks and latches.
   2. Twenty five years for manual overhead door closer bodies.
   3. Two years for electromechanical door hardware, unless noted otherwise.

1.7 MAINTENANCE SERVICE

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

1.8 PRE-INSTALLATION MEETING

A. Establish final provisions related to security and key control. Examine hardware items of unusual provisions including special operational features, security devices, UL labels, and similar considerations related to installation.

B. Inspect and discuss preparatory work performed by other trades.

C. Review manufacturer's installation procedures related to the schedule of hardware, doors, and frames. Review the wiring diagrams for related electronic hardware and connection to the security access system and intended function.

PART 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
   1. Quantity: Provide the following hinge quantity:
      a. Two Hinges: For doors with heights up to 60 inches.
      b. Three Hinges: For doors with heights 61 to 90 inches.
      c. Four Hinges: For doors with heights 91 to 120 inches.
      d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
   2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
      a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
      b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
   3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
      a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
      b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
   4. Hinge Options: Comply with the following:
      a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
   5. Manufacturers:
      a. Hager Companies (HA) - BB Series, 5-knuckle.
      b. McKinney (MK) - TA/T4A Series, 5-knuckle.

c. dormakaba BEST (ST) - F/FBB Series, 5-knuckle.

2.3 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
   1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
   2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
   3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
   4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
   5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
   6. Manufacturers:
      a. Burns Manufacturing (BU).
      b. Rockwood (RO).
      c. Trimco (TC).

2.4 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
   1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
   2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
   3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
   4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
   5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
   6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
   1. Heavy duty surface mounted door closers shall have a 30-year warranty.
   2. Manufacturers:
      a. Sargent (SA) – 351 Series
      b. No Substitution.

2.5 ARCHITECTURAL TRIM

A. Door Protective Trim
   1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
   2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
   3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
   4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
      a. Stainless Steel: 300 grade, 050-inch thick.
   5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
   6. Manufacturers:
      a. Burns Manufacturing (BU).
      b. Rockwood (RO).
      c. Trimco (TC).

2.6 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
   1. Manufacturers:
      a. Burns Manufacturing (BU).
      b. Rockwood (RO).
      c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
   1. Manufacturers:
      a. Norton Rixson (RF).
      b. Rockwood (RO).
      c. Sargent Manufacturing (SA).

2.7 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

D. Manufacturers:
   1. National Guard Products (NG).
   2. Pemko (PE).
   3. Zero (ZE).

2.8 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.9 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical source power to verify actual locations of wiring connections before electrified and integrated access control door hardware installation.

C. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
   1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
   2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
   3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Door Closers:
1. Install closers on room side of corridor doors, and stair side of stairways.
2. Where through-bolts are required, install closers using only manufacturer-furnished through-bolts.
3. Install closers using only manufacturer-furnished template machine screws for metal doors and manufacturer -furnished wood screws for wood doors.
4. Coordinate with door supplier to provide proper blocking for surface mounting.
5. Use of self-drilling or self-tapping fasteners is not allowed.
6. Where full glazed door units are specified, use closer arm and mounting configuration as required to avoid use of drop brackets whenever possible.

E. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

G. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
   1. Quantities listed are for each pair of doors, or for each single door.
   2. The supplier is responsible for handing and sizing all products.
   3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
   4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. REFER TO DRAWINGS FOR HARDWARE SETS

C. Manufacturer’s Abbreviations:
   1. MK - McKinney
   2. PE - Pemko
   3. SU - Securitron
   4. RO - Rockwood
   5. SA - SARGENT
   6. HS – HES
   7. RF - Rixson
   8. NO - Norton
   9. OT - Other
   10. AK – Alarm Controls

END OF SECTION

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SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Gypsum board and joint treatment.
   2. Cement backer board

1.2 SUBMITTALS

A. Product Data: Submit data on gypsum board, accessories.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with:
   1. ASTM C840.
   2. GA-201 - Gypsum Board for Walls and Ceilings.
   3. GA-214 - Recommended Specification: Levels of Gypsum Board Finish.
   4. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
   5. GA-600 - Fire Resistance Design Manual.

B. Furnish framing materials in accordance with SSMA - Product Technical Information.

C. Surface Burning Characteristics:
   1. Textile Wall Coverings: Comply with one of the following:
      a. Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.4 MOCKUP

A. Gypsum Board Finish Mockups: Before finishing gypsum board assemblies, install mockups of at least 100 sq.ft. in surface area to demonstrate aesthetic effects and qualities of materials and execution.
   1. Install mockups for the following applications:
      a. Surfaces with texture finish.
      b. Level 4 and level 5 finish.
   2. Simulate finished lighting conditions for review of mockups.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected from weather, condensation, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum boards flat to prevent sagging.
   1. Protect joint compounds from freezing.

C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.6 FIELD CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C840 and with gypsum board manufacturer's recommendations. Do not install gypsum board when ambient temperature is below 40 deg. F.
   1. Do not install paper-faced gypsum boards until installation areas are enclosed and conditioned.

B. Ventilation: Ventilate building spaces, as required, for dry joint-treatment materials.

C. Do not install boards that are wet, those that are moisture-damaged, and those that are mold damaged.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Manufacturers:
   1. United States Gypsum Co. [basis of design]
   2. BPB Americas Inc.
   3. G-P Gypsum Corp.
   4. National Gypsum Co.
   5. Certainteed.

B. General Requirements: Comply with ASTM C 1396. Provide in maximum lengths and widths available that will minimize joints in each area, that will minimize joints in each area, and that correspond with support system indicated.
   1. Unless otherwise noted all gypsum board shall be fire-resistance-rated. Refer to Code Plan in Construction Drawings for specific locations and requirements of fire-resistance rated assemblies indicated.
   2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
   3. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 COMPONENTS

A. Gypsum Board Materials: ASTM C1396/C1396M; Type X fire resistant where indicated on Drawings.
   1. GB-1: Standard Gypsum Board: 5/8 inch thick, maximum available length in place; ends square cut, tapered and beveled edges.
   2. GB-2: High-Impact / Impact-Resistant Gypsum board: 5/8 inch thick, maximum available length in place; ends square cut, tapered and beveled edges.
   3. GB-3: Moisture Resistant Gypsum Board: 5/8 inch thick, maximum available length in place; ends square cut, tapered and beveled edges.

B. Cement Backer Board Materials: Complying with ANSI A118.9 and ASTM C1288 or 1325 of thickness indicated and in maximum lengths available to minimize end-to-end butt joints. Ends and edges shall be square cut and finished smooth; formed in a continuous process of aggregated Portland-cement slurry; and reinforced with vinyl coated, woven glass-fiber mesh embedded in both surfaces.
   1. CB-1: Cement Board: 1/2 or 5/8 inch thick, standard sizes.

2.3 ACCESSORIES

A. Acoustic Insulation: ASTM C665, preformed glass fiber, friction fit type, unfaced,
   1. 3 inch thick in 3 5/8 inch metal stud walls.
   2. 6 inch thick in 6 inch metal frame walls.

B. Gypsum Board Accessories: ASTM C1047; metal; corner beads, edge trim, and expansion joints.
   1. Metal Accessories: Galvanized steel.
   2. Edge Trim: Type LC, L, or U bead as appropriate for conditions

C. Joint Materials: ASTM C475/C475M, GA-201 and GA-216, reinforcing tape, joint compound, and water.

D. Fasteners: ASTM C1002, GA-216; length to suit application.

E. Gypsum Board Screws: ASTM C954, ASTM C1002; length to suit application.

1. Screws for Steel Framing: Type S.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions are ready to receive work.

3.2 INSTALLATION

A. Gypsum Board:
   1. Install gypsum board in accordance with GA-216 and ASTM C840.
   2. Fasten gypsum board to furring or framing with screws.
   3. Place control joints consistent with lines of building spaces as directed by Architect.
   4. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
   5. Seal cut edges and holes in gypsum board as appropriate for the condition.

B. Joint Treatment:
   1. Finish in accordance with GA-214 for all new work.
      a. Level 4: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener head and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.
         1) This level is to be used at areas to receive flat paints.
      b. Level 5: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer's recommendations, applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
         1) This level is to be used at areas to receive eggshell and semi-gloss and gloss paint and areas subject to severe lighting, where indicated.
   2. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   3. Feather coats onto adjoining/existing surfaces so camber is maximum 1/32 inch.
   4. Taping, filling, and sanding is not required at concealed surfaces**.**

C. Tolerances: Maximum Variation from Flat Surface: 1/8 inch in 10 feet in any direction.

3.3 SCHEDULE

A. New Gypsum Board Wall Finishes: GB-1: Level 4 finish.

B. New Gypsum Board Ceiling Finishes: GB-1: Level 4 finish.

C. New Gypsum Board Wall / Ceiling Finishes at Toilet Rooms, Wet Areas: GB-3: Level 4 finish.

D. Existing Walls / Ceilings: Repair existing gypsum board / plaster finishes where required by work and/or damaged. Restore to like new condition.

END OF SECTION

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Metal stud framing and accessories at interior locations.

1.2 SYSTEM DESCRIPTION

A. Interior Walls: Metal stud framing system with insulation as specified in Section 07 21 00 and as indicated on wall types on Drawings, interior gypsum board as specified in Section 09 21 16.

B. Maximum Allowable Deflection for wall assemblies: 1: 240 of the wall height based upon horizontal loading of 5 lbf/SF.

C. Design Loads: 5 lbf/SF minimum.

D. Design framing systems to accommodate deflection of the primary building structure and construction tolerances and to withstand design loads as outlined.

E. Wall System:
   1. Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   2. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.3 PERFORMANCE REQUIREMENTS

A. Select stud thickness to resist minimum 5 psf uniform load and maximum 1/240 deflection.

1.4 QUALITY ASSURANCE

A. Perform Work according to ASTM C754.

B. Form, fabricate, install, and connect components according to NAAMM ML/SFA 540.

C. Furnish framing materials according to SSMA - Product Technical Information.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Framing System Components: ASTM C645.

B. Studs: ASTM A653/A653M, non-load bearing rolled steel, channel shaped, punched for utility access, as follows:
   1. Depth / Thickness:
      a. 3 5/8 inches x 20 gauge
      b. 6 inches x 20 gauge
      c. Unless otherwise noted on the drawings, or as required to suit conditions to meet deflection requirements.

C. Joists: ASTM A653/A653M, non-load bearing rolled steel, channel shaped:
   1. Depth / Thickness:
      a. 6 inches x 20 gauge unless otherwise required by conditions.

D. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs.

E. Headers and Jambs: Metal stud manufacturers proprietary shape used to form headers and jambs, columns, etc.

F. Furring Channels: ASTM A653 G40
   1. Cold Rolled Channels: 16 gauge with 1/2 inch wide flanges, 3/4 inch deep.
   2. Hat Channels: ASTM C645-07: 25 gauge, 7/8 inch deep

G. Channel Bridging:
   1. 16 gauge, 1-1/2 inch x 1/2 inch flange
   2. Clip angles: 1-1/2 inch x 1-1/2 inch, galvanized steel

H. Radius Framing: Steel sheet runner for non-load bearing curves, bends, variable radii, and arches, etc.

I. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.

J. Fasteners: ASTM C1002; Type S, GA-216; length to suit application.

K. Anchorage Devices: Power actuated.

L. Grid Suspension System of Interior Ceilings: ASTM C645-07, manufacturer's standard direct-hung grid suspension system composed of main beams and cross furring members that interlock forming a modular support system.

2.2 SUSPENSION SYSTEM COMPONENTS

A. Hangers, Tie Wires, Carrying Channels, and Furring Channels as required for suspended ceiling systems.
   1. Tie Wire: ASTM A641, Class 1 zinc coating, soft temper, 0.062 inch diameter wire, or double strand 0.048 diameter wire.
   2. Wire Hangers: ASTM A641, Class 1 zinc coating, soft temper, .016 inch diameter.
   3. Carrying Channels [Main Runners]: Cold formed, commercial sheet sheet with base steel thickness of 0.0538 inch and minimum 1/2 inch wide flanges. Depth as indicated on drawings.
   4. Design load shall be 5 times the imposed load by construction per ASTM E488.

B. Grid Suspension System of Interior Ceilings: ASTM C645-07, manufacturer's standard direct-hung grid suspension system composed of the main beams and cross furring members that interlock to form a modular supporting network.
   1. Contractor’s Option for gypsum board ceilings where appropriate.

2.3 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

C. Fit and assemble in largest practical sections for delivery to Site, ready for installation.

2.4 SHOP FINISHING

A. Studs: Galvanize to G40 coating class.

B. Tracks and Headers: Galvanize to G40 coating class.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify rough-in utilities are in proper location.

3.2 INSTALLATION - GENERAL

A. Installation Standard: ASTM C754.
   1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

F. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

G. Align stud web openings horizontally.

H. Secure studs to tracks using fasteners. Do not weld.

I. Stud splicing not permissible.

J. Brace stud framing system rigid.

K. Coordinate erection of studs with requirements of door frames, window frames, and openings; install supports and attachments.

L. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical Work to be placed within or behind stud framing.

M. Blocking: Secure wood blocking or steel channels to studs.

N. Refer to Drawings for indication of partitions extending to finished ceiling only and for partitions extending through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Install extended leg ceiling runners.

O. Coordinate placement of insulation in stud spaces after stud frame erection.

3.3 INSTALLATION OF FRAMED ASSEMBLIES

A. Install framing system components in accordance with spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
   1. Single-Layer Application: As required by horizontal deflection performance requirements, 16 inches o.c. unless otherwise indicated.
   2. Multilayer Application: As required by horizontal deflection performance requirements, 16 inches o.c. unless otherwise indicated.
   3. Tile Backing Panels: As required by horizontal deflection performance requirements, 16 inches o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
   1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
   2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
      a. Install two studs at each jamb unless otherwise indicated.
      b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.

c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
6. Curved Partitions:
   a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
   b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches o.c.

E. Direct Furring:
1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

3.4 INSTALLATION OF CEILING SUSPENSION SYSTEMS

A. Install suspension system components in accordance with spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
2. Carrying Channels (Main Runners): 48 inches o.c.
3. Furring Channels (Furring Members): 24 inches o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
   a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
   a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
5. Do not attach hangers to roof deck.
6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.5 ERECTION TOLERANCES

A. Maximum Variation from Indicated Position: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb: 1/8 inch in 10 feet.

3.6 SCHEDULES

A. Refer to wall types and sections on drawings.

END OF SECTION

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SECTION 09 30 00 - TILING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes porcelain tile, ceramic tile for interior floor and wall applications; metal edge and transition strips, and thresholds at door openings.

1.2 SUBMITTALS

A. Product Data: Submit product data for each type of tile, grout, and accessories.

B. Shop Drawings: Indicate patterned applications and thresholds.

C. Samples: Submit [2] samples of each tile and grout, illustrating pattern, color variations, and grout joint size variations.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with TCA Handbook and ANSI A108.1 Series/A118.1 Series.

B. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

C. Installer: Company specializing in performing Work of this section with minimum five years documented experience and approved by manufacturer.

1.5 MOCKUP

A. Build mockup, in place, to verify installation details and techniques. Mockup once approved by Architect and Owner shall remain in place and will be used as the benchmark for remaining installations.

1.6 ADDITIONAL MATERIALS

A. Furnish extra materials that match and are from the same production runs as the products installed. Package with protective covering for storage.
   1. Tile: Furnish tile and accessories in the amount of 5% for each type.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

PART 2 PRODUCTS

2.1 PRODUCTS – GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Source Limitation for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
   1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregates, from single manufacturer.

D. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1/.2, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
   2. For facial dimensions of tile, comply with requirements relating to tile sizes specified.

E. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced, ANSI standards referenced by TCNA installation methods specified in tile installation scheduled and other requirements specified.

F. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.2 TILE PRODUCTS

A. Refer to Finish Specifications on Drawings.

2.3 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

A. General: Manufacturer's product selected from the following, that complies with ANSI A118.10 and A118.12 for high (greater than 1/8 inch) performance and is recommended by the manufacturer for the application indicated. include reinforcement and accessories recommended by manufacturer.
   1. Chlorinated-Polyethylene Sheet Product
   2. PVC-Sheet Product
   3. Fabric Reinforced, Fluid Applied Membrane

2.4 CRACK-ISOLATION MEMBRANE

A. Manufacturer’s product selected that complies with A 118.12 for high (greater than 1/8 inch) performance and is recommended by the manufacturer for the application indicated.
   1. Fabric Reinforced, Fluid Applied Membrane
   2. Fluid Applied Membrane

2.5 WATERPROOFING ONLY MEMBRANES FOR TILE INSTALLATIONS

A. General: Manufacturer's standard product, selected from the following that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
   1. Provide waterproofing at showers that do not have a prefabricated receptor.
      a. Chlorinated Polyethylene Sheet
      b. PVC Sheet
      c. Polyethylene Sheet
      d. Fabric Reinforced Fluid Applied Membrane
      e. Fluid Applied Membrane

2.6 SETTING AND GROUTING MATERIALS

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15
      a. MAPEI Corporation; Kerabond T/Keralastic System
      b. LATICRETE SUPERCAP, LLC; 4-XLT
   2. Polymer-Modified, Unsanded Tile Grout: ANSI A118.7 and ISO 13007; CG2WA
      a. MAPEI; Keracolor U
      b. Laticrete; 600 Series/LATICRETE 1776
   3. Polymer-Modified, Sanded Tile Grouts: ANSI A118.7 and ISO 13007; CG2WA
      a. MAPEI, Keracolor S
      b. Laticrete: Laticrete 1500 Sanded Grout; Laticrete 1776 Grout Admix Plus

B. Mortar Bed Materials: ANSI A108.1A; Portland cement, sand, latex additive and water.
   1. Create mortar bed to accommodate difference in thickness of original floor materials and new floor materials.

C. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added to Project site.
   2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.15.

D. Polymer-Modified, High-Performance, Tile Grout: ANSI A118.7, color as indicated.
   1. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
      a. Unsanded grout mixture for joints 1/8 inch and narrower.
      b. Sanded grout mixture for joints 1/8 inch and wider.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

2.8 ACCESSORIES AND MISCELLANEOUS MATERIALS

A. Tile Backer Board: Refer to Section 09 21 16.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Metal Edge Strips, Terminations, and Transitions: Angle or L-shape, height to match tile and setting-bed thickness, metallic, designed specifically for floor and wall applications, satin anodized aluminum; sized and profiles to suit conditions and as noted on drawings. Meet accessibility requirements for transitions at floor applications.
   1. Schluter Systems or Equal

D. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
   1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
   2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

E. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

F. Floor/Grout Sealer: Manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify substrate mix design for additives i.e. hardeners, moisture vapor reduction admixture, and other ingredients that might affect performance of installed tile.
   2. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films or silicones, and curing compounds; and within flatness tolerances required by referenced ANSI A108 of tile installation standards for installations indicated.
   3. Verify that concrete surfaces for tile floors installed with bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.1 for installations indicated.
      a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
      b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
   4. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
   5. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected and manufacturer has approved substrate for material to be installed without compromise.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials, using mechanical methods recommended by manufacturer. Do not use solvents.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
   1. Remove protrusions, bumps, and ridges by sanding or grinding.
   2. All concrete substrates at least 28 days old, completely cured and free of hydrostatic conditions.
      a. If concrete additives have been included in the mix or suspected to be in the mix that might affect the performance of the flooring installation, test the bond.

1) Perform bond and additional tests as recommended by the TCNA and grout manufacturer. If tests do not produce satisfactory results, coordinate with concrete admixture manufacturer and grout manufacturer on possible solutions. Retest until a satisfactory result can be obtained.

C. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

D. Mortar Bed: Create mortar bed for setting of new floor tile to accommodate difference in thickness between existing finish floor and proposed finish floor. Field verify existing conditions.

E. Wall Preparation: Comply with ANSI A108.01, Section 2.5.

F. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

G. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
   1. Shower pan membranes shall extend 3 inches minimum above finished floor to form pan, unless otherwise noted.
   2. Materials adversely affected by moisture in areas immediately adjacent to showers or tubs shall be properly protected.
   3. All horizontal surfaces, for example shower seats, sills, curbs, etc. must slope towards drain or other surfaces sloped toward drain. Waterproofing must also be sloped.

B. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.4 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack-suppression membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
   1. Crack-suspension membrane must be installed over entire substrate.

B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

3.5 GENERAL INSTALLATION

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, and TCA Handbook recommendations.

B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base and wall joints to the extent possible

C. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated on drawings. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
   1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
   2. Where tiles are specified or indicated to be whole integer multiple of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

3. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.

D. 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.

3.6 ADJUSTING/CLEANING AND PROTECTING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove latex-portland cement grout residue from tile as soon as possible.
   2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
   3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

3.7 FLOOR TILE INSTALLATION

A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCNA installation methods and ANSI A108 Series of tile installation standards.

B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.
   1. Locate transition under doors, unless otherwise noted.

C. Floor/Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints,
   1. remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.8 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCNA installation methods and ANSI setting bed standards.

B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.
   1. Locate transition at corners and where indicated on drawings.

3.9 INTERIOR, FLOOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor
   1. Tile Installation: Interior floor installation on concrete; thin-set mortar; TCNA F113 (on-ground concrete) TCNA F113A (above-ground concrete) and ANSI A108.5.
      a. Tile Type: Unglazed ceramic mosaic tile.
      b. Thin-Set Mortar: Improved modified dry-set mortar.
      c. Grout: polymer-modified, high-performance unsanded grout.
   2. Tile Installation: Interior floor installation on waterproof membrane over concrete; thin-set mortar; TCNA F122A (elevated slabs) and ANSI A108.13.
      a. Tile Type: Unglazed ceramic mosaic tile.

b. Thin-Set Mortar: Improved modified dry-set mortar.
c. Grout: Polymer-modified, high-performance, unsanded grout.

3. Tile Installation: Interior floor installation on concrete; thin-set mortar on crack isolation membrane; TCNA F125-Full and ANSI A108.1.
   a. Tile Type: Unglazed paver tile.
   b. Thin-Set Mortar: Improved modified dry-set mortar.
   c. Waterproofing and Crack Suppression Membrane Installed: Full coverage of substrate.
   d. Grout: Polymer-modified, high-performance, sanded grout.

3.10 INTERIOR, WALL (BASE) TILE INSTALLATION SCHEDULE

A. Interior Wall Installations, Masonry or Concrete
   1. Tile Installation: Interior wall installation over sound, dimensionally stable masonry or concrete; thin-set mortar; TCNA W202I and ANSI A108.5.
      a. Tile Type: Unglazed ceramic mosaic and glazed wall tile.
      b. Thin-Set Mortar: Improved modified dry-set mortar.
      c. Grout: Polymer-modified, high-performance, unsanded grout.

B. Interior Wall Installations, Metal Studs or Furring:
   1. Tile Installation: Interior wall installation over glass-mat, water-resistant backer board; thin-set mortar; TCNA W245 or W248 and ANSI A108.5.
      a. Tile Type: Unglazed ceramic mosaic and glazed wall tile.
      b. Thin-Set Mortar: Improved modified dry-set mortar.
      c. Grout: Polymer-modified, high-performance, unsanded grout.

END OF SECTION

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SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Acoustic tile.
   2. Acoustic panels.
   3. Suspended metal grid ceiling system and perimeter trim.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data.

B. Samples: Submit ceiling tile and suspension system.

1.3 QUALITY ASSURANCE

A. Surface Burning Characteristics: Comply with the following when tested in accordance with NFPA 286.
   1. During 40 kW Exposure: No flame spread to ceiling.
   2. During 160 kW Exposure: No flame spread to perimeter of tested sample and no flashover.
   3. Total Smoke Release: Maximum 1,000 cu m.

B. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver material in the manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Provide labels indicating brand name, source of procurement, style, size and thickness.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

D. Handling: Handle materials to avoid damage.

1.5 PROJECT CONDITIONS

A. Coordination: Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.
   1. Review with affected installers those locations of facility services lines and equipment within ceiling plenum that prevent installation of hangers at spacings compliant with limitations established in referenced standards. Arrange for each affected mechanical or electrical installer to provide necessary number of additional structural support points for ceiling installer.

B. Maintain environmental conditions [temperature, humidity, and ventilation] within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

C. Sequencing: Schedule work of affected trades to minimize or eliminate installation conflicts and rework.

1.6 EXTRA MATERIALS

A. Provide 5% additional materials for each ceiling type for use by the Owner.

PART 2 PRODUCTS

2.1 SUSPENDED ACOUSTICAL CEILINGS

A. Manufacturers:
   1. Armstrong [Basis of Design]
   2. United States Gypsum Company.

B. Performance / Design Criteria:
   1. Provide system capable of supporting imposed loads with deflection limited to 1/360 of span.

2.2 COMPONENTS

A. Acoustic Tile ATC-1: ASTM E1264
   1. Armstrong Kitchen Zone
   2. Material: mineral fiber
   3. Nominal Size: 24 x 24 inches.
   4. Thickness: 5/8 inches.
   5. Surface Finish: Smooth
   6. Edge: Square.
   7. Color: White.
   8. NRC: N/A

B. Suspension Grid:
   1. Armstrong Prelude 15/16 inch suspension system
   2. Non-Fire Rated Grid: ASTM C635, standard duty, non-fire rated, exposed T configuration; components die cut and interlocking components with wall angles and moldings; transition trim, hold down clips, etc as required.
   3. Accessories: Stabilizer bars, clips, splices, edge moldings required for suspended grid system.
   4. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
   5. Exposed Grid Surface Width: 15/16 inch.
   6. Perimeter Molding Width: Match grid width.
   7. Grid Finish: White color.
   8. Suspension Wire: ASTM A580, 12 gauge
   9. Support Channels and Hangers: Galvanized steel, size and type to suit application and ceiling system flatness requirements specified.

2.3 CEILING PERFORMANCE REQUIREMENTS

A. Design for maximum deflection of 1/360 of span.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify layout of hangers does not interfere with other work.

3.2 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636 and manufacturer's instructions and as supplemented in this section.

B. Install hangers and inserts coordinated with overhead work. Provide additional hangers and supports as required.

C. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1/360.

D. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

E. Locate system on room axis according to reflected ceiling plan.

F. Suspension System, Nonseismic: 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, facility services, or equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels as applicable 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.

I. Do not eccentrically load system or induce rotation of runners.

J. Edge Moldings: Install at intersection of ceiling and vertical surfaces and penetrations, using components of maximum length; set level. Provide edge moldings at junction with other ceiling finishes; Miter corners; Provide preformed edge closures to match bullnosed cornered partitions.
   1. Use longest practical lengths.
   2. Miter; Overlap; or Overlap and rivet corners.

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. Fit edge trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

F. Where round obstructions; bullnose concrete block corners; and other penetrations occur, provide preformed closures to match perimeter molding.

G. Install hold-down clips where required adjacent to exterior doors.

H. Tolerances: Variation from Flat and Level Surface: 1/8 inch in 10 feet.

END OF SECTION

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SECTION 09 65 10 – RESILIENT TILE FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes resilient tile flooring and resilient base.

1.2 SUBMITTALS

A. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Samples:
   1. Submit manufacturer's complete set of color samples for initial selection.
   2. Submit **two** samples, illustrating color and pattern for each resilient flooring product specified.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning

1.4 QUALITY ASSURANCE

A. Surface Burning Characteristics:
   1. Floor Finishes: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.
   2. Base Material: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

B. Accessibility: Flooring shall comply with accessibility requirements ICC/ANSI A117.1.
   1. Exceed Federal Standards and ADA requirements for slip-resistance.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.
   1. Manufacturers Qualifications: Flooring product manufacturer will have a technical installation representative available at the job site at the start of the installation to insure there are no conditions which will compromise the installation of the material and that the material is being installed according to industry standards, practices and manufacturers guidelines. The manufacturer’s technical representative will document and confirm that the substrate, material, and installation are in compliance with manufacturer’s guidelines and accepted industry standards and practices.
      a. Any noticed defect with the product or installation system will require the response of the manufacturer’s technical field service personnel on site to determine cause, correction or replacement.

B. Installer: Company specializing in performing Work of this section with minimum ten years documented experience.

1.6 MOCKUP

A. Provide a mockup of the floor installation in an approximate 100 SF area showing the color and pattern of the floor, layout, seams, etc.

B. Provide a mockup of each type of floor / floor pattern as indicated.

C. Coordinate locations with Owner and Architect.

D. Approved mockups may be left in place.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by the manufacturer, but not less than 65 deg F or more than 85 deg F.

1.8 PROJECT CONDITIONS / ENVIRONMENTAL REQUIREMENTS

A. Install resilient products after other finishing operations, including painting, have been completed. If that is not possible due to the compressed schedule, provide all required protection of the floor system after installation until turnover of the space.

B. Maintain ambient temperatures within range recommended by the manufacturer, but not less than 65 deg F or more than 85 deg F in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

C. Maintain the ambient relative humidity between 40% and 60% during installation.

D. Until Substantial Completion, maintain ambient temperatures within range recommended by the manufacturer, but not less than 55 deg F or more than 85 deg F.

1.9 EXTRA MATERIALS

A. Furnish an additional 5% of each type of floor, base, and accessories.

B. Document attic stock, properly label, and turn over to Owner.

1.10 WARRANTY

A. Provide ten [25] year manufacturer warranty for all resilient tile flooring, and accessories.

PART 2 PRODUCTS

2.1 TILE FLOORING

A. Manufacturers:
   1. Shaw Contract [Refer to Finish Specs. Material provided by Owner]

B. Testing Requirements: ASTM F1700
   1. Slip Resistance ASTM D2047: ADA Compliant
   2. Static Load Limit ASTM F970: 1500 psi
   3. Residual Indentation F1914: passes , 8%
   4. Flexibility ASTM F137: Passes
   5. Resistance to Heat ASTM F1514: Passes
   6. Resistance to Light ASTM F1515: Passes
   7. Resistance to Chemicals ASTM F925: Passes
   8. Radiant Flux ASTM E648: / 0.45 W/sq. cm., Class I
   9. Smoke Density ASTM E662: Passes, <450

2.2 RESILIENT BASE

A. Manufacturers:
   1. Match existing
   2. Approved Equal.

B. Base: ASTM F1861 Type TP – Thermoplastic, Rubber; coved style:
   1. Height: 4 inch.
   2. Thickness: 0.125 inch thick.

3. Finish: Satin or Matte.
4. Length: 4 foot sections.
5. Outside Corners: Premolded or precut. Corners shall be a minimum of 4 inches in length each direction.
6. Inside Corners: Job formed

2.3 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: As determined by a qualified testing agency by testing identical products.
   1. Critical Radiant Flux Classification (ASTM E 648 or NFPA 253): Class I (not less than 0.45 watts per cm^2).
   2. Smoke Generation (ASTM E 662 or NFPA 258): Maximum specific optical density of 450 or less.

B. Accessibility: Flooring shall comply with accessibility requirements of ICC/ANSI A117.1 as required by local authorities with jurisdiction.
   1. Comply with ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring: Exceeds Federal Standards and ADA requirements for slip-resistance.

2.4 ACCESSORIES

A. Transition Moldings and Edge Strips, same material as flooring or metal as applicable. Refer to drawings.

2.5 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated and coordinate with substrate.

B. Primer: A primer may be required and must be verified by the manufacturer.

C. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated.
   1. Adhesives shall be approved by manufacturer for use over concrete substrates

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

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

D. Verify concrete floors are dry to maximum moisture content as recommended by manufacturer, and exhibit negative alkalinity, carbonization, and dusting.

E. Verify floor and wall surfaces are free of substances capable of impairing adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Provide all required field verification of conditions, quantity take-offs, layout confirmations, etc. as applicable to the work.

B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
   1. Prepare concrete substrates in accordance with ASTM F 710.

C. Prohibit traffic until filler is cured.

D. Clean substrate.

E. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances cannot be removed.

F. Do not install flooring products until they are same temperature as the space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 INSTALLATION – RESILIENT TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

C. Install tile to a pattern as indicated or as recommended by the manufacturer for the conditions. Allow minimum 1/2 full size tile width at room or area perimeter.

D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.

F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

G. Install flooring in recessed floor access covers. Maintain floor pattern.

H. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
   1. Prohibit traffic on resilient flooring for 48 hours after installation.
   2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

D. Wait 72 hours after installation before performing initial cleaning.

E. A regular maintenance program must be started after the initial cleaning.

END OF SECTION

SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and field application of paints, stains, varnishes, and other coatings.

B. Paint/Stain all exposed surfaces that are not pre-finished items, finished metal surfaces, operating parts, labels, or materials obviously intended to be left exposed such as brick and tile.
   1. CMU
   2. Steel and iron
   3. Galvanized metal
   4. Gypsum board.
   5. Hollow metal doors and frames
   6. Interior Wood Doors

C. Unless otherwise indicated do not paint concealed surfaces.
   1. Do not paint cabling, and protect communication cabling from overspray. Paint voids the warranty of cable and if painted shall be replaced at the painting contractor's expense.
   2. Do not paint fire alarm devices or sprinkler heads.

D. Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats. Primer and finish coat shall be factory applied, finish coat shall be field applied.

E. Extra Materials: Deliver to Owner any leftover paint materials, properly labeled.

F. Minimum surface temperature of 50 degrees required for all coating systems.

G. Store all materials in tightly closed containers when not in use, away from heat, electrical equipment, sparks and open flames. Use approved bonding and grounding procedures. Keep out of the reach of children and residents.

H. Transfer materials to approved containers with complete and appropriate labeling.

1.2 SUBMITTALS

A. Product Data and Color Samples: Provide product data on each coating system component indicating VOC and environmental requirements. Coordinate coating systems for each material/substrate.

B. Provide draw down samples of each coating for final review and approval by Owner.

1.3 QUALITY ASSURANCE

A. Conform to all work place safety regulations for storage, mixing, application, and disposal of all paint related materials.

B. Surface Burning Characteristics:
   1. Fire Retardant Finishes: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.4 REFERENCES AND REGULATIONS:

A. Standards: Comply with applicable provisions and recommendations of the following, except when otherwise shown or specified:
   1. OSHA Safety Standards for the Construction Industry
   2. SSPC Volume 1, Good Painting Practice,
   3. SSPC Volume 2, Systems and Specifications, Surface Preparation Guide and Paint Application Specifications of the Steel Structures Painting Council.

4. SSPC and NACE Painter Safety Guidelines, latest editions.

B. Requirements of Regulatory Agencies, conform with the following:
   1. Clean Air Act (CAA)
   2. Clean Water Act (CWA)
   3. Toxic Substances Control Act (TSCA)

1.5 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:
   1. Product name and type (description)
   2. Application & use instructions
   3. Surface preparation
   4. VOC content
   5. Environmental handling and an SDS
   6. Batch date
   7. Color number

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.

C. Handling: Maintain a clean, dry storage area to prevent contamination or damage to the coatings.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

1.8 MOCKUP

A. Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections and demonstrate aesthetic effects and set quality standards for materials and execution.

PART 2 PRODUCTS

2.1 PAINTS AND COATINGS

A. Manufacturers:
   1. Sherwin Williams [basis of design]

B. Paints and Coatings - General:
   1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOCs need to be confirmed by using the products EDS sheets.

C. Primers:
   1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

D. Coating Application Accessories:

1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and cleanup materials required per manufacturer's specifications.

E. Colors: As selected from a full range of manufacturer's offerings, including premium colors.

F. Contractor shall provide for a minimum of paint colors per the drawings.

G. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
1. Lead: Measurable lead content in either the pigment or binder will not be permitted.
2. The finish coats shall match colors selected.

H. Finish Quality:
1. Finishes shall exhibit a high quality, commercial grade appearance of uniform thickness.
2. Finishes shall be free of runs, sags, drips, waves, orange peel, festoons, dry spray, cloudiness, spotting, ropiness, brush marks, roller marks, fish eyes or other surface imperfections, voids, discontinuities, pinholes, holidays and overspray.
3. Final coat shall be uniform in texture, color and gloss, and shall provide an acceptable match with the approved drawdown sample sheet.

2.2 INTERIOR PAINT APPLICATION SCHEDULE

A. Metals - Ferrous: [Semi-Gloss Finish]
1. 1st Coat: S-W Pro Industrial™ Pro-Cryl® Universal Primer, B66-1300 Series (5.0 mils wet, 1.9 mils dry)
2. 2nd Coat: S-W Pro Industrial™ Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.2 mils dry per coat)
3. 3rd Coat: S-W Pro Industrial™ Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.2 mils dry per coat)

B. Metals – Aluminum / Galvanized: [Semi-Gloss Finish]
1. 1st Coat: S-W Pro Industrial™ Pro-Cryl® Universal Primer, B66-1300 Series (5.0 mils wet, 1.9 mils dry)
2. 2nd Coat: S-W Pro Industrial™ Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.2 mils dry per coat)
3. 3rd Coat: S-W Pro Industrial™ Semi-Gloss Acrylic, B66-650 Series (6.0 mils wet, 2.2 mils dry per coat)

C. Concrete Masonry Units [Semi-Gloss Finish]
1. 1st Coat: S-W Block Filler: SW Pro Industrial Heavy Duty Block Filler B42W00150
2. 2nd Coat: S-W Water Based Catalyzed Epoxy, Semi-Gloss.
3. 3rd Coat: S-W Water Based Catalyzed Epoxy, Semi-Gloss.

D. Gypsum Board Walls: [Semi-Gloss Finish]
1. 1st Coat: S-W ProMar® 200 Zero VOC Latex Primer, B28W2600 (4.0 mils wet, 1.0 mils dry)
2. 2nd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B31-1900 Series (4.0 mils wet, 1.5 mils dry per coat)
3. 3rd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B31-1900 Series (4.0 mils wet, 1.5 mils dry per coat)

E. Gypsum Board Walls: [Eg-Shel/Satin Finish]
1. 1st Coat: S-W ProMar® 200 Zero VOC Latex Primer, B28W2600 (4.0 mils wet, 1.0 mils dry)
2. 2nd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B20-1900 Series (4.0 mils wet, 1.7 mils dry per coat)
3. 3rd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B20-1900 Series (4.0 mils wet, 1.7 mils dry per coat)

F. Gypsum Board Ceilings: [Flat or Semi-Gloss Finish]
1. 1st Coat: S-W ProMar® 200 Zero VOC Latex Primer, B28W2600 (4.0 mils wet, 1.0 mils dry)

2. 2nd Coat: S-W ProMar® 200 Zero VOC Latex Flat, B30-12600 Series (4.0 mils wet, 1.4 mils dry per coat)
3. 3rd Coat: S-W ProMar® 200 Zero VOC Latex Flat, B30-12600 Series (4.0 mils wet, 1.4 mils dry per coat)

2.3 PRE-CLEANING AND SURFACE PREPARATION PRODUCTS

A. Pre-cleaning Agents
   1. SW No Rinse Prepaint Cleaner
   2. Krud Kutter
   3. Potable water

B. Pre-cleaning (Power Wash) Equipment
   1. Capacity to continuously deliver 3-5 gpm at 2,500 psig of 180-200 degree F hot water.
   2. Cleaning system shall affect the 32-ounce per gallon dilution.
   3. Manufacturer: Alkota, Model 565T with model 520 water heater or approved equal.
   4. Power wash with 15 degree tip capable of delivering hot water at 2500 psig.

C. Power Tool Surface Preparation Media:
   1. Scotch Brite No. 07451 by 3 M Corporation, Surface Conditioning disc.
      a. Texture: A Medium
      b. Maximum Speed: 18,000 RPM
   2. Clean ‘N" Strip Disco No CSD2 by 3 M Corporation
      a. Texture: Course
      b. Maximum Speed: 8,000 RPM

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin application of coatings until substrates have been properly examined and prepared. Notify Architect of unsatisfactory conditions before proceeding.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

D. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

A. Comply with paint manufacturer's written instructions for surface preparation, environmental and substrate conditions, product mixing, and application.

B. Perform all surface preparation in accordance with SSPC specifications, guidelines and good painting practices.

C. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.

D. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.

E. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

F. Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised.

G. Mildew may be removed before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

H. Methods:
   1. Block (Cinder and Concrete): Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75°F unless the manufacturer's products are designed for application prior to the 30-day period. The pH of the surface should be between 6 and 9 unless the products are designed to be used in high pH environments. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.
   2. Galvanized Metal: 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-SP16 is necessary to remove these treatments.
   3. Steel: Structural, Plate, etc.: Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.
   4. Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
   5. Hand Tool Cleaning, SSPC-SP2: Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before Hand Tool Cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

3.3 APPLICATION

A. Examination and Verification of Condition: Contractor shall verify the areas and conditions under which the work is to be performed and notify the Owner in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until satisfactory conditions have been corrected. Do not coat over chalk, dirt, scale, moisture, oil, surface contaminants, coatings that have exceeded the manufacturer's re-coat guidelines, or conditions otherwise detrimental to the formation of a durable high quality coating system.

B. Comply with manufacturer's instructions and SSPC Good Paint Practices Volumes 1 and 2.

C. Comply with OSHA regulations, State of Ohio and Federal laws, ordinances, and guidelines.

D. Follow manufacturer's requirements for temperature and humidity at time of application.

E. Refer to SDS sheets before using any product.

F. All surfaces must be thoroughly dry before coating applications. Do not apply to wet or damp surfaces.
   1. Wait at least 30 days before applying to new concrete or masonry or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
   2. Test new concrete for moisture content.

G. Apply coatings using brush or roller only.

H. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

I. Apply coatings using methods recommended by manufacturer.

J. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

K. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

L. Regardless of number of coats specified, apply as many coats as necessary for complete hide.

M. Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to the application of each coat.

3.4 CLEAN UP

A. Clean site and remove debris and empty cans daily. Remove all paint from adjacent surfaces. Clean spills and splatters immediately.

B. Clean hands and tools immediately after use with soap and water for water based products and with mineral spirits for oil based products.

C. Follow manufacturer's safety recommendations when using mineral spirits.

3.5 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Plastic interior panel signs for room identification.

1.2 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Shop Drawings: Detail drawings showing sizes, lettering and graphics, construction details of each type of sign and mounting details with appropriate fasteners for specific project substrates.

C. Manufacturer's Installation Instructions: Printed installation instructions for each signage system.

D. Message List: Signage report indicating signage location, text, and sign type.

E. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and available pictograms, characters, and Braille indications.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum three years documented experience in work of this Section.

B. Installer Qualifications: Minimum three years documented experience in work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in unopened factory packaging.

B. Inspect materials at delivery to verify there are no defects or damage.

C. Store products in manufacturer's original packaging until ready for installation in climate controlled location away from direct sunlight.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Install products in an interior climate controlled environment.

B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 INTERIOR SIGNAGE

A. Manufacturers
   1. ASI Sign Systems
   2. Diskey Architectural Signage
   3. Nova Polymers
   4. Equal

2.2 PERFORMANCE REQUIREMENTS

A. General Requirements:
   1. Comply with all applicable provisions of the ANSI A117.1 Accessibility Requirements.
   2. Character Proportion: Letters and numbers on signs must have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.
   3. Color Contrast: Characters and symbols must contrast with their background - either light characters on a dark background or dark characters on a light background.
   4. Raised Characters or Symbols: Letters and numbers on signs must be raised 1/32 inch minimum and be sans serif characters. Raised characters or symbols must be at least 5/8 in high but no higher than 2 inches. Symbols or pictograms on signs must be raised 1/32 in minimum.
   5. Symbols of Accessibility: Accessible facilities required to be identified must use the international symbol of accessibility.
   6. Braille: Type II with accompanying text.

2.3 MATERIALS

A. Acrylic Sheet: ASTM D4802, Category A-1 cell-cast sheet; Type UVF [UV filtering]

B. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.

C. Molded Plastic Characters: Thermoformed or injection molded
   1. Laminated impact acrylic sheet signage:
   2. Finish: non-Glare
   3. Engraving Method: Rotating carbinde
   4. Thickness: 1/8 inch
   5. Engraving Depth: 0.012
   6. Braille: Type II, Raised room numbers
   7. Colors: to be selected, 2 colors, with contrasting color scheme
   8. Installation: Adhered

2.4 INTERIOR SIGNS

A. Acrylic Panel, fabricated in accordance with one of the following methods:
   1. Inlayed acrylic signs
      a. Acrylic sheet shall be CNC cut to specifications with square or radius corners, and/or custom shapes, 0.080 inch minimum.
      b. 1/32 inch modified acrylic plate shall be adhered to the acrylic plate with a high bond chemical adhesive and the text and/or symbols shall be CNC cut to specifications.
      c. Corresponding text and/or symbols shall be CNC cut from 1/16 inch modified acrylic embedded 1/32 inch and bond with chemical adhesive to the acrylic plate.
      d. Domed grade 2 Braille shall be embedded in the surface.
      e. Comply with requirements indicated for material, color, finish, design, shape, size, and details of construction.
   2. Double panel (window) sign with changeable insert(s).
      a. Tactile appliqué: Opaque, single ply, modified acrylic sheet not less than 0.032 inch in thickness.
      b. Braille: Braille dots shall consist of 0.0625 optically clear UV stable acrylic spheres.
      c. Face laminate: Clear, non-glare, cast acrylic sheet not less than 0.080 inch in thickness.
      d. Backing sheet: Expanded PVC sign board or acrylic sheet not less than 0.125 inch in thickness.
      e. Changeable insert: Provide one of the following:
         1) Polystyrene not more than 0.032 inch in thickness with pressure sensitive vinyl copy or digitally printed graphics.

2) 0.020 inch thick clear lexan with vinyl letters.

B. Interior Panel Sign Types:
1. Provide capacity signs for rooms constituting a place of assembly.
a. Provide capacity sign on the interior of all assembly spaces indicating “MAXIMUM CAPACITY XX OCCUPANTS”. For number of occupants, refer to Room Finish Schedule.
2. Toilet Room Handicapped Signs: Provide one sign depicting International Men/Women Symbol along with the words “Men” or “Women” indicated on the sign at each toilet room, equipped with facilities for the handicapped.
3. Interior Room Name and Number Signs
a. Layout of room name and number shall be as directed by the A/E.
b. Number of signs required:
1) Doors off halls, corridors, and passages.
2) All spaces listed in Finish Schedule. If more than one door to a space, a sign will be required for each door.
c. Provide signs with clear acrylic nameplate as indicated on Signage Types.
4. Storage Signs: Provide signs at mechanical, electrical rooms to read as follows: “COMBUSTIBLE STORAGE NOT PERMITTED”
5. Equipment Intended for the Use of the Fire Department or Other Emergency Responders: Provide signs identifying and locating the following equipment. Locate signs in corridors near rooms containing the following:
a. Air-conditioning systems.
b. Sprinkler risers and valves.
c. Other fire-detection, -suppression, or -control elements.

C. Contractor to provide temporary signage as needed to obtain final inspections for building permits.

2.5 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.
1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
2. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
3. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.
4. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Subsurface-Applied Graphics: Apply graphics to back face of clear faced-sheet material to produce precisely formed image. Image shall be free of rough edges.

C. Shop and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fish mouths.

2.6 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install signs and accessories, using mounting methods of types described and complying with manufacturer's written instructions.
   1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
   2. Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
   3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
   4. Install signs so they do not protrude or obstruct according to the accessibility standard.

B. Accessibility Signs: Installation height and location shall comply with applicable provisions in the U.S. Architectural and Transportations Barriers Compliance Board’s ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.
   1. Height above finish floor or ground: Tactile characters on signs shall be located 48 inches minimum above the “finish” floor or ground surface, measured from the base line of the lowest tactile character and 60 inches maximum above the finish floor or ground surface, measured from the baseline of the height tactile character.
   2. Location: Where a tactile sign is provided at a door, the sign shall be located alongside the door latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign is provided at double doors with two active leafs, the sign shall be located to the right of the right hand door. Where there is no wall space at the latch side of a single door or at the right side of double doors, signs shall be located on the nearest adjacent wall. Signs containing tactile characters shall be located so that a clear floor space of 18 inches minimum by 18 inches minimum, centered on tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

END OF SECTION

SECTION 10 21 13 - TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Phenolic toilet compartments.

1.2 SUBMITTALS

A. Product Data: Panel construction, hardware, and accessories.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and ceiling supports, door swings.

C. Samples: Two compartment samples, illustrating panel finish, color, and sheen.

D. Manufacturer's Instructions: Special procedures, perimeter conditions requiring special attention.

E. Qualifications Statements:
   1. Qualifications for manufacturer and installer.
   2. Manufacturer's approval of installer.

1.3 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

1.4 WARRANTY

A. Furnish twenty five-year manufacturer's warranty for defects in material and workmanship.

PART 2 PRODUCTS

2.1 SOLID PLASTIC TOILET COMPARTMENTS

A. Manufacturer List:
   1. ASI Global Partitions: Black Phenolic Core [Basis of Design]
   2. Approved Equal.

B. Toilet Compartments: Floor Set, Overhead Braced

C. Urinal Screen: Wall hung with floor brace.

D. Door, Panel, and Pilaster Construction: Solid phenolic-core material with melamine facing on both sides fused to substrate during manufacture (not separately laminated), and with eased and polished edges. Provide minimum 3/4-inch- thick doors and pilasters and minimum 1/2-inch- thick panels. Provide with no-sightline system consisting of door and pilaster lapped edges on strike side of door and door and pilaster lapped edges on hinge side of door (unless continuous hinge is used).

E. Pilaster Shoes and Sleeves: Manufacturer’s standard design, stainless steel.
   1. 22 gage stainless steel with satin finish, 3 inch height.

F. Brackets:
   1. Full Height Continuous Type, unless otherwise noted. Manufacturer’s standard design, extruded aluminum or stainless steel.
   2. Provide stirrup type, ear, or U-brackets, clear anodized aluminum or stainless steel at accessible units as required to provide a minimum 32 inch wide clear width with the door open at 90 degrees.

G. Doors and Divider Panels: Privacy stile, no sightlines / gap free

1. Nominal 58 inch high doors, mounted 12 inches above the finished floor.
2. Dividing Panels: slotted on one edge to accept wall bracket.

H. Sightlines: Provide brackets and components to provide no minimum sightlines.

I. Phenolic Compartment Finish:
   1. Dark Color Phenolic: Manufacturer's standard dark color core and edge
   2. Facing Sheet Color: As selected by Architect from full range of available colors.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design [commercial grade], heavy-duty operating hardware and accessories. Clear anodized aluminum or stainless steel.
   1. Hinges: concealed, self closing type, adjustable.
   2. Thumbturn latch, with emergency access, accessible type at accessible compartments. Provide visual indicator at public side of compartment.
   3. Door strike and keeper with rubber bumper
   4. Coat Hook, mounted on door panel, rubber tipped, sized to prevent door from hitting compartment mounted accessories.
   5. Door Pulls: locate at both sides of doors for accessible compartments, at pull side of standard compartments.

B. Anchorages and Fasteners: manufacturer's standard exposed fasteners of stainless steel or chrome plated steel or brass, finished to match hardware, with theft-resistant type heads.

2.3 FABRICATION

A. Fabricate toilet compartments to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.

B. Floor-Anchored Units: Manufacturer's standard corrosion-resistant anchoring assemblies at pilasters and walls, with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.

C. Overhead-Braced Units: Provide manufacturer's standard corrosion resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit conditions. Make all required provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.

D. Doors: provide doors sized as indicated on drawings. Provide required clearance for accessible compartments.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify:
   1. Field measurements are as indicated on Shop Drawings.
   2. Correct spacing of and between plumbing fixtures.
   3. Correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install compartments rigid, straight, level, and plumb. Secure compartments in position with manufacturer's recommended anchoring devices.

B. Maintain maximum of 1/2 inch space between wall and panels and between wall and end pilasters.

C. Floor-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Level, plumb, and tighten pilasters. Hang doors and adjust so tops of doors are level with tops of pilasters when doors are in closed position.

D. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with not less than two fasteners. Hang doors to align tops of doors with tops of panels and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

E. Wall-Hung Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb and to resist lateral impact. Attach panel brackets securely to walls using anchor devices.

3.3 TOLERANCES

A. Maximum Variation from Indicated Position: 1/4 in.

B. Maximum Variation from Plumb: 1/8 in.

3.4 FIELD QUALITY CONTROL

A. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.5 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 in.

B. Adjust hinges to position doors in partially open position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

3.6 CLEANING

A. Clean partition and screen surfaces with materials and cleansers according to manufacturer's recommendations.

END OF SECTION

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SECTION 10 28 00 – TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Toilet accessories.

1.2 SUBMITTALS

A. Product Data: Accessories, describing size, finish, details of function, and attachment methods.

1.3 QUALITY ASSURANCE

A. Accessibility Requirements: Comply with requirements applicable in the jurisdiction of the project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.
   1. Where the bottoms of units are between 27 and 80 inches above the finished floor, accessories mounted on or in the wall cannot protrude more than 4 inches into a clear access aisle.

1.4 WARRANTY

A. Furnish fifteen-year manufacturer's warranty for mirror glass and stainless steel mirror frames.

PART 2 PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

A. Manufacturer List:
   1. Bobrick
   2. ASI
   3. Bradley
   4. Schluter
   5. Approved Equal

B. Performance Requirements
   1. Accessibility Requirements: Comply with requirements applicable in jurisdiction of project, including but not limited to ADA and ICC/ANSI A117.1 requirements as applicable.
      a. Where bottoms of units are between 27 and 80 inches above finished floor, accessories mounted on or in wall cannot protrude more than 4 inches into a clear access aisle.
   2. Structural Performance: Accessories and fasteners to comply with the following requirements:
      a. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.
      b. Shower Seats: Installed units are able to resist 250 lbf applied in any direction and at any point.
   3. 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.
      a. Hand Dryers: Certified to Underwriters Laboratories (UL); bear UL or ETL markings.

2.2 MATERIALS

A. Stainless Steel: ASTM A 240 or A 666, Type 304, 0.0312-inch minimum nominal thickness, unless otherwise indicated.

B. Steel Sheet: ASTM A 1008, Designation CS (cold-rolled, commercial steel), 0.0359-inch minimum nominal thickness.

C. Galvanized-Steel Sheet: ASTM A 653, with G60 hot-dip zinc coating.

D. Galvanized-Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.

E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper and-theft resistant where exposed, and of galvanized steel where concealed.

F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0-mm thick.
   1. Provide mirror furnished with a uniform plastic film 8 mils nominal thickness with acrylic adhesive which is moisture resistant and non-corrosive, meeting 16 CFR 1201-11 and ANSI 297.1 requirements category II tape back.

H. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.3 FINISHES

A. Stainless Steel: No. 4 satin brushed finish, unless otherwise indicated.

B. Chrome/Nickel Plating: ASTM B456, Type SC 2, polished finish, unless otherwise indicated.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats electrostatic-baked enamel.

D. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.

2.4 TOILET ROOM ACCESSORIES [COORDINATE WITH DRAWINGS]

A. Toilet Paper Dispenser: surface mounted, Provided and installed by Contractor.

B. Paper Towel Dispenser: surface mounted / semi-recessed per schedule, Provided and installed by Contractor.

C. Waste Receptacle: surface mounted / semi-recessed per schedule, provided and installed by Contractor

D. Soap Dispenser: wall mounted, Provided and installed by Contractor

E. Mirrors: Stainless-steel-framed, 6-mm-thick float glass mirror, provided and installed by Contractor
   1. Size: as indicated on Drawings.
   2. Frame: 0.05 in angle shapes, with mitered**,** welded and ground smooth corners, and tamper-proof hanging system; satin stainless steel finish.
   3. Backing: Full mirror sized, galvanized steel sheet and nonabsorptive filler material.

F. Grab Bars: Stainless steel, 1-1/2 in outside diameter, minimum 0.05 in wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 in clearance between wall and inside of grab bar, provided and installed by Contractor
   1. Length and configuration: As indicated on Drawings.

G. Sanitary Napkin Disposal Unit: surface mounted, Provided and installed by Contractor

H. Toilet Seat Cover Dispenser: surface mounted, Provided and installed by Contractor

I. Pipe Wrap: Provided and installed by Contractor

J. Shower Curtain Rods: Provided and installed by Contractor.

K. Shower Seat: Provided and installed by Contractor.

L. Shower Shelf: Provided and installed by Contractor.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify:
   1. Exact location of accessories for installation.
   2. Field measurements and rough-in dimensions for recessed accessories are as indicated on product data or as instructed by manufacturer.

B. Coordinate locations for installation of blocking, reinforcing plates, concealed anchors in walls.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to Site for timely installation.

B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

A. Do not install accessories until after completion of all finishes to adjacent wall and ceiling surfaces.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Turn over to Owner all keys and special tools required for lockable or secured accessories.

D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on Drawings:

3.4 CLEANING

A. Clean mirrors and exposed surfaces using procedures as recommended by accessory manufacturer.

END OF SECTION

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SECTION 10 50 00 - LOCKERS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Lockers

1.2 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Rated capacities, construction details, material descriptions, dimensions of individual components, profiles, and finishes.
   3. Delivery, storage, handling, and installation instructions and recommendations.
   4. Assembly and installation instructions.
   5. Description of specialties and accessories.
   6. Maintenance instructions and recommendations.

B. Shop Drawings:
   1. Show fabrication and installation details. Distinguish between factory and field work.
   2. Include plans, elevations, sections, details, attachments and work by others.
   3. Show system layouts, room locations, clearances, spacing, and relationship to adjacent construction.
   4. Show trim and accessories.

C. Closeout Submittals:
   1. Operation and Maintenance Data: For adjusting, repairing and replacing components and accessories.
   2. Warranty: Submit manufacturer's sample warranty.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain required factory units through one source from a single approved manufacturer.

B. Manufacturer Qualifications: Minimum 5 years experience in manufacture of similar products in use in similar environments, including project size, and complexity, and with the production capacity to meet the construction and installation schedule.

C. Installer Qualifications: Manufacturer's authorized representative, trained and approved for installation of units required for this Project.

D. Regulatory Requirements: Where components are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities".

1.4 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original unopened containers with manufacturer's labels attached.

B. Do not deliver components until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after roughing-in, painting and other finishing work has been completed, installation areas are ready to accept work.

C. Handle and install materials to avoid damage.

1.6 PROJECT CONDITIONS

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

B. Field Measurements: Verify field measurements as indicated on Shop Drawings. Where measurements are not possible, provide control dimensions and templates.
   1. Coordinate installation and location of blocking and supports as requested.
   2. Verify openings, clearances, storage requirements and other dimensions relevant to the installation and final application.

C. Coordination:
   1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.7 WARRANTY

A. Special Warranty: Manufacturer's written warranty to repair or replace components that fail in materials or workmanship. Failures include the following:
   1. Fracturing or breaking components including panels, shelves, or hardware resulting from normal wear and tear and use other than vandalism.
   2. Collapse or failure of metal grid locker components not resulting from overloading or vandalism.
   3. Delamination or other failures of bonding or assembly.
   4. Warping not resulting from leaks, flooding, or other uncontrolled moisture or humidity.
   5. Faulty operation of hardware and accessories.

B. Locker Warranty Period: 10 years.

PART 2 PRODUCTS

2.1 LOCKERS

A. Manufacturer:
   1. Penco Products, Vanguard, Vanguard [Basis of Design]
   2. Republic
   3. Lyon
   4. Scranton Products

2.2 MATERIALS

A. Steel: Prime grade mild cold-rolled sheet steel free from surface imperfection, capable of taking a high-grade enamel finish and in compliance with ASTM A1008.

B. Steel: Sheet steel components shall be fabricated using zinc-coated steel free from surface imperfection, capable of taking a high-grade enamel finish and in compliance with ASTM A879.

C. Bolts and Nuts: Zinc plated truss fin head bolts and hex nuts.

2.3 STANDARD DUTY LOCKERS

A. Standard Duty Lockers:
   1. Acceptable Product: Penco Vanguard, The Executive.
   2. Tops, Bottoms, Backs, Sides, and Shelves: 24 gauge sheet steel.
   3. Doors 20 inches or higher: 16 gauge sheet steel.
   4. Doors less than 20 inches high: 18 gauge sheet steel.
   5. No legs – set on locker base.

B. Locker Body: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
   1. Tops and bottoms with three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.
   2. Shelves with four sides formed to 90 degrees, front edge having a second bend.
   3. Hole spacing in locker body construction: Not exceeding 9 inches.
   4. Form door frame members to a channel shape, not less than 16 gauge steel.
   5. Provide vertical door frame members with additional 3/8 inch flange as a continuous door strike.
   6. Mortise and tenon intermembering parts; electrically weld together in a rigid assembly capable of resisting strains.
   7. Securely weld cross frame members of channel shapes to vertical framing members to ensure rigidity, including intermediate cross frame on double and triple tier lockers.
   8. Center partitions: 24 gauge steel vertical partitions, full depth between bottom and shelf.

C. Locker Doors: One piece sheet steel.
   1. Multi-Point Latch Doors: Full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates.
   2. Provide holes for attaching number plates.
   3. Doors over 15 inches wide by 60 inches or 72 inches high: 3 inch wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch centers.
   4. Box Lockers: Channel formations on lock and hinge sides, right angle flanges on top and bottom; pre-punch doors for padlock latch and friction catch and built-in combination and key locks.
   5. Ventilation: Provide louvered doors in manufacturer's standard louver pattern.

D. Hinges:
   1. Two inch high, 0.074 inch thick sheet steel, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door with two steel rivets.
      a. Doors over 48 inches high: Three 2 inch high five-knuckle hinges.
      b. Doors over 24 inches wide: Four 2 inch high five-knuckle hinges.
      c. All other doors: Two 2 inch high five-knuckle hinges.

2.4 DOOR HANDLES AND LATCHING

A. Two Person and Duplex Lockers, 1, 2 and 3 Tier: Multi-point latching:
   1. Chrome-plated zinc alloy die-cast case and handle, 40,000 psi maximum tensile strength.
   2. Attachment to latch bar concealed inside door and tamperproof; pulling handle out shall move latch bar up and open door in one motion.
   3. Padlock Eye: For use with 9/32 inch diameter padlock, integral with handle and located so that extension of handle forms padlock strike.
   4. Case: Kick-proof type shielding movable part and providing padlock strike to prevent scratching and marring the door.
   5. Provide lock hole cover plate for use with padlocks.
   6. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
      a. Doors over 48 inches High: Three points.
      b. All other Doors: Two points.
   7. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
   8. Firmly secure rubber silencers in frame as required.
   9. Classic III Multi-point latching with recessed handles:
      a. Recess finger-lift control handle in door.

b. Pocket: brushed stainless steel securely fastened to door with two tabs and a positive tamper-resistant decorative fastener; of depth sufficient to prevent a combination padlock, built-in combination lock, or key lock from protruding beyond door face.
c. Provide lock hole cover plate for use with padlocks.
d. Attach 14 gauge formed steel lifting piece to latching channel with one concealed retaining lug and one rivet, assuring a positive two-point connection.
e. Handle finger lift: Molded, sound-deadening, attached with rivet; padlock eye for use with 9/32 inch diameter padlock shackle.
f. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
   1) Doors 60 inches and 72 inches high: Three points.
   2) Doors 20 inches to 48 inches high: Two points.
g. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
h. Firmly secure one rubber silencer in frame at each latch hook.

2.5 ACCESSORIES

A. Number Plates: Provide each locker with a polished aluminum number plate, 2-1/4 inches wide by 1 inch high, with black numerals not less than 3/8 inch high; attach to face of door with two aluminum rivets.

B. Closed Bases: 18 gauge closed metal front and end bases, finished to match lockers.

C. Continuous Sloped Hoods: 16 gauge steel, slope rise equal to 1/3 of the locker depth plus a 1 inch vertical rise at front.
   1. Slip joints without visible fasteners at splice locations.
   2. Provide necessary end closures.
   3. Finish to match lockers.

D. Finished End Panels: Minimum 16 gauge steel formed to match locker depth and height, 1 inch edge dimension; finish to match lockers; install with concealed fasteners.

E. Front Fillers: 20 gauge steel formed in an angle shape, with 20 gauge slip joint angles formed in an angle shape with double bend on one leg forming a pocket to provide adjustable mating with angle filler.
   1. Attachment by means of concealed fasteners.
   2. Finish to match lockers.

F. Zee Bases for Knock-Down Lockers: 14 gauge, steel flanged outward at top for support of lockers, flanged inward at bottom for anchoring to floor. Height: 4 inches.

G. Recess Trim: 18 gauge steel, 3 inch face dimension.
   1. Vertical and/or horizontal as required.
   2. Standard lengths as long as practical.
   3. Attach to lockers with concealed clips.
   4. Provide necessary finish caps and splices.
   5. Finish to match lockers.

H. Benches: Laminated selected hardwood, 1-1/4 inch (31 mm) full finished thickness, corners rounded and sanded, surfaces finished with two coats of clear lacquer.
   1. Depth: 12 inches deep.
   2. Lengths: As shown.

I. Heavy-Duty Bench Pedestals: Steel tubing with 11 gauge steel flanges welded to each end, 16-1/4 inches high, finish to match lockers.

2.6 FABRICATION

A. Fabricate lockers square and rigid, without warp, with metal faces flat and free of distortion.

B. Knock-Down Lockers: Fabricate lockers on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments. Verify dimensions and arrangement before fabrication.

C. Finish: Enamel powder coat paint finish electrostatically applied and properly cured to manufacturer's specifications for optimum performance. Finishes containing volatile organic compounds and subject to out-gassing are not acceptable.
   1. Color: As selected from manufacturer's standard colors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrates and conditions for compliance with manufacturer requirements for installation, surface conditions.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.3 ADJUSTING AND CLEANING

A. Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily.

B. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.

C. Touch-up with factory-supplied paint and repair or replace damaged products before substantial Completion.

END OF SECTION

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PLUMBING

SECTION 15400

INDEX

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PLUMBING

SECTION 15400

1. NOTE

   A. The requirements of Division 1 apply to all work hereunder.

2. SCOPE

   A. The work included in this contract shall consist of the furnishing of all labor, material, equipment, and incidentals which may be necessary for the installation, test, adjustment, and guarantee of the plumbing work as shown on the drawings and specified hereinafter. All work shall be done in strict accordance with all applicable Local, State and Federal codes and regulations including the recommendations of the NFPA and the requirements of the NEC. In no case shall work be installed in violation of applicable codes.

3. DESCRIPTION OF WORK

   A. Below is a listing of the principal categories of work under this section. Note, however, that this listing is for general information only and work will not necessarily be limited to these categories. The detailed drawings and the following specifications cover the full extent of the work.

      1. Connections and/or revisions to sanitary drainage and vent system.

      2. Connections and/or revisions to domestic water supply system.

      3. Plumbing work in existing building as indicated on the drawings.

      4. Rough-in and final connections for plumbing fixtures.

      5. All demolition work as indicated on the drawings.

      6. All plumbing fixtures, trimmings, etc.

   B. All labor, material, tools, scaffolding and transportation which may be required to complete the work and carry it to a successful conclusion ready for operation when turned over to the Owner.

   C. Test and guarantee of all work installed under this contract.

4. SITE INVESTIGATION

   A. Prior to bidding, visit the job site and investigate all details which may have any effect on the installation, progress, or operation of the project.

B. When a bid is received, it will be assumed that the bidder has made the job site visit(s) and is familiar with the conditions as they may exist, and the modifications required to be made in order to provide a fully integrated system as specified.

C. At project start-up, certain areas will be designated for the storage of materials and equipment and cooperation with the Owner in minimizing interference with existing operations will be mandatory.

5. BIDDING

A. All bids shall be based upon furnishing and installing the make of materials and apparatus specified herein WITHOUT SUBSTITUTION, in order that all bids may be properly compared.

6. TEMPORARY WATER SERVICE

A. Maintain water service to building at all times. Contractor shall use existing service basins and/or hose bibbs for construction water. The owner shall pay for water used by contractors.

7. MAINTENANCE OF EXISTING FACILITIES

A. Maintenance of existing facilities for the present building(s) shall be required. The actual length of time for any interruption shall be held to an absolute minimum. At least 72 hours in advance of any severance of any services or facilities due to modification of pipe and/or equipment, submit a plan to the Engineer and the Owner, detailing the nature and estimated duration of the interruption and the method of procedure. Do not under any circumstances proceed with an interruption of service without the Owner's authorization.

B. Where alterations or additions to the existing building are indicated, this work shall include all removal, rerouting, or replacement of all existing facilities located in pipe spaces or walls being removed, as may be necessary to permit operation of a complete working system or systems where applicable to the trade jurisdictions involved in this section of the specifications.

C. Where an item of equipment is to be removed, all incidental piping, tubing, accessories, etc., associated with the equipment shall also be included where it will no longer function as part of the operating system.

D. All piping, etc. that has been rerouted or otherwise disturbed shall be insulated as required to match existing.

E. Where existing facilities are permanently abandoned, each outlet branch, etc. shall be removed completely (back to the main, when possible) and plugged or capped. All abandoned services shall be terminated well behind adjacent finished surfaces.

F. Unless otherwise mentioned, all material, equipment, etc. removed under this contract heading shall be disposed of in a proper and legal manner.

8. DRAWINGS

A. The drawings prepared for this project are an outline to show where pipes, equipment, apparatus etc. should be located in order to fit within the confines of available space and minimize conflicts with other trades. All work must be installed in accordance with the drawings insofar as possible. All drawings shall be carefully checked during the course of bidding and construction. If any discrepancies, errors, omissions or overlaps with other trades are discovered prior to or during the construction phase, notify the Engineer immediately for interpretation or correction. Note that an overlap with another trade does not relieve the contractor from the obligation of performing the work indicated on the drawings for this section of the project unless written notification stating such is obtained from the Engineer.

B. Take all necessary measurements and be responsible for same, including clearances for all materials and equipment that will be furnished. The Architect/Engineer shall reserve the right to make minor location changes of piping and/or equipment where such adjustments are deemed desirable from an appearance or operational standpoint. Such changes will normally be anticipated sufficiently in advance to avoid extra work or unduly delay progress on the project.

9. SPECIFICATIONS

A. Specifications shall be interpreted in conjunction with the drawings hereinbefore described and if anything is shown on the drawings and not mentioned in the specifications or vice versa, it is to be included in the work the same as though clearly set forth by both. Should there be a conflict between the plans and specifications, the greater quantity or better quality shall be furnished.

B. Should an overlap of work between the various trades become evident, the Engineer shall be notified. Such an event shall not relieve any trade of the responsibility for the work called for under his branch of the specifications until a written clarification or directive is issued concerning the matter.

10. PERMITS, FEES, INSPECTIONS, LAWS, AND REGULATIONS

A. Obtain and pay for all permits required in connection with this section of the work. In addition, pay all necessary inspection fees or similar charges.

B. Additional fees, charges, etc. imposed by other contractors and/or tradesmen, professional consultants, etc., for services rendered in connection with performing any portion of the work under this section shall be included as part of the work.

11. SHOP DRAWINGS

A. Prepare or obtain from the manufacturer, certified shop, or erection drawings of all items of equipment to be furnished under this section and submit copies of same as required for review. This shall be done as soon as possible, well prior to proceeding with installation or construction and in the proper sequence to avoid delays in the work, the work of the Owner or other contractors. Unless otherwise indicated, a minimum of six (6) hard-copies OR one (1) electronic set shall be submitted. These drawings shall be complete in every respect, showing pertinent details of size, capacities, arrangement, fittings, piping, kinds and thickness of materials, weight, loading required, clearances for service, maintenance, etc. Departures or deviations, if any, from the specifications, listed performance data, etc., shall be called out on the submittals. Note that in the following items of this specification, where more than one equipment manufacturer is listed, the first named has been used as the basis for design. All departures or deviations in material, performance, service requirements, size, construction, etc. from first named by the make submitted shall be noted on the shop drawings. **NOTE:** Where departures or deviations from the specifications do occur, the contractor shall additionally itemize same on the cover sheet that accompanies the submittals. Failure to do so will risk subsequent delay or rejection at the job site. (With regard to voluntary substitutions, refer also to Item BIDDING in this specification.).

1. By submitting such drawings, the Contractor represents that he has selected and verified all equipment, taken necessary field measurements, noted field construction criteria, etc., or will do so, and has checked and coordinated the information with the requirements of the Work and the Contract Documents.

B. The review of shop drawings shall not be construed as a complete check but will indicate only that the capacity, general method of construction and/or detailing is satisfactory.

C. Submittals shall be itemized on a standardized shop drawing submittal form and shall bear the contractor's review stamp as evidence that the items have been initially checked for compliance with Contract Documents as stated above.

D. After review, shop drawings will be returned marked in one of the following ways:

1. "NO EXCEPTIONS NOTED" - Copies may be distributed as required for construction, shipment, etc. to proceed.

2. "EXCEPTIONS NOTED" - Contractor may proceed with and/or authorize construction, shipment, etc. taking into account the necessary corrections.

3. "EXCEPTIONS NOTED - REVISE AND RESUBMIT" - Contractor will be required to resubmit shop drawings in their entirety. No fabrication,

erection or installation shall be authorized or initiated until shop drawings so marked have been completely revised, resubmitted, and subsequently marked in accordance with either of the two preceding sub-paragraphs. Only shop drawings officially marked "NO EXCEPTIONS NOTED" or "EXCEPTIONS NOTED" will be permitted on the jobsite.

E. Upon return of submittals take appropriate action as specified above. Note that if an insufficient number of copies has been submitted, no review will take place until all required copies have been received.

F. Where resubmittal is required, four (4) copies will be so noted by the reviewer, of which two (2) copies will be returned for corrections one (1) copy for the contractor and one (1) copy for the supplier/subcontractor).

G. The following is a list, where applicable, of items requiring submittals.

1. Drains
2. Plumbing Fixtures and Equipment

H. Fixtures and equipment requiring color selection shall be accompanied by color sheets or finish selection to make the Architect/Owner aware of the finishes and colors available.

I. Submittals and Shop Drawings for manufactured items shall be manufacturer's printed literature. Equipment selection shall be within manufacturer's printed recommended ratings.

J. A complete set of shop drawings shall be filed on the job site. Such drawings shall be readily available for reference.

12. CONTRACTOR'S FOREMAN

A. With reference to the work under this section a competent foreman shall be assigned to the project. The foreman shall remain on the job during all normal working hours until the project is complete and shall be authorized to act as the Contractor's agent in the absence of said Contractor. He shall not be relieved of his duties on this project except by permission or by request of the Architect.

13. WARRANTIES

A. Provide warranties to the Owner that all materials and equipment furnished are new, unless otherwise specified, and that all work is of good quality, free from faults and defects and in conformance with the Contract Documents.

B. Warranties on all work and equipment shall commence on the date of substantial completion of the work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. These warranties shall be in writing and,

along with all related documents, shall be submitted prior to the issuance of any certificates of acceptance. Warranties shall include equipment manufacturers' one (1) year non-prorated warranty certificates or other extended warranties as well as the contractor's one (1) year warranty statement for the project. This documentation shall be submitted in an appropriately marked, 3-ring hard cover binder.

C. If, within one (1) year after the date of substantial completion of the work or within one (1) year after acceptance by the Owner or within such longer period of time as may be prescribed by the terms of any applicable special warranty specified for a particular equipment item, any work is found to be defective, malfunctioning or not in accordance with the Contract Documents, it shall be promptly corrected upon receipt of official notification to do so. This obligation shall survive termination of the contract. Note that the term work shall be taken to include all equipment provided under the contract as well as materials and workmanship.

14. PROTECTION

A. Provide proper protection to the building during the execution of all work involved under this contract heading. This protection shall include covering all apparatus, building surfaces and/or other materials to protect same from dirt; adequate temporary connections to protect apparatus from damage of any sort; and required shielding to protect finished parts of the building.

B. Provide protection from damage for plumbing fixtures before, during and after their installation. Plumbing fixtures shall not be used for the storage of tools or materials nor as a support or platform. Every precaution shall be taken to avoid damage to fixtures and fittings.

C. During installation and until final connections are made, all piping shall be protected against entry of foreign matter. Equipment connections shall be tightly sealed until system tie-in.

15. TESTING AND INSPECTION

A. Test all systems, equipment or apparatus installed under this contract in the presence of the Owner's representative and, where required, in the presence of the plumbing inspector or other governing authorities. Necessary repairing or replacing of defective work shall be done immediately.

16. RECORD DRAWINGS

A. Provide and keep on the job site two complete print sets of the contract working drawings on which shall be legibly recorded any variations or alterations from such contract drawings made during construction. Record prints shall show location of all piping system drains as well as changes in:

1. Size, type, capacity, etc., of any material, device, or item of equipment...

2. Location of devices or equipment...

3. Location of outlet or source in building service systems...

4. Routing of piping or other building services...

5. Schedule data...

B. During the course of the project these prints shall be updated weekly and kept clean and undamaged. They shall not be used for any purpose other than as described above and shall be available at all times for inspection.

C. When the job is completed, these prints shall be submitted to the Engineer for study/review and electronic file update before being turned over to the Owner.

D. After the job is completed, these prints shall be presented to the Owner to provide an accurate and permanent record of location for the material and equipment actually installed.

17. MATERIALS AND WORKMANSHIP

A. Materials used in this contract shall be those specified herein unless proposals for the use of alternate materials have been submitted and accepted, in writing, as provided hereinbefore. Materials shall be strictly first grade of their kind and shall be new and in first class condition when installed.

B. Exact locations of electric outlets, piped equipment, piping, lighting fixtures, ducts, etc., shall be coordinated so there will be no interference at installation between the various trades.

C. Exposed screw pipe in the finished parts of the building shall be put together so as to conceal the threads and at completion must be left clean. Tool marks will not be permitted on any exposed metal, fixture or fitting.

D. Joint preparation for copper piping installations shall be in accordance with IAPMO Installation Standard IS3. All solder joints shall conform to the requirements of ANSI B9.1. They shall be made using tin-silver solder (Fed. Spec. #QQ-S-571E, Class SN96) for smaller sizes thru 1-1/4" and solder with high elongation properties and a melting point (liquidus) in excess of 600º F with a wide plastic range for piping sizes 1-1/2" and 2".

1. All pipe, fittings, solder or flux used in the potable water system shall be “lead-free” and comply with NSF 61-G requirements.

E. Valves to be installed with a welding or brazing operation shall have all internals removed, prior to installation, where required to avoid the possibility of damage from excessive temperature.

18. CLEANUP

A. All rubbish resulting from the work herein specified shall be removed from the premises at the end of each working day.

B. Upon completion of the work, remove from the project site all tools, equipment, surplus materials, and all remaining rubbish pertaining to the work under this contract heading. Responsibility for this shall include all related costs for such removal and disposition including hauling, dumping, etc.

C. By this time all extraneous labels, tags, etc., as well as other markings on equipment and ductwork not field insulated shall be removed.

19. CUTTING AND PATCHING

A. All cutting and/or drilling of walls, slabs, structural members, etc., required in conjunction with work under this section shall be performed as part of the work and shall be done under the supervision of the General Contractor. It shall be neatly done, without unnecessary removal of material. Holes, openings, etc., shall be located where they will not weaken the structure.

B. Patching of any work, where necessary, shall be performed by mechanics of the appropriate trade in order to achieve a workmanlike job. When the need for such patching or repairs arises, it shall be accomplished under this section at no additional cost to the Owner.

20. INSERTS AND SLEEVES

A. Inserts (concrete expansion anchors) shall conform to applicable requirements of Federal Specification FF-S-325. Embedment, anchor length and size shall be in accordance with manufacturer's recommendations. Anchors 3/8" thru 3/4" shall be U.L. listed for pipe hangers.

B. In general, pipe sleeves thru outside walls shall be of minimum 16 gauge galvanized steel or PVC pipe and shall be large enough to permit packing with picked oakum. The final 3" from the inside and outside faces of the wall shall be caulked with lead or waterproof plastic. Note that sleeves are not required for holes drilled in poured concrete walls.

C. Sleeves shall be provided for pipe openings cut in masonry walls as well as for similar openings in non-masonry walls, partitions, etc. Sleeves shall be of galvanized sheet metal with flanged ends and shall be securely mounted in place. Voids between masonry and sleeve shall be filled with mortar. In rated walls,

openings between pipes and structure, wall or sleeve shall be filled with firestop sealant to produce a fire, smoke, and water barrier as described below.

D. Provide thimbles wherever exposed pipes, tubing, conduit, etc., pass thru interior non-masonry walls, partitions, etc. They shall be telescoping type, made from 22 ga. galvanized sheet metal and of minimum size. Thimble ends shall have cast or stamped metal plates attached thereto. Floor penetrations shall be lined with thimbles extending above the floor line.

E. Floor, roof, and rated wall penetrations are to be sealed with an approved fire, smoke, and water barrier sealant. Material shall be noncombustible as defined by ASTM E-136 and shall maintain its integrity and dimensional stability while preventing the passage of flame, smoke, etc. under conditions of installation and use when exposed to the ASTM E-119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Sealant material shall be by Specified Technologies, Inc. It shall be tested to ASTM E-814, UL 2079 or UL 1479 for specific fire rated construction conditions. Install in accordance with manufacturer's recommendations.

F. Any required openings thru roof structure shall be carefully and located in designated areas only. Pitch pockets shall be utilized as required to eliminate any chance of moisture penetration. They shall be made from 16 oz. sheet copper (ASTM B 370, temper H00) and shall extend approximately 4" above the finished roof.

21. FIRESTOPPING

A. Furnish and install the required firestopping as referenced in the item of the specifications covering inserts and sleeves. Materials, installation, etc., shall be as described below. Products shall be as manufactured by Hilti, Inc., Specified Technologies Inc., or United States Gypsum Co.

B. Definition:

1. Firestopping is defined as the material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, water, and hot gases through penetrations in fire rated wall and floor assemblies.

C. Application:

1. Tested firestop systems shall be used for all penetrations for the passage of ductwork and piping through floors, fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

D. Quality Assurance:

1. A manufacturer's direct representative (not distributor or agent) shall be on site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

2. Firestop system installations must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated. In addition, proposed firestop materials and methods shall conform to applicable governing codes having jurisdiction.

3. For those firestop applications that occur for which no UL tested system is available through any manufacturer, a drawing representing the manufacturer's engineering judgment, derived from similar UL system designs or other tests, shall be submitted to local authorities having jurisdiction for review and approval prior to installation. Engineer judgment drawings must follow current requirements set forth by the International Firestop Council.

E. Submittals:

1. Manufacturer's submittals shall include specifications and technical data for each type of material including its composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 1300. The submittal shall also include material safety data sheets as well as any engineering judgement drawings previously approved by local authorities.

F. Installer Qualifications:

1. The firestop system installer must be certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary experience, staff, and training to install manufacturer's products per specified requirements as previously stated in Quality Assurance.

G. Requirements:

1. All holes, voids, miscellaneous openings, etc., made by penetrations in floor slabs (above grade) for systems provided under this section shall be completely sealed to insure water tight integrity. Installation of firestopping shall be scheduled after completion of penetrating item installation but prior to covering or concealing of openings.

2. Provide firestopping utilizing components that are compatible with adjacent surfaces, the substrates forming openings, and the items penetrating the firestopping under conditions of service and application as demonstrated by

the firestopping manufacturer, based on testing and field experience. Note that materials containing flammable solvents shall not be used.

H. Materials:

1. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each specific application.

2. For penetrations by combustible items (penetrants consumed by high heat and flame) including insulated metal pipe that is PVC jacketed, flexible cable or cable bundles and plastic pipe (closed piping systems), an Intumescent material is required to maintain fire rating of the assembly penetrated.

3. A firestop system with an "F" rating as determined by UL 1479, ASTM E814 or UL 2079, which is equal to the time rating of the construction being penetrated, must be utilized.

I. Preparation:

1. Surfaces to which firestop materials will be applied shall be examined for detrimental conditions. They shall be free of any substances that may effect proper adhesion.

2. Observe and comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

J. Installation:

1. Firestop materials shall be installed in accordance with published recommendations listed under the heading "Through-Penetration Firestop Systems" in the UL Fire Resistance Directory. In addition, the manufacturer's instructions for installation of through-penetration materials shall be strictly followed.

2. Consult with the engineer prior to installation of any UL firestop systems that might hamper the performance of fire dampers as they pertain to duct work.

K. Miscellaneous:

1. Sealed penetration areas shall be checked thoroughly to ensure proper installation before concealing or enclosing said areas.

22. SUPPORTS, HANGERS AND BRACKETS

A. All hangers, brackets, etc. for supporting material and equipment included under this section of the work shall be furnished and properly installed as required and as specified in the following. Material shall be as furnished by Anvil, Crane, Elcen, or Fee and Mason.

B. Pipe support spacing shall be in accordance with ANSI B3l.l.0. Piping shall be installed in such a manner that, where movement due to expansion and contraction could occur, it can freely take place except at anchor points. Supports shall be capable of vertical adjustment after erection of pipe. Pipe hangers, U-straps, clamps, pipe rolls, etc. shall be carried by threaded rods of a size determined by the support item locking device but in no case less than the size called for in the carrying capacity table for threaded rods listed in the ASME code for pressure piping. Supports and parts shall conform to the latest requirements of ANSI B31.1.0 and MSS Standard Practice SP-58, except as supplemented and/or modified herein.

23. DEMOLITION

A. Perform all demolition work as shown on the drawings and as specified herein or as may otherwise be required.

B. Where existing walls are demolished, any plumbing piping contained therein (that is not designated to be removed) shall be offset, relocated, or retained in place as may be required. This requirement applies to any situation that may be encountered during construction/demolition, even though it may not be shown on the drawings.

C. Patch and repair all areas damaged by demolition work as required to match surrounding surfaces.

24. EXCAVATION AND BACKFILL

A. Provide all required excavation and backfill, unless otherwise indicated, for the work involved under this section. The excavation shall be carried to the proper depth and grade, and shall form a firm, and proper base as required.

1. Provide and operate pumping equipment as necessary to keep trenches and other excavations free of water.

2. Shoring, bracing, sheathing, etc., shall be provided as necessary to ensure the safety of all personnel in accordance with OSHA requirements.

3. After installation has been made, approved where required by inspecting agencies, excavation shall be backfilled to the required subgrade level as required.

B. In all areas, unless designated otherwise, backfill shall consist of clean sand to 12" above top of pipe, the remainder of the excavation shall be backfilled with select

material. In no case will the use of organic material, large rocks or debris be permitted.

C. Remove and legally dispose of all surplus excavation and backfill material.

D. Restore 4” and provide troweled finish to accept new floor treatment.

25. CLEANING AND PAINTING

A. Clean all fixtures removing all labels and remove stains with whiting and alcohol.

26. PIPE STERILIZATION

A. Sterilize the entire domestic water distribution system prior to completion of the project. Sterilization shall be by means of chlorine injected into the system in an approved manner, near the source. Outlets thruout the system shall be tested to prove presence of minimum requirements. The sterilizing solution shall remain in the system for a period of 8 hours. Sterilization procedure shall be witnessed by the Architect or other qualified representative of the Owner.

B. The sterilizing solution shall contain not less than 50 parts per million of chlorine. Chlorinating material shall be either liquid chlorine conforming to U.S. Army Specifications 4 - 1, or sodium hypochlorite solution conforming to Federal Spec. O.B. 441a, Grade D.

C. The system shall then be flushed after completion with clean water until chlorine content is not greater than 0.2 parts per million, or until approved by the State Health Department.

D. Unless the Contractor can establish proof of expertise to the Owner's satisfaction for handling the above described operation, the Contractor shall hire, at his own expense, a company specializing in this procedure to perform the work.

27. FLASHING

A. Floor drain flashing shall be a 36" X 36" sheet of "Chloraloy 240" non-plasticized chlorinated polyethylene waterproofing membrane (min. thickness of 0.040"). The flashing shall be drawn into the clamping section of the drain and clamped securely.

B. The Chloraloy or Nobleflex as manufactured by the Noble Company shall be installed per manufacturer's recommendations.

28. PIPING

A. Piping shall be designed, fabricated, and installed in accordance with the American National Standards Code for Pressure Piping ANSI B31.1.0, latest edition, the Ohio Plumbing Code and the state piping codes, where applicable.

B. Pipe shall run straight between fittings and in straight horizontal and vertical lines, and parallel to building lines wherever possible. Ream ends of pipes to remove fins, burrs, etc., to full inside diameter and see that insides of pipes are clean before being placed in position. Open ends of pipe lines or equipment shall be properly capped or plugged until final connection to keep dirt or other foreign material out of the system.

C. Changes in direction and intersections of pipe lines shall be made with standard, specification type fittings as required and as called for hereinafter. Mitering of pipe to form elbows, notching straight runs to form tees or any similar procedure will not be permitted unless specifically mentioned in these specifications.

D. Consideration of and provisions for expansion and contraction in pipe lines thruout the system shall be part of this section of the work. Expansion loops, offsets, etc. which will properly care for the expansion may be used.

E. Piping shall be concealed in pipe shafts, pipe spaces, and furring, where possible. Prior to installation, determine that the proper space has been provided for pipes and exercise care in locating same in accordance with the requirements of the finish of various rooms.

F. Where piping is run exposed thru floors, walls, partitions or ceilings, furnish chromed escutcheons to cover the openings and provide a finished appearance. Escutcheons shall be securely fastened with set screws or other satisfactory means that will positively hold them in place against wall, floor, or ceiling.

G. Locate and install piping so 1/2" minimum clearance is maintained after insulation is applied.

H. Connection to plumbing fixtures shall be made using the proper method to eliminate strain due to expansion.

I. Pipe shall be tested as described in Item TESTING AND INSPECTION before connecting to equipment. Said equipment and piping shall then be connected as described in Item PIPE FITTINGS AND JOINTS.

J. Bullhead connections in any piping system are expressly prohibited.

K. Reductions in pipe sizes shall be made with reducing fittings and not with bushings.

L. All piping materials used on this project shall be those approved for use by the authorities having jurisdiction. Specific materials may have certain restrictions or exclusions as to their usage, including where they may or may not be located. All such regulations shall be adhered to where applicable.

M. Specific piping materials shall be as follows:

1. Sanitary/Vent:

    a. Coated cast iron hubless soil pipe and fittings conforming to CISPI 301 and ASTM A888 Standards.

        1. All cast iron pipe and fittings shall be made in the USA and marked with the CISPI mark C.I.

    b. Copper DWV tubing conforming to ASTM B306 Standards and wrought copper drainage fittings conforming to ANSI B16.29 Standards may be used for sanitary and vent piping above slab.

    c. PVC plastic pipe DWV Schedules 40, 80 and 120 conforming to ASTM D2665 or D2949 Standards may be used above grade within the building; However, its use will not be permitted in any ceiling spaces or mechanical shafts being utilized as supply or return air plenums.

    d. PVC plastic DWV pipe and fittings conforming to ASTM D 2665 or D 2949 Standards and installed per ASTM D2321 Standards may be used below grade within the building.

2. Water Piping Above Grade:

    a. Type L hard temper seamless copper water tubing conforming to ASTM B88 Standards with wrought copper fittings conforming to ANSI B16.22 Standards.

    b. Miscellaneous water piping branches below slab or installed in masonry walls shall be type K seamless copper water tube conforming to ASTM B88 Standards with wrought copper fittings conforming to ANSI B16.22 Standards. Soft copper shall be installed in concrete or below slab on grade, but in no case will concealed joints be permitted.

    c. No water lines shall be installed in exterior building walls.

    d. In lieu of the joining method using standard fittings with solder joints for domestic water lines, copper piping installations 2" and below may be installed using a machine crimp press fitting system utilizing engineered copper fittings and bronze unions. The press fittings, which shall incorporate a fitting bead and an elastomeric O-ring seal, shall have a listed temperature range of 0º to 250ºF at 200 psi and may be used with system pressures rated to 200 psi. Installation shall be in strict accordance with manufacturer’s

recommendations. Note: All materials in the potable water system shall comply with NSF 61-G.

29. PIPE FITTINGS AND JOINTS

A. Fittings for work thruout the project shall be of the type designed for the pipe on which they are to be used and shall conform to the general specifications outlined below.

B. Dielectric unions or couplings shall be used where dissimilar metals are joined and shall be located in accessible areas and/or where indicated on the plans.

C. Copper Piping:

1. Solder-joint wrot copper and cast bronze pressure fittings shall be used on copper tube piping. Wrot copper fittings shall be in accordance with ANSI B16.22 and shall be made from commercially pure copper and red bronze mill products per ASTM B75, Alloys 120 and 122. Note: All materials in the potable water system shall comply with NSF 61-G.

2. Cast bronze fittings shall be made to the requirements of ANSI B16.18 and material composition shall be in accordance with ASTM Specification B584. Flanges shall be minimum Class 150 and shall meet ANSI Standard B16.24 dimensions. Note: All materials in the potable water system shall comply with NSF61-G.

a. In lieu of wrot copper tees for copper tube piping at size reduction branch lines, mechanically formed tee connections may be utilized. The mechanically extracted collars for joining must be formed in one continuous operation. This shall consist of drilling a pilot hole and drawing out the tube surface to form a collar with a height of at least three times the thickness of the tube wall. The collaring device shall be fully adjustable to insure proper tolerance and complete joint uniformity.

b. The joining branch lines shall be notched and dimpled in a single process with two dimple/depth stops. The first depth stop insures proper penetration into the collar for brazing and the second dimple, 1/4" above the first, serves as a visual inspection point. Dimple/depth stops shall be in line with the run of the tube. All such joints shall then be brazed. (Soldered joints will not be permitted).

c. All mechanically formed branch collars shall meet the requirements of applicable sections of ANSI/ASME B31 and their use shall be approved by the local and/or state inspecting agencies having jurisdiction.

D. Machine crimp press fittings, where referenced in Item PIPING, shall be engineered press fittings that meet the material requirements of ASME B16.18 or ASME B16.22. The O-ring seal shall be of EPDM. The joining method shall be recognized by the ICC International Plumbing Code and BOCA National Plumbing Code as well as state and local codes. The fittings shall be designed for use with K, L and M hard copper tubing and shall be rated for service to 300 psi. Note: All materials in the potable water system shall comply with NSF 61-G.

E. Joints in cast iron no-hub soil pipe shall be made with neoprene gasket and either a cast iron clamp or stainless steel band fastened with stainless steel bolts. Stainless steel couplings shall be heavy duty type 304 stainless steel with minimum shield thickness of .016".

1. In lieu of the above, joints in cast iron no-hub soil pipe subjected to a static head of less than 40 feet may be made with neoprene gasket and either a cast iron clamp or stainless steel band fastened with stainless steel bolts conforming to CISPI-310 and ASTM C1277 Standards.

F. Joints in PVC drainage piping shall be solvent cemented in accordance with ASTM D2855 using solvent cement conforming to ASTM D2564 with a primer conforming to ASTM F656. Transitions from one approved plastics material to another approved plastics material are permitted only through the use of acceptable fittings designed for this purpose.

G. Joint preparation, brazing and solder methods, etc., for copper piping installations shall be as described in Item MATERIALS AND WORKMANSHIP.

H. For underground plastic pipe installation, the plastic piping may be installed using solvent cement or elastomeric seals. With solvent cement use only primers, cleaners and cements specified for the materials being used.

I. No paint, varnish, or other coating shall be permitted on the jointing material until after the joint has been tested and approved.

J. Joints of any materials not mentioned herein shall be made in accordance with accepted engineering practice. Conformity to applicable Standards will be considered prima-facie evidence of conforming to accepted engineering practice.

K. No threaded joints will be permitted in any underground piping.

30. DRAINS

A. Furnish and install drains as shown on the drawings and specified herein. The drains specified are based on a manufacturer whose catalog numbers have been used as criteria for type and description unless otherwise noted. The drains of the other manufacturers of equal quality and similar design shall be given the same

consideration as those listed. Acceptable manufacturers are Wade, Zurn, J.R. Smith, Watts or Josam.

B. All drains shall have cast iron bodies, drainage flanges and weepholes, unless noted otherwise. Furnish a flashing collar and flashing on all floor drains. See Item FLASHING for requirements.

31. CLEANOUTS

A. Cleanouts, caulked into proper branches, shall be provided where indicated or where required by local and/or state codes. Cleanouts shall be as manufactured by Wade, Zurn, J.R. Smith, Watts or Josam. Cleanouts shall be located for convenience and easy accessibility.

B. Cleanouts shall be provided as listed below:

1. Floor Cleanouts: Cast iron floor cleanout with adjustable housing, ferrule with speedi-set outlet and plug with neoprene seal. Furnish with flashing flange and clamping device for floors with membrane seals. Tops of cleanouts located in finished areas shall be secured and scoriated nickel bronze. Cleanouts shall be equal to the following J.R. Smith styles:

a. Finished Areas - 4111
b. Carpet Areas - 4031-Y/4031-X*

*As selected by Architect.

2. Wall Cleanout: J.R. Smith #4532, cleanout tee with countersunk tapped brass plug and round stainless steel cover with screw.

32. HAZARDOUS MATERIALS

A. This item of the specifications has been inserted to address the potential problem or problems occurring when hazardous materials (asbestos type insulations, etc.) are encountered on a project involving work in an existing structure and/or an existing system. Since the extent to which hazardous materials may have to be dealt with or whether, in fact, they will even be present on the site cannot always be determined prior to the actual demolition/construction phase of the project, the Owner will have the responsibility for dealing with the situation, should it arise.

B. If, during the course of the project, it is suspected that hazardous materials have been encountered or are present, contact the Construction Manager/Architect/Engineer immediately and cease work in the area(s) involved. The Owner will then make arrangements for the appropriate tests to be performed. If it is determined from these tests that hazardous materials are actually present, the Owner will deal with the situation in an appropriate manner before work in the affected area(s) resumes.

33. INSULATION

A. General Requirements:

1. All insulating materials, tapes, etc., for piping and equipment shall have composite fire and smoke hazard ratings, as tested by procedure ASTM E-84, NFPA 255, NFPA 258 and UL 723, not exceeding flame spread 25 and smoke developed 50 unless otherwise noted. Specific items of equipment that are factory insulated are not governed by this item of the specifications. Note that pipe insulation and coverings on pipe located in plenums and/or shafts serving to directly convey supply, return, or exhaust air shall have a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 50. However, pipe insulation and coverings installed in sealed chases and shafts or other similar concealed spaces, and in mechanical equipment rooms, shall have a flame spread rating not exceeding 25 and a smoke developed rating not exceeding 150. (See Note at the end of this Item.)

2. Insulation Index - Piping shall be covered with the classification and thickness of insulation noted in the Insulation Index listed in this item of the specifications.

B. General Instructions:

1. Before insulation is applied, all piping and equipment shall have been tested in accordance with specifications - see Item TESTING AND INSPECTION. Tests shall be verified by the Engineer before proceeding with the work.

2. Continue insulation thru walls, partitions, floors, and pipe sleeves unless otherwise indicated on drawings or prohibited by Code requirements.

3. Insulation manufacturer's names and product names that may appear in the specifications have been listed as a guide to manufacturer and/or a standard of quality. Products of equal quality and performance by other manufacturers will be considered on approval of the Engineer.

C. Adhesives, Coating and Vapor Barrier Materials:

1. All factory attached vapor barrier materials, and all adhesives, mastics, coatings, and insulation materials applied as herein specified shall have a dry flame spread index not to exceed 25 when tested in accordance with applicable Federal Standards.

2. Prior to use, submit certification by the manufacturer for each of the above materials used with respect to the flame index and toxicity.

D. Piping Insulation Index:

PIPING	CLASS	THICKNESS
Domestic Cold Water	C or G	1”
Hot Water	C or G	1”

1. NOTE: Class "G" insulation may be used in cramped or otherwise inaccessible areas on cold lines such as domestic cold water, etc.

E. Materials:

1. Class "C" Insulation

a. Nominal 4 pound density mineral fiber sectional pipe insulation wrapped with a factory applied ASJ jacket (similar to a Class "C" jacket) as manufactured by CertainTeed, Knauf, Johns Manville, Manson, Owens Corning or Schuller. The "k" factor shall be 0.23 or less at 75ºF mean. Product shall conform to ASTM C 1136 (jacketing), ASTM C 547 and shall meet UL 723 ratings. Published temperature range shall extend from 0º F to 800º F or greater. At installation, all longitudinal and circumferential (butt) joints shall be closed and sealed in accordance with manufacturer's instructions. The use of staples is permitted only in hot pipe insulation in concealed locations at contractor's option. Note that for exterior applications, the insulation shall have an all weather (AWJ) jacket consisting of a factory-applied weather-resistant jacket reinforced with fiber glass fabric.

b. On insulated pipe lines, all fittings, flanges, valves, etc. shall be covered with premolded/mitered fiberglass insulating units equal to the thickness of adjacent pipe insulation. Note that on lines subject to sweating, all of the above described work shall be given a flooding coat of vapor barrier mastic. Finally, all exposed fittings, valves and flanges shall be provided with preformed molded PVC jacket covers, as manufactured by CertainTeed, Knauf or Johns Manville. Covers shall be white with gloss finish, shall be UL 25/50 rated and shall meet the requirements of ASTM D 1784, Class 14253-C. Mechanical fasteners shall be of stainless steel.

2. Class "G" Insulation

a. Flexible, elastomeric foam insulation (tubular or sheet) - Armstrong "AP Armaflex" or equal by NOMACO, Schuller or Rubatex. The "K" factor for this material shall be 0.27 or less at 75º F mean and the published temperature range shall extend from -40º F or below

to at least 210º F. On thicknesses thru 1" the flame spread rating shall be 25 or less and the smoke developed rating shall be 50 or less based on ASTM E-84. Tubular material shall be pre-slit longitudinally with mating surfaces adhesive coated and protected by release liners. All other joints shall be butted and sealed with approved adhesive. Fabricate segments for valves and fittings and install according to manufacturer's recommendations. Outdoor piping insulation and lines that are exposed in mechanical rooms, etc. shall be given two coats of a white, water-based, semi-gloss latex enamel specifically formulated for this type of application.

F. Coverings:

1. Class "C" - Jacket: All service type (ASJ) to be a white, embossed foil, vapor-barrier laminate. Water vapor perm rating not to exceed 0.02 perms (ASTM E96, Proc. A) Tensile strength to equal or exceed 75 lbs./in.

2. The above described material shall be tested and rated in accordance with ASTM C411, ASTM C518, ASTM E84, ASTM E136 and the UL 910 flammability test. Note that the flame spread and smoke developed ratings shall not exceed 5 when tested to ASTM E84.

3. This pipe wrap shall be installed in strict accordance with the manufacturer’s written instructions.

4. Note:

a. In view of the fact that one of the classes of insulation listed above (Class F) does not meet the smoke developed rating criteria of 50 or less, its use will not be permitted for this project unless letter(s) of approval from the inspection agencies involved accompany the insulation submittals. Letter(s) must state specifically where its use will be permitted.

34. VALVES

A. Valves of each type furnished on this project shall be of one make and each valve shall have manufacturer's name and trademark together with design working pressure (Class) clearly indicated on the body.

B. Ball Valves (Domestic Water System):

1. Valves shall be in accordance with the following and shall incorporate a stainless steel ball, multiple rings of Teflon impregnated packing and high tensile stem. Body shell/wall thickness to be in accordance with requirements of ANSI B16.34. Lever handle shall be of nickel plated or

stainless steel with plastic grip. Quarter turn of handle shall rotate ball from full open to full closed position.

2. On lines 2" and under, valves shall be bronze with 316 stainless steel ball and blow-out proof stem. They shall be rated 600 psig WOG, cold non-shock. Body shall be single piece with threaded ends or two piece with solder ends and shall incorporate an adjustable packing gland and replaceable reinforced Teflon seat. Valves shall be in conformance with Federal specification WW-V-35C.

3. Valves shall be as manufactured by Apollo, Flow-Tek, Grinnell, Hammond, Jamesbury, Kitz, Milwaukee, Nibco, Victaulic, Watts, W-K-M or Worcester. Install in accordance with manufacturer's recommendations including disassembly of sweat end valves. Note that valves for use in the potable water service shall comply with NSF 61 Annex G & NSF 372.

C. Balancing Valves:

1. Balancing valves for domestic hot water low flow return line applications (1/2 gpm) shall be globe style valves designed for precise regulation and control at flow rates below 1 gpm and rated 240 psi for bronze at 250ºF. Valves shall be constructed of dezincification resistant brass (DZR) or bronze alloy complying with NSF 61 Annex G & NSF 372. Each valve shall have two metering/test ports with internal check valves and with attached protective caps. All valves must equipped with visual position readout and concealed memory stops for repeatable regulation and control. Valves shall be Nibco T or S1810LLF or approved equal globe style valve.

2. Balancing valves for domestic hot water return line applications shall be globe style valves for precise regulation and control and rated 175 psi for iron and 240 psi for bronze at 250º F. Valves 1/2" to 2" shall be constructed of dezincification resistant brass (DZR) or bronze alloy complying with NSF 61 Annex G & NSF 372. Valves over 2-1/2" will be constructed of iron with ANSI Class 125/150 flanged or grooved ends. Each valve shall have two metering/test ports with internal check valves and protective caps. All valves must be equipped with visual position readout and concealed memory stops for repeatable regulation and control. Valves shall be Nibco T or S1810LF (1/2" - 2"), or approved equal globe style valve.

35. UNIONS

A. Unions shall be provided wherever necessary to facilitate connecting to apparatus and installing necessary fittings.

B. Copper lines shall, in general, utilize sweat-end unions. They shall be solder joint cast bronze unions, Chase #C-402 or approved equal.

C. Dielectric (insulating) unions for piping systems involving steel-to-copper connections 2" and under shall have a steel union nut with end to meet ASTM B88. Steel parts shall be zinc plated to applicable Standards set by Federal Specifications and pipe threads shall be in accordance with ANSI B2.1. Insulating polymer gaskets for standard hot water applications shall be suitable for water service at continuous temperatures of 210º F. Unions shall be rated at 250 psi working pressure.

D. Note: All material used in potable water system shall comply with NSF 61-G.

36. SHOCK ABSORBERS

A. Shock absorbers shall be installed where indicated on the drawings or required by good plumbing practice and shall be Sioux Chief "Hydra-rester", properly sized and installed in accordance with the Plumbing and Drainage Institute "Standard P.D.I. WH201" and ASSE 1010.

B. Units as manufactured by Oatey, Precision Plumbing Products, J.R. Smith, Zurn, Watts or Wade will be considered as equal.

37. CAULKING AND SEALANTS

A. Provide sealing materials to seal fixtures and/or equipment to floors, walls, countertops, etc. Sealing material shall be one-part mildew-resistant silicone sealant intended for sealing interior joints with nonporous substrates and subject to in-service exposure conditions of high humidity and temperature extremes. Consult Manufacturer's technical data regarding instructions for joint preparation and joint sealer application.

B. Provide color of exposed joint sealers indicated and/or as selected by Architect from manufacturer's standard colors. Sealants shall be similar and equal to General Electric Sanitary 1700 Sealant or Dow Corning 786 Mildew Resistant Silicone Sealant.

38. PLUMBING FIXTURES

A. The plumbing fixtures as specified hereinafter are based upon the use of several manufacturers whose catalog numbers have been listed as criteria for type and description unless noted otherwise.

B. The plumbing fixtures shall be furnished with supports, control stops, trim etc., and complete in all respects. NOTE: The finish and colors for the fixtures outlined below shall be selected by the Architect.

C. Plumbing fixtures and equipment that are indicated (furnished by others) will require rough-in and final connection by the Plumbing Contractor. Those fixtures

and equipment shall be set in place under the general contract unless noted otherwise.

D. Should there be a conflict between the model numbers listed and the item description, notify the Engineer immediately, otherwise, the Contractor is responsible for furnishing fixtures and equipment that meet the description and performance characteristics as indicated herein.

E. Supplies to equipment shall be protected against back siphonage by installing vacuum breakers or backflow preventers where required.

F. Seal fixtures and/or equipment to floors, walls, countertops, etc. see item CAULKING AND SEALANTS.

G. Refer to drawings for schedule of connections.

H. Each complete fixture as specified within fixture specification is comprised of one or more individual items. Each item is specified individually and may list several manufacturers. HOWEVER, ONLY THOSE MANUFACTURERS LISTED IMMEDIATELY BELOW WILL BE APPROVED FOR USE ON THIS PROJECT. All fixtures and/or trim of any one category shall be as supplied by a single equipment manufacturer.

1. Basic Fixture: (Vitreous China, Cast Iron, Enameled Steel)
   American Standard

2. Carrier:
   Wade; Zurn; J. R. Smith; Watts; Josam

3. Seat:
   American Standard

4. Flush Valve:
   American Standard

5. Faucet:
   American Standard

6. Traps:
   McGuire; Dearborn; Brass Craft; Kohler; Zurn

7. Drains and Continuous Waste:
   American Standard; Eljer; Kohler; McGuire; Dearborn; Elkay; Just; Brass Craft; Zurn

8. Supplies:
   McGuire; Brass Craft; Zurn

I. The Architect reserves the right to disapprove any fixture deemed not equal to these specifications. The Contractor shall name the manufacturer and type he intends to use at the time of bidding, otherwise the Architect may choose any of the above specified makes.

J. A1 WATER CLOSET – FLOOR SET – ADA – MANUAL 1.28 GALLON FLUSH

1. Vitreous china, white 16-1/2" high elongated bowl, top spud, Flushometer, manual flush, right side trip - American Standard "Madera FloWise" #3461.001.020. Provide with #6063.101.002 flush valve.

2. Seat - heavy duty solid plastic, white, elongated, open front, stainless steel hinge posts, washers, and nuts – American Standard #5901.100.

K. B1 URINAL

1. Vitreous china, white elongated 14" rim, ¾" universal top spud - American Standard "Washbrook FloWise #6590.001.020. Mount at 24" and provide with manual flush valve American Standard #6045.101.002.

L. C1 – LAVATORY – COUNTERTOP – OVAL – SINGLE LEVER – ADA

1. White Vitreous China, 20" X 17" oval, self-rimming, front overflow, and faucet holes on 4" centers with extra left hand hole – American Standard "Aqualyn" #0475.035.

2. Faucet – single lever handle center set with replaceable washerless cartridge, 4" centers – American Standard "Reliant 3" #7385.053 with grid drain.

3. Supplies – angle type with loose key stop, 3" nipple, 3/8" O.D. flexible tube riser, escutcheon, and chrome finish – Brass Craft #SR1512AC; or McGuire #165LK.

4. Handicapped lavatory P-Trap, hot and cold angle stop assemblies shall be insulated with a fully molded vinyl cover. Abrasion exterior vinyl cover shall be smooth and have 1/8" minimum wall over cushion foam insert. Fasteners shall remain substantially out of sight. Zurn #Z-8946-3-NT; Plumberex "Pro-Extreme" #X4444; Dearborn #ADA100.

5. Offset drain plug – cast brass body with integral open grid strainer, offset drain assembly, 1-1/4" tailpiece and chrome finish – American Standard #7723.018; Brass Craft #0702.

M. M1 SHOWER

1. Precast 36” x 36” Floor set terrazzo shower base with minimum 1” shoulder. Provide base with 2” quick-connect drain and removable stainless-steel strainer. Fiat “Sierra” Model #36-FT, or approved equal by Acorn. Note that general contractor will provide Wetwall water-proof panels. Provide Commercial Shower System Trim Kit, 1.5 gpm with 36-inch slide bar, hand shower, shower head, and mixing valve with hot and cold check stops. American Standard #662213.002.

N. M2 ADA SHOWER

1. Precast 60” x 36” Floor set terrazzo shower base with ½” entry height stainless steel entry cap complying with barrier free requirements of ANSI Standard A-117.1. Provide base with 2” quick-connect drain and removable stainless-steel strainer. Fiat “Sequoia” Model #WTR-5007, or approved equal by Acorn. Note that general contractor will provide Wetwall water-proof panels. Provide Commercial Shower System Trim Kit, 1.5 gpm with 36-inch slide bar, hand shower, shower head, and mixing valve with hot and cold check stops. American Standard #662213.002.

* * * END OF SECTION * * *

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 15500

INDEX

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HEATING, VENTILATING AND AIR CONDITIONING

SECTION 15500

1. NOTE

   A. The requirements of Division 1 apply to all work hereunder.

2. SCOPE

   A. The work included under this section shall consist of the furnishing of all labor, materials, equipment and incidentals necessary to install the heating, ventilating, air conditioning and related work indicated on the drawings and as called out in the following technical specifications. This shall include all balancing, testing and adjustments required and/or specified.

3. DESCRIPTION OF WORK

   A. The following is a summary of the principal categories of work under this section. Note, however, that this listing is for general information only and work will not necessarily be limited to these categories. The detailed drawings and the following specifications cover the full extent of the work.

   B. The plans show the approximate location of the equipment, piping and ductwork systems, etc. involved under this section. All such work shall be performed and completed in the required manner in accordance with the contract documents.

   C. Demolition:

      1. Perform all demolition work as shown on the drawings and as specified herein or as may otherwise be required.

         a. Where items of equipment are to be removed, all incidental piping, fittings, ductwork, accessories, etc. shall be included (removed) where such items will no longer be operational.

         b. Where piping removal is indicated or required, the line shall be removed back to a main or a main branch whenever possible. At the termination point the remaining pipe shall be capped or plugged and insulated to match existing. Removal shall include associated hangers, supports, etc.

         c. Where ductwork is to be removed, all supports, hangers, etc. are to be included. The resulting ductwork openings shall be covered, sealed and insulated to match adjacent surfaces.

2. Piping and/or ductwork penetrating walls that are to be demolished shall be supported and shall have insulation patched as required. In cases where piping is running within the wall, such piping shall be removed and capped as described above.

3. If it is suspected that hazardous materials have been encountered or are present, contact the Engineer and cease work in the area(s) of concern. After consultation with the parties involved, the Owner can elect to have verification testing performed by a duly authorized and licensed organization. If it is determined that hazardous materials are actually present, the Owner will deal with the situation in an appropriate manner before work in the affected area(s) resumes.

4. Note that proper and legal disposal is considered to be part of the demolition/removal process referred to above.

D. Construction:

1. Demolition

2. Sheetmetal and air devices

3. Exhaust fans

4. Cutting and patching

5. Balancing

6. Insulation

7. Check, test, startup, and warranty

1. PERMITS, FEES, INSPECTIONS, LAWS & REGULATIONS

A. Obtain and pay for all permits required in connection with this section of the work. In addition, pay all necessary inspection fees or similar charges. Laws and regulations which bear upon or affect this work shall be complied with and are hereby made a part of this section of the work. All work which such laws require to be inspected shall be submitted to the proper public officials for inspection.

B. The requirements of the National Electrical Code (NEC) as well as all local ordinances and regulations, including those of the local utility company, shall be followed and adhered to with regard to the work under this section. Where the contract documents (plans, specifications, etc.) exceed the minimum requirements of the NEC and/or other regulations, etc., the document requirements shall govern.

C. At completion of the project furnish to the Owner, at no additional charge, a

certificate(s) of inspection issued by the authorized agency (or agencies) having jurisdiction over this portion of the project, stating that all work executed under this section complies with the minimum requirements.

D. Note that the General Building Permit will be obtained and paid for by the successful General Contractor. Contractors bidding this section of the work shall make a sufficient allowance in their bid to reimburse the General Contractor for their proportionate share of the permit cost.

E. Additional fees, charges, etc. imposed by other contractors and/or tradesmen, professional consultants, etc. for services rendered in connection with performing any portion of the work under this section shall be included as part of the work. This shall include surveys, profiles and/or other miscellaneous drawings, etc. that may be required in addition to the contract documents by any governing authority.

4. SITE INVESTIGATION

A. Prior to bidding, it is recommended that the contractor visit the job site and investigate all details which may have any effect on the installation, progress or completion of the project.

B. When a bid is received, it will be assumed that the contractor has made the job site visit(s) and is familiar with the conditions as they exist and any adjustments and/or modifications that may be necessary in order to perform and complete the work as specified.

C. At project start-up, certain areas will be designated for the storage of materials and equipment and cooperation with the Owner in minimizing interference with existing operations will be mandatory.

5. WORK DONE BY OTHERS

A. Each bidder shall become familiar with the entire project specification in order to properly delineate the areas of responsibility between trades.

B. Work to be done by others in connection with the work of this section shall include the following:

1. Painting of exposed pipes, equipment, insulated items, etc. will be done by others, except where specifically noted in the following items of this specification.

C. Domestic water will be terminated with a valve adjacent to the equipment or systems requiring same under the plumbing section. After determining that these services are suitable, adequate and located properly, make all final connections as required.

D. Current to any externally wired apparatus in this contract will be provided under the electrical section.

6. MAINTENANCE OF EXISTING FACILITIES

A. To the extent possible, maintenance of existing facilities for the present building(s) will be required. The actual length of time for any interruption shall be held to an absolute minimum. At least 72 hours in advance of the severance of any services or facilities due to modification of pipe, ductwork and/or equipment, submit the plan to the Engineer and the Owner, detailing the nature and estimated duration of the interruption and the method of procedure. Do not, under any circumstances, proceed with an interruption of service without the Owner's authorization.

B. Where alterations or additions to the existing building(s) are indicated, this work shall include all removal, rerouting, or replacement of all existing facilities located in pipe spaces or walls being removed, as may be necessary to permit operation of a complete working system or systems where applicable to the trade jurisdictions involved in this section of the specifications.

C. Where an item of equipment is to be removed, all incidental piping, tubing, ductwork, accessories, etc., associated with the equipment shall also be included where it will no longer function as part of the operating system.

1. All piping, ductwork, etc. that has been re-routed or otherwise disturbed shall be insulated as required to match existing.

D. Unless otherwise mentioned, all material, equipment, etc. removed under this contract heading shall be disposed of in a proper and legal manner.

7. BIDDING

A. All bids shall be based upon furnishing and installing the make of materials and apparatus specified herein WITHOUT SUBSTITUTION, in order that all bids may be properly compared.

B. Other materials, equipment or systems that the bidder may desire to use as a substitute for that specified will be considered IF PROPOSED AT THE TIME OF BIDDING and shown on the substitution sheet of the proposal. Such alternate items shall be of equally high quality with all safeguards, design features and operational requirements as shown on the drawings and/or as specified herein.

C. It is understood that proposals to use such substitutes shall be made in addition to and separate from the base bid in order to receive consideration and the addition to or deduction from base bid, if any, shall be duly noted on the bid form.

D. Regarding substitutes, note that any deviations from the following specifications or any special equipment requirements (ambient conditions, utilities, power conditioning, etc.) necessary for full time operation shall be clearly stated and completely itemized. Failure to meet these stipulations could result in additional expense that would be assigned to this section of the work and not considered as an extra.

E. If no proposals for substitutes are listed on the bid form, no such proposals will be permitted for later consideration unless delivery schedules or other factors beyond the Contractor's control justify same.

F. If more than one make of material or equipment is specified, the proposed manufacturer, brand, type, etc. shall be identified. If this provision is not complied with, the Owner may then make this selection without change in contract price.

G. Note that in the following specifications, where more than one manufacturer is listed for a particular item of operating equipment, the design will be based on the first named. If equipment by the other named manufacturer(s) or a proposed substitute requires redesign work, revised/modified services, or specific additional field work by other trade(s), the price submitted for providing this equipment must include the required additional amount to cover such work.

8. DRAWINGS

A. The drawings prepared for this project are an outline to show where pipes, ducts, apparatus, equipment, etc., should generally be located in order to fit within the confines of available space and minimize conflicts with existing obstacles as well as other trades. All work must be installed in accordance with the drawings insofar as possible. All drawings shall be carefully checked during the course of bidding and construction. If any discrepancies, errors or omissions or overlaps with other trades are discovered prior to or during the construction phase, notify the Engineer immediately for interpretation or correction. Note that an overlap with another trade does not relieve the contractor from the obligation of performing the work indicated on the drawings for this section of the project unless written notification stating such is obtained from the Engineer.

B. Take all necessary measurements and be responsible for same, including clearances for all materials and equipment that will be furnished. The Architect/Engineer shall reserve the right to make minor location changes of piping and/or equipment where such adjustments are deemed desirable from an appearance or operational standpoint. Such changes will normally be anticipated sufficiently in advance to avoid extra work or unduly delay progress on the project.

C. The general building drawings shall be used to obtain dimensions and exact locations and as a check with other disciplines to avoid interferences. Prior to making any layout drawings check existing conditions and refer to applicable drawings on all branches of the work where other trades are involved on the project.

Also, consult with the other trades in producing necessary coordination/erection drawings so that added field work and/or job delays resulting from conflicts between crafts can be avoided. Piping that has been prefabricated before coordinating with the other trades will have to be re-done at no additional cost to the Owner if conflicts are encountered.

D. Note that the piping and/or ductwork shown on the drawings shall be considered as diagrammatic for clearness in indicating the general run, connections required, etc. and may not in all cases be shown in its true position. Ductwork, piping and/or equipment may have to be offset, lowered or raised as required or as directed at the site in order to properly accommodate field conditions.

9. SPECIFICATIONS

A. Specifications shall be interpreted in conjunction with the drawings hereinbefore described and if anything is shown on the drawings and not mentioned in the specifications or vice versa, it is to be included in the work the same as though clearly set forth by both.

B. Furthermore, all materials or labor obviously required to fully complete the work shall be included in the bid, even though each item necessarily involved is not specifically mentioned or shown. Such work and/or material shall be furnished and shall be of the same grade or quality as the parts actually specified and shown. Should there be a conflict between the plans and specifications, the greater quantity or better quality shall be furnished.

C. Should an overlap of work between the various trades become evident, the Engineer shall be notified. Such an event shall not relieve any trade of the responsibility for the work called for under his branch of the specifications until a written clarification or directive is issued concerning the matter.

D. When selecting equipment to be used on this project, refer to Item CLEARANCES AND INSTALLATION REQUIREMENTS in these specifications.

E. Note that all systems and items of equipment involved under this contract heading shall be furnished and installed in accordance with applicable requirements of federal, state and local codes including the ADA (Americans with Disabilities Act) and specifically referenced portions of NFPA Standard 90A and ASHRAE 90.1. This shall include adhering to the requirements governing mounting heights for occupant operable controls, where applicable.

F. All references made to codes, standards, etc. in these specifications or on the drawings shall be taken to mean the latest edition, amendment and/or revision of such reference in effect as of the date indicated on the Bid Documents.

10. SHOP DRAWINGS

A. Prepare or obtain from the manufacturer, certified shop or erection drawings of all items of equipment to be furnished under this section and submit copies of same as required for review. This shall be done as soon as possible, well prior to proceeding with installation or construction and in the proper sequence to avoid delays in the work, the work of the Owner or other contractors. Unless otherwise indicated, a minimum of six (6) hard copy sets OR one (1) electronic set shall be submitted. These drawings shall be complete in every respect, showing pertinent details of size, capacities, arrangement, fittings, piping, kinds and thickness of materials, weight, loading required, clearances for service, maintenance, etc. Departures or deviations, if any, from the specifications, listed performance data, etc., shall be called out on the submittals. Note that in the following items of this specification, where more than one equipment manufacturer is listed, the first named has been used as the basis for design. All departures or deviations in material, performance, service requirements, size, construction, etc. from first named by the make submitted shall be noted on the shop drawings. **NOTE:** Where departures or deviations from the specifications do occur, the contractor shall additionally itemize same on the cover sheet that accompanies the submittals. Failure to do so will risk subsequent rejection at the job site. (With regard to voluntary substitutions, refer also to Item BIDDING in this specification.)

1. By submitting such drawings, the Contractor represents that he has selected and verified conformance of the proposed materials and equipment to the specifications, has verified the adequacy of the space available and/or taken necessary field measurements, and has noted field construction criteria, etc. related thereto, or will do so. In addition, it will be assumed that the Contractor has checked and coordinated the information contained within such submittals with the requirements of the Work and the Contract Documents as noted in the previous paragraph.

B. Materials and equipment to be furnished for this project shall be of current production by manufacturers regularly engaged in the manufacture of such items. When two or more similar items are required, they shall be the product of one manufacturer.

C. The review of shop drawings shall not be construed as a complete check but will indicate only that the capacity, general method of construction and/or detailing is satisfactory. It does not involve determining the accuracy or completeness of such particulars as dimensions or quantities or indicating full and complete compliance with the specifications. In addition, it does not deal with the means, methods or procedures of construction or installation. The Contractor shall carefully check and verify dimensions for installation and service requirements before ordering equipment for the project.

D. The Contractor is advised to request submittals from all other trades before proceeding with any system connections, etc. on equipment furnished by them.

E. Submittals shall be itemized on a standardized shop drawing submittal form stating the name of the project, specification section, paragraph and/or drawing numbers applicable to submittal and shall bear the contractor's review stamp as evidence that the items have already been checked for compliance with Contract Documents as stated above.

F. After review, shop drawings will be returned five (5) hard copy sets OR one (1) electronic set, marked in one of the following ways:

1. "NO EXCEPTIONS NOTED" - Copies may be distributed as required for construction, shipment, etc. to proceed.

2. "EXCEPTIONS NOTED" - Contractor may proceed with and/or authorize construction, shipment, etc. taking into account the necessary corrections.

3. "EXCEPTIONS NOTED - REVISE AND RESUBMIT" - Contractor will be required to resubmit shop drawings in their entirety. No fabrication, erection or installation shall be authorized or initiated until shop drawings so marked have been completely revised, resubmitted and subsequently marked in accordance with either of the two preceding subparagraphs. Only shop drawings officially marked "NO EXCEPTIONS NOTED" or "EXCEPTIONS NOTED" will be permitted on the jobsite.

G. Upon return of submittals take appropriate action as specified above. Note that any shop drawing hard copies received beyond the number required will be destroyed (not returned).

H. Where resubmittal is required, four (4) hard copies OR one (1) electronic copy will be so noted by the reviewer, of which two (2) hard copies OR one (1) electronic copy will be returned for corrections (one (l) hard copy for the contractor and one (l) hard copy for the supplier/subcontractor).

11. MATERIALS AND WORKMANSHIP

A. Materials used in this contract shall, in all cases, be those specified herein unless proposals for the use of alternate materials have been submitted and accepted in writing, as provided hereinbefore. All materials shall be strictly first grade of their kind and shall be new and in first class condition when installed. All materials damaged in transit or otherwise will be rejected and must be replaced by proper and acceptable materials.

B. Workmanship throughout shall conform to the standards of best practice, and all labor employed must be competent to do the work required. Tool marks will not be permitted on any exposed materials, fixture or fitting. Work that is determined to be below normal industry standards of best practice shall be redone and/or replaced at the contractor’s expense. Note: Refer to specification item WARRANTIES.

C. Exact locations of electric outlets, piped equipment, piping, lighting fixtures, ducts, etc., shall be coordinated as described in Item DRAWINGS, so there will be no interference at installation.

D. Rigid metal ducts shall be installed with support systems as indicated in the Tables & Figures of the SMACNA HVAC Duct Construction Standards. They shall be installed as required to maintain alignment. Upper attachment to structures shall have an allowable load not more than one-fourth of the failure load of the method utilized. Hangers shall be strips of galvanized steel or round, uncoated, hot-rolled steel rod.

12. CLEARANCES, INSTALLATION REQUIREMENTS, ETC.

A. The contractor shall be responsible for verifying compliance with the specifications for all materials and equipment provided under this section of the work. In addition, all materials and equipment shall be installed in strict accordance with applicable code requirements as well as the manufacturer's recommendations, instructions, installation/shop drawings, etc. The recommended clearances for service, maintenance, etc., as well as for proper operation, shall be observed and provided in all cases.

13. PROTECTION

A. Provide proper protection to the building, equipment, etc., during the execution of all work involved under this contract heading.

B. This protection shall include the covering all apparatus, building surfaces and/or other materials to protect same from dirt; providing adequate temporary connections to protect apparatus from damage of any sort; and providing the required shielding to protect finished parts of the building.

C. During installation and until final connections are made, all piping and ductwork shall be protected against entry of foreign matter. Equipment connections shall be carefully sealed until the actual time of system tie-in.

14. TESTING

A. A complete test or tests of all work under this contract shall be conducted as soon after completion as practicable. Prior notification of all tests shall be made to the Engineer.

B. Apparatus furnished under this contract heading which fails to deliver its full rated capacity, or which is defective or unacceptable in other ways, shall be replaced or adjusted as required to comply with the intent of the specifications.

C. Calibrated instruments, meters, equipment, facilities, and labor required to properly conduct tests shall be provided as required. If system testing results or equipment

performance does not meet specifications or capacity requirements, the necessary corrective measures shall be taken, and the testing shall be repeated until requirements are met.

15. BALANCING

A. The following described balance work shall be performed by a member of the Associated Air Balance Council or the National Environmental Balance Bureau.

B. Balancing the air systems shall be accomplished by determining the quantity of air flowing through each diffuser/register neck by means of velometer and pitot tube or other suitable means. Air discharge or exhaust at each device shall be as noted on the drawing or the schedule. Where possible, preliminary balancing shall be made at the branch ducts through a splitter, an air volume extractor, or at the branch take-off fitting damper. Final adjustment shall be made at the individual terminals. A performance log for all registers, grilles and diffusers shall be included in the balance report provided at the completion of this portion of the work.

C. Where an air device fails to perform at its rated or specified capacity, a traverse shall be made in the ductwork at field-selected points until the location of excessive pressure drop can be determined. The condition shall then be remedied so that specified performance can be achieved. All holes in ductwork shall be carefully plugged.

D. All balance data and equipment performance data shall be listed by category for this submittal. Each category of balance data shall be assembled in tabular form.

E. Three complete reports containing all the required information shall be submitted for review prior to or at the completion of the project. Such reports shall be typewritten, with cover sheet listing the job name, date, contractor, etc. and shall be looseleaf bound.

F. All instrumentation, meters and miscellaneous equipment required in performing the balancing operations specified above shall be furnished as part of this item.

16. CLEANUP

A. All rubbish resulting from the work herein specified shall be removed from the premises at the end of each working day.

B. Upon completion of the work, remove from the project site all tools, equipment, surplus materials and all remaining rubbish pertaining to the work under this contract heading. Responsibility for this shall include all related costs for such removal and disposition including hauling, dumping, etc.

C. By this time all extraneous labels, tags, etc., as well as other markings on equipment and ductwork not field insulated shall be removed.

17. WARRANTIES

A. Provide warranties to the Owner that all materials and equipment furnished are new, unless otherwise specified, and that all work is of good quality, free from faults and defects and in conformance with the Contract Documents.

B. Warranties on all work and equipment shall commence on the date of substantial completion of the work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. These warranties shall be in writing and, along with all related documents, shall be submitted prior to the issuance of any certificates of acceptance. Warranties shall include equipment manufacturers' three (3) year non-prorated warranty certificates or other extended warranties as well as the contractor's three year warranty statement for the project. This documentation shall be submitted in an appropriately marked, 3-ring hard cover binder.

C. If, within one year after the date of substantial completion of the work or within three years after acceptance by the Owner or within such longer period of time as may be prescribed by the terms of any applicable special warranty specified for a particular equipment item, any work is found to be defective, malfunctioning or not in accordance with the Contract Documents, it shall be promptly corrected upon receipt of official notification to do so. This obligation shall survive termination of the contract. Note that the term "work" shall be taken to include all equipment provided under the contract as well as materials and workmanship.

18. CUTTING AND PATCHING

A. All cutting and/or drilling of walls, slabs, structural members, etc., required in conjunction with work under this section shall be performed as part of the work and shall be done under the supervision of the General Contractor. Work shall be neatly done, without unnecessary removal of material. Holes, openings, etc. shall be located where they will not weaken the structure. No beams, joists, etc., shall be cut without written authorization from the Architect.

B. Openings made in walls, partitions, etc., shall be carefully cut/drilled and accurately sized for the penetrating item.

C. Patching and/or repairing of all work, including finished surfaces, necessitated by the demolition or installation of work under this section shall be considered as part of this work. It shall, however, be performed by mechanics of the appropriate trade in order to achieve a workmanlike job. This shall include, but not be limited to, all items of concrete and masonry work, millwork, gypsum board and/or plaster work, painting, floor finishes and ceiling finishes as well as all other surface finishes.

D. When the need for such patching or repairs arises, immediate arrangements shall be made with the appropriate trade(s) or with the General Contractor to perform the necessary work at no additional cost to the Owner. The final responsibility for

acceptance of such work by the Owner's representative shall reside with the contractor for this section of the project.

19. INSERTS AND SLEEVES

A. Inserts (concrete expansion anchors) shall conform to applicable requirements of Federal Specification FF-S-325. Embedment, anchor length and size shall be in accordance with manufacturer's recommendations. Anchors 3/8" through 3/4" shall be U.L. listed for pipe hangers.

B. Sleeves shall be provided for duct openings cut in masonry walls as well as for similar openings in non-masonry walls, partitions, etc. Sleeves shall be of galvanized sheet metal with flanged ends and shall be securely mounted in place. Voids between masonry and sleeve shall be filled with mortar. In rated walls, openings between pipes and/or ducts and structure, wall or sleeve shall be filled with firestop sealant to produce a fire, smoke, and water barrier as described below.

C. Floor, roof and rated wall penetrations are to be sealed with an approved fire, smoke and water barrier sealant. Material shall be noncombustible as defined by ASTM E-136 and shall maintain its integrity and dimensional stability while preventing the passage of flame, smoke, etc. under conditions of installation and use when exposed to the ASTM E-119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Sealant material shall be by Specified Technologies, Inc. It shall be tested to ASTM E-814, UL 2079 or UL 1479 for specific fire rated construction conditions. Install in accordance with manufacturer's recommendations.

20. SUPPORTS, HANGERS AND BRACKETS

A. All hangers, brackets, etc. for supporting material and equipment included under this section of the work shall be furnished and properly installed as required and as specified in the following.

B. Piping and duct work systems shall be supported independently from each other. In addition, the utilities and mechanical services shall be separate installations from the ceiling grid system and shall be independently supported from the building structure. Where interferences occur, trapeze hangers or supports shall be employed. Care shall be taken to avoid blocking access to terminal air boxes, fire dampers, valves, etc.

21. HOISTS, RIGGINGS, TRANSPORTATION AND SCAFFOLDING

A. Provide all necessary scaffolding and rigging to locate the material, equipment, etc. of this section in its proper place on the project. All such temporary work shall be removed from the premises when no longer required.

B. Scaffolding, etc., shall fully comply with requirements of all pertinent Federal, State and Local Laws and Codes.

22. DUCTWORK

A. General:

1. Furnish and install all ductwork and related sheet metal work indicated and/or specified or required for the mechanical system(s) shown on the plans.

2. Galvanized sheet steel utilized for duct construction and other sheet metal fabrication work under this section shall conform to ASTM A-653 and A-924.

3. All ductwork, miscellaneous sheet metal work, etc., shall be fabricated and erected in a first class and workmanlike manner in accordance with applicable provisions of local and/or state building codes in accordance with standard practice of the Sheet Metal and Air Conditioning Contractor's National Association as described in applicable SMACNA manuals of construction standards and in accordance with the International Mechanical Code. Ducts shall be supported from and/or anchored to the building structure as indicated in the manual and shall be so installed as to be completely free from vibration with system mechanical equipment in operation.

4. Ductwork shown on drawings shall be considered as diagrammatic for clearness in indicating the general run, size, connections required, etc. and may not be shown in its exact position. Ductwork may have to be offset, lowered or raised as required or as directed at the site. The possibility of a requirement for this shall be taken into account when preparing the bid for the work and such adjustments shall be accomplished at no additional cost. Duct sizes indicated are inside dimensions. Where a duct size must be altered to avoid interferences or because of clearance restrictions, the revised size shall provide approximately the same air handling characteristics.

5. Factory fabricated materials used for installation of air duct systems shall meet the listing requirements of UL Standard 181 where applicable.

6. All ductwork penetrating floors, fire rated walls and/or smoke partitions or connected to room air devices installed in fire rated ceilings, shall be of not less than No. 22 MSG galvanized steel construction. Perimeter clearances at penetrations shall be sealed with an approved fire stop in accordance with the requirements of NFPA 90A and as required by State and/or local codes.

7. The installation of fire dampers and the installation of ductwork connecting to fire dampers shall be in accordance with applicable installation instructions of the damper manufacturer as well as SMCNA and NFPA standards. In addition, the ductwork installation shall meet the requirements of local code documents.

8. Where balancing dampers are to be installed in branch ducts, etc. (see Item GRILLES, DIFFUSERS, ETC.) they shall be placed near the branch take-off in order to minimize any noise carry-over to the conditioned space.

9. Flexible ducts shall be run with as few bends, turns, etc. as possible and connections that are run to terminal air boxes shall have at least three (3) diameters of straight duct ahead of the tie-in. All installations shall be provided with sufficient supports to limit flexible duct sag to 2-1/2 inches maximum. Support bands shall be minimum 1-1/2" inch wide, and the final support shall be within 18 inches of the terminal air box/air device. Attachment at both ends shall be made with approved plastic or steel draw-bands, screws and duct tape. Note that installations having abrupt turns or sharp bends are not acceptable.

10. Air devices shall be installed in accordance with manufacturer's published instructions. For all ceiling mounted air devices on the project, coordinate the actual model selected with the specific type of ceiling involved in order to insure complete compatibility at installation. Note that louvers to be furnished and/or set in exterior walls under this section of the work shall be carefully caulked at the perimeter when installing in order to achieve a totally watertight installation.

B. Low Pressure:

1. Unless otherwise specified, ductwork shall be constructed from mild steel galvanized sheets of lock forming quality and shall conform to the recommended gauges and construction methods listed in the SMACNA Duct Construction Standards manual for specified pressure requirements. Galvanized coating thickness shall be of commercial designation G 90 (ASTM A 653/A 653M) LFQ chem treat. Ductwork exposed to view shall have a milli-phosphatized finish.

2. Ducts shall be properly braced and reinforced, and each panel of rectangular ductwork shall be girth beaded or cross-broken where stipulated in the manual. Upper attachment of hanger rods and straps shall be selected for a safety factor of not less than four, based on ultimate loads. For rectangular ducts over 54" in width, hangers shall be angle trapeze type with rod or supports.

3. All ductwork, including plenums, shall have joints and seams sealed in accordance with the requirements listed under paragraph 6.2.4.2 of

ASHRAE Standard 90.1. Sealants shall be formulated for ductwork installations and shall be UL listed. The recommended temperature range shall be suitable for the application.

4. On rectangular ductwork, all sub-branch connections to main branch ducts shall be made with branch duct tap-in fittings with 45° entry throat, gasket and volume damper or with straight tap connections utilizing rectangular bellmouth fittings with gasket and volume damper.

5. Provide quadrant locking type splitter dampers where shown or where required to properly balance system air in main branch ducts...See applicable portions of appropriate SMACNA manual.

6. Provide air turning vanes in each duct elbow or similar fitting. Turning vanes shall be fabricated and installed as indicated in the manual with double vanes used for longer unsupported lengths.

7. Provide vanes in short radius elbows and where shown on the plans to properly distribute air across entire face of duct. Vanes shall be fabricated and installed in accordance with requirements as shown in the manual.

8. For distribution systems where the diffuser or register is within 24 inches of the trunk duct, provide the supply runout with an equalizing grid in addition to the balancing damper.

9. Discharge plenums with duct collars for terminal air boxes may either be furnished by the box manufacturer or fabricated by the sheet metal contractor.

C. Miscellaneous Duct Joints:

1. All concealed exhaust duct joints shall be sealed with UL listed metal faced duct tape. The tape shall have a published tensile strength of at least 35 lbs/inch width and shall conform to applicable SMACNA standards.

D. Flexible Duct Connectors:

1. Flexible air connectors shall be the pre-insulated type consisting of a corrosion-resistant steel helix permanently bonded to a liner consisting of multiple layers of reinforced aluminum foil/polyester laminate. The assembly shall be covered with a 1-1/2" glass fiber blanket encased in a fire retardant, aluminum metalized, reinforced vapor barrier jacket. Duct connectors shall comply with applicable requirements of NFPA Standard 90A, BOCA and SBBC, and shall be listed as Class 1 Connector, UL Standard 181. Rated temperature range shall be 0° to 250° F, UL rated velocity shall be at least 4,000 fpm and UL rated internal working pressure

listings shall be at least positive 6" w.g. and negative 4" w.g. thru 16" diameter.

a. Connectors shall be installed in accordance with manufacturers' recommendations and limited to a maximum length of 8 feet. Unless dimensioned otherwise, select connectors to match neck size of diffusers or to have an air velocity not over 800 feet per minute.

2. Flexible connectors indicated for return or exhaust air service shall meet the above criteria except that they need not be insulated unless specifically called for.

E. Miscellaneous:

1. The selection of ceiling mounted air devices shall be appropriate for the type of ceiling involved. Where surface mounted installation is required, the devices shall be designed for surface mounting or shall be installed with the proper trim-strip assembly required to achieve a finished appearance.

23. INSULATION

A. Provide the required insulation for all ductwork, etc., as described and listed in the following:

B. General Requirements:

1. All insulating materials, linings, tapes, coverings, etc., to be used on this project shall have composite fire and smoke hazard ratings, as tested by procedure ASTM E84, NFPA 255, NFPA 258 and UL 723, not exceeding flame spread 25 and smoke developed 50 unless otherwise noted. Specific items of equipment that are factory insulated are not governed by this item of the specifications.

2. Insulation Index - Ductwork, Equipment and Piping shall be covered with the classification and thickness of insulation noted in the Insulation Index listed in this item of the specifications. Note that insulation thickness on modified ductwork need only match that on adjacent ductwork of that system unless otherwise noted.

3. Surface Finish - All field applied surface finish reinforcing mesh, as listed in the index, shall be equal to #10 glass fiber open weave reinforcing mesh (referred to as glass cloth). When tested according to ASTM method D-579, the mesh material shall indicate a tensile strength warp of 75 lbs/sq.in. and fill of 75 lbs/sq. in

C. General Instructions:

1. Before field insulation is applied, all items to be covered shall have been tested in accordance with requirements of the specifications - See Item TESTING. Tests shall be verified by the Engineer before proceeding with the work.

2. Prior to the application of insulation or insulation adhesives, the surfaces to be covered shall be thoroughly cleaned of all dust, dirt, grease and moisture. Also, determine whether any piping systems are to be painted prior to receiving insulation.

3. Where insulation is butted, all laps and joints shall be sealed with adhesive. The use of staples is acceptable only as an installation aid and not as a substitute for adhesive. Where staples are used on pipe covering in exposed locations, care must be taken to locate the staple joints in such a way that they are not in direct view.

D. Adhesives, Coating, Vapor Barrier Materials:

1. All factory attached vapor barrier materials, and all adhesives, mastics, coatings and insulation materials applied as herein specified shall be acceptable under NFPA standards 90A and/or shall have a dry flame spread index not to exceed 25 when tested in accordance with applicable Federal Standards. In addition, materials shall be in accordance with applicable portions of MIL-A-3316C, Classes 1 and 2, Grade A.

2. The toxicity of the solvents used on the premises must be such that the maximum allowable concentration (MAC) in parts per million (PPM) is 200 or higher according to the latest value published by the American Conference of Governmental Industrial Hygienists.

E. Materials:

1. Class "B" Insulation

a. Mineral fiber blanket - type insulation faced with a reinforced aluminum foil laminated to UL rated kraft similar to a Class "B" facing as manufactured by CertainTeed, Knauf, Johns Manville, Manson, Owens Corning or Schuller. The "k" factor for this insulation shall be 0.29 or less at 75F mean and the installed R value shall be 6.0 or greater for 2-1/2" duct wrap. Product shall meet performance specifications as published by GSA and HUD/FHA. Published temperature range shall extend from 40F to 250F or greater, faced. Duct wrap shall be in compliance with ASTM C553, Type II, Class F-1.

b. Insulation shall be adhered to duct surface using 6" wide strips (on 12" centers) of UL listed fire retardant duct adhesive. Butt edges and

secure with 2" wide strips of jacket overlap and seal. When cooling is involved, use a pressure sensitive tape in addition in order to assure a vaporproof joint.

c. Insulation over duct stiffeners and standing seams shall be built up using a 4" wide strip of insulating material adhered to adjacent duct insulation and sealed with tape.

24. GRILLES, DIFFUSERS, DAMPERS, ETC.

A. For a complete listing of all grilles, registers, diffusers, etc., refer to the Air Device Schedule on the drawings. Note that any NC level ratings indicated on the schedule are based on ANSI/ASHRAE Standard 70-1991 and manufacturer's equipment must be tested and rated in accordance with this standard.

B. Grilles, diffusers, registers, etc. as manufactured by Price, whose catalog numbers appear on the drawings, have been used for criteria of type and duty. Equivalent devices furnished by Metal-Aire or Titus will be considered equal. Devices that are of extruded aluminum shall have an etched satin anodized finish.

1. Equip all ceiling diffusers and other supply air devices with equalizing grids and opposed-acting volume dampers. Equalizing grids shall have individually adjustable airfoil louvers, spring tensioned. Vanes shall be of extruded aluminum and the frame shall be of enameled steel or aluminum.

2. Ceiling mounted air devices shall be designed for compatibility with the specific type of ceiling system in which they are to be installed. Slot diffusers used with lay-in ceilings shall be furnished with T-bars and shall have cross notches as required. Where fixed/inaccessible ceilings are involved, air devices shall be designed for surface mounting.

ELECTRICAL

SECTION 16000

INDEX

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1. NOTE

   A. The General Conditions and the Special Conditions of the Contract apply to this Section. This Contractor shall be responsible for complete familiarity with same. Work shall include but not be limited to the following principle items.

2. SCOPE

   A. The work included under this section shall consist of the furnishing of all material, equipment and labor required to install all of the electrical work indicated on the drawings and as specified hereinafter, including the testing and adjustment of same.

3. DESCRIPTION OF WORK

   A. The following is a summary of the principal categories of work under this section. Note, however, that this listing is for general information only and work will not necessarily be limited to these categories. The detailed drawings and the following specifications cover the full extent of the work.

   B. Secondary Services:

      1. Additions and/or revisions to the existing electrical distribution system as indicated on the drawings.

      2. Temporary service for construction.

   C. Emergency Power:

   D. Exit Lighting:

      1. Additions and/or revisions to the existing electrical distribution system as indicated on the drawings.

      2. Exit lighting including conduit, wire, boxes, and fixtures.

   E. Lighting:

      1. Lighting fixtures including installation, complete with lamps, hangers, and accessories.

   F. Outside Lighting:

      1. An addition (and revision) to the outside lighting fixture installation complete with lamps, wire, conduit, brackets, poles (concrete bases)

and accessories.

G. Devices:

1. Power outlets and control devices including wall switches and receptacles as defined on the legend.

H. Fire Alarm & Security:

1. An addition and revision to the existing fire alarm system including bells, sending stations, smoke detectors, air handling unit duct detectors, annunciator, control unit modules and an independent conduit and wire network.

2. An intrusion alarm system will be provided and shall be connected to base security office.

I. Telephone Systems:

1. A system of empty conduit stubs, miscellaneous outlets, plates, backboards, etc., for a complete new owner installed telephone system.

J. Demolition:

1. Removal of existing electrical devices that are noted on drawings and those devices in the area of the work that are obviously necessary to be removed or relocated.

K. Mechanical Equipment:

1. Motor and power connections to items of mechanical and shop equipment including applicable controls.

4. PERMITS, FEES, INSPECTIONS, LAWS & REGULATIONS

A. Obtain and pay for all permits required in connection with this section of the work. In addition, pay all necessary inspection fees or similar charges. Laws and regulations which bear upon or affect this work shall be complied with and are hereby made a part of this section of the work. All work which such laws require to be inspected shall be submitted to the proper public officials for inspection.

B. The requirements of the National Electrical Code (NEC) as well as all local ordinances and regulations, including those of the local utility company, shall be followed and adhered to with regard to the work under this section.

Where the contract documents (plans, specifications, etc.) exceed the minimum requirements of the NEC and/or other regulations, etc., the document requirements shall govern.

C. At completion of the project furnish to the Owner, at no additional charge, a certificate(s) of inspection issued by the authorized agency (or agencies) having jurisdiction over this portion of the project, stating that all work executed under this section complies with the minimum requirements.

D. Note that the General Building Permit will be obtained and paid for by the successful General Contract Bidder. Contractors bidding this section of the work shall make a sufficient allowance in their bid to reimburse the General Contractor for their proportionate share of the permit cost.

E. Additional fees, charges, etc. imposed by other contractors and/or tradesmen, professional consultants, etc. for services rendered in connection with performing any portion of the work under this section shall be included as part of the work. This shall include surveys, profiles and/or other miscellaneous drawings, etc. that may be required in addition to the contract documents by any governing authority.

5. SITE INVESTIGATION

A. Prior to bidding, it is recommended that the contractor visit the job site and investigate all details which may have any effect on the installation, progress or completion of the project.

B. When a bid is received, it will be assumed that the contractor has made the job site visit(s) and is familiar with the conditions as they exist and any adjustments and/or modifications that may be necessary in order to perform and complete the work as specified.

C. At project start-up, certain areas will be designated for the storage of materials and equipment and cooperation with the Owner in minimizing interference with existing operations will be mandatory.

6. DRAWINGS

A. The drawings prepared for this project are an outline to show where conduit, devices and distribution equipment must go in order to harmonize with the building and installations of the various trades. All work must be installed in accordance with the drawings insofar as possible. All drawings shall be carefully checked during the course of bidding and construction. If any discrepancies, errors or omissions or overlaps with other trades are discovered prior to or during the construction phase, notify the Engineer

immediately for interpretation or correction. Note that an overlap with another trade does not relieve the contractor from the obligation of performing the work indicated on the drawings for this section of the project unless written notification stating such is obtained from the Engineer.

B. Take all necessary measurements and be responsible for same, including clearances for all equipment that is to be furnished. The Architect/Engineer shall reserve the right to make minor location changes of equipment where such adjustments are deemed desirable from an appearance, installation or operational standpoint. Such changes will normally be initiated sufficiently in advance to avoid extra work or unduly delay progress on the project.

C. In general, the conduit and wiring layouts shall be considered as diagrammatic for clearness and legibility and are to be used as a guide. Therefore, it is not intended that the drawings indicate all necessary offsets, junction boxes, pull boxes, etc. Conduit, wiring, fixtures, equipment, etc. may have to be offset, lowered or raised as required or as directed at the site in order to accommodate field conditions. In addition, relocate or shift equipment, fixtures and devices without cost, when so directed by the Engineer, providing such items have not been installed and the revised location is not greater than 10 feet from the location indicated.

D. Note also that electrical connections indicated on the drawings may not be shown in the correct location for the equipment, fixtures, devices, etc., actually selected for the project. Verify all connection locations with shop drawings of the item to be installed or make field measurements before proceeding with any rough-in work.

E. The general building and/or structural drawings shall be used to obtain dimensions and exact locations and as a check with other contractors to avoid interference with their work. Refer to applicable drawings on all branches of the work where other trades are involved on the project so that added field work and/or job delays resulting from conflicts between crafts can be avoided.

7. SPECIFICATIONS

A. Specifications shall be interpreted in conjunction with the drawings hereinbefore described and if anything is shown on the drawings and not mentioned in the specifications or vice versa, it is to be included in the work the same as though clearly set forth by both.

B. Furthermore, all materials or labor obviously required to fully complete the work shall be included in the bid, even though each item necessarily

involved is not specifically mentioned or shown. Such work and/or material shall be furnished and shall be of the same grade or quality as the parts actually specified and shown. Should there be a conflict between the plans and specifications, the greater quantity or better quality shall be furnished.

C. Should an overlap of work between the various trades become evident, the Engineer shall be notified. Such an event shall not relieve any trade of the responsibility for the work called for under his branch of the specifications until a written clarification or directive is issued concerning the matter.

D. When selecting equipment to be used on this project, refer to Item EQUIPMENT CLEARANCES AND REQUIREMENTS in these specifications.

E. Note that all systems and items of equipment involved under this contract heading shall be furnished and installed in accordance with applicable requirements of federal, state and local codes including the ADA (Americans with Disabilities Act), OSHA requirements and applicable portions of NFPA. The above includes adhering to applicable requirements governing mounting heights for occupant operable controls.

F. All references made to codes, standards, etc. in these specifications or on the drawings shall be taken to mean the latest edition, amendment and/or revision of such reference in effect as of the date indicated on the Bid Documents.

G. All hardware, software and firmware purchased and/or installed under this contract, individually and in combination with each other, shall function free of any fault in processing dates and any information relating to dates, including calculating, comparing, and sequencing information and/or functions which depend on dates through and beyond January 1, 2000. Such fault-free operation shall not require any modification after the system is installed and it shall be transparent to the user.

8. MATERIALS AND WORKMANSHIP

A. Materials supplied under this contract shall be new and in strict accordance with the provisions of these plans and specifications. Any material required which is not specifically represented by a manufacturer's catalog number of quality standard, shall be subject to the approval of the Architect/Engineer in all cases. When two or more items of the same equipment are involved, they shall be identical in quality and made by the same manufacturer.

B. Materials shall be the latest design of that manufacturer and shall be shipped to the job in the original container with proper identification as to size, type and dates of inspection and shipment.

C. Electrical work shall be performed by mechanics skilled in their respective trades. Tool marks will not be permitted on any exposed materials, fixture or fitting. In addition, all exposed materials, fixtures, equipment, etc. shall be installed in straight horizontal and/or vertical lines, parallel to the building lines wherever possible. Carelessly executed work as well as workmanship that is determined to be below normal industry standards of best practice, and/or work not conforming to the requirements of this item, shall be redone or repaired as required prior to final acceptance.

9. CUTTING AND PATCHING

A. All cutting and/or drilling of walls, slabs, structural members, etc., required in conjunction with work under this section shall be performed as part of the work and shall be done under the supervision of the General Contractor. Work shall be neatly done, without unnecessary removal of material. Holes, openings, etc. shall be located where they will not weaken the structure. No beams, joists, etc., shall be cut without written authorization from the Architect.

B. Cutting of holes in masonry and/or concrete shall be performed with a core drill to minimize spalling, etc. Locations shall be accurately determined and checked and the appropriate drill bit shall be used to minimize hole size.

C. Sleeves or thimbles for these holes as well as escutcheons and trim plates shall be provided as described in Item INSERTS, PENETRATIONS AND SLEEVES.

D. NOTE: Cutting of water lines, electric conduit or similar service lines in the course of work performed under this section shall be immediately repaired as part of the work of this section.

E. Patching and/or repairing of all work, including finished surfaces, necessitated by the demolition or installation of work under this section shall be considered as part of this work. It shall, however, be performed by mechanics of the appropriate trade in order to achieve a workmanlike job. This shall include, but not be limited to, all items of concrete and masonry work, millwork, gypsum board and/or plaster work, painting, floor finishes and ceiling finishes as well as all other surface finishes.

F. When the need for such patching or repairs arises, immediate arrangements shall be made with the appropriate trade(s) or with the General Contractor

to perform the necessary work at no additional cost to the Owner. The final responsibility for acceptance of such work by the Owner's representative shall reside with the contractor for this section of the project.

10. PROTECTION

A. Provide proper protection to the building during the execution of all work involved under this contract heading.

B. This protection shall include covering all apparatus, building surfaces and/or other materials to protect same from dirt; adequate temporary connections to protect apparatus from damage of any sort; and required shielding to protect finished parts of the building. The following shall apply where applicable:

C. Protect finished floors from chips and cutting oil by the use of a metal chip receiving pan and an oil proof floor cover.

D. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.

E. Protect all electrical equipment finished surfaces from paint droppings, insulation adhesive and sizing droppings, etc., by the use of drop cloths.

F. Exercise extreme caution in the handling and storage of tools, material and equipment in order to prevent damage to other contractor's work and/or materials and to avoid repair costs.

G. All switchgear, transformers, fixtures and other electrical equipment stored at the site with exposed openings, bearings, etc. shall be covered to exclude dust and moisture. All stockpiled conduit shall be placed on dunnage and protected from weather and from entry of foreign material.

H. Furnish necessary devices, strip heaters, wiring, connections, power, etc. to provide temporary heat to keep moisture out of apparatus and equipment such as transformers, motors, etc. furnished under this section.

11. PREPARATION OF BIDS

A. All bids shall be based upon furnishing and installing the make of materials and apparatus specified herein WITHOUT SUBSTITUTION, in order that all bids may be properly compared.

B. Other materials, equipment or systems that the bidder may desire to use as a substitute for that specified will be considered IF PROPOSED AT THE TIME OF BIDDING and shown on the substitution sheet of the proposal.

Such alternate items shall be of equally high quality with all safeguards, design features and operational requirements as shown on the drawings and/or as specified herein.

C. It is understood that proposals to use such substitutes shall be made in addition to and separate from the base bid in order to receive consideration and the addition to or deduction from base bid, if any, shall be duly noted on the bid form.

D. Regarding substitutes, note that any deviations from the following specifications or any special equipment requirements (ambient conditions, services, power conditioning, etc.) necessary for full time operation shall be clearly stated and completely itemized. Failure to meet these stipulations could result in additional expense that would be assigned to this section of the work and not considered as an extra. These substitute proposals will not, however, be considered as a basis for determining the low bidder unless they are specifically listed by Addendum as alternate proposals. Each substitute proposal offered shall list the manufacturer, the catalog number of the substitute item, and the specified item to be replaced by the substitute. In addition to this information, state the amount to be added to or deducted from base bid in the event the substitute proposal is accepted.

E. for later consideration unless delivery schedules or other factors beyond the Contractor's control justify same.

F. If more than one make of material or equipment is specified, the proposed manufacturer, brand, type, etc. shall be identified. If this provision is not complied with, the Owner may then make this selection without change in contract price.

G. Note that in the following specifications, where more than one manufacturer is listed for a particular item of operating equipment, the design will be based on the first named. If equipment by the other named manufacturer(s) or a proposed substitute requires redesign work, revised/modified services, or specific additional field work by other trade(s), the price submitted for providing this equipment must include the required additional amount to cover such work.

H. Lump sum pricing by suppliers on two or more dissimilar classifications of materials, without an accompanying price breakdown on the individual classifications, will not be tolerated. Notify the Engineer, upon receipt of a lump-sum quotation which prevents a legitimate comparison with other competitive individual quotations.

12. SHOP DRAWINGS

A. Prepare or obtain from the manufacturer, certified shop or erection drawings of all items of equipment to be furnished under this section and submit copies of same as required for review. This shall be done as soon as possible, well prior to proceeding with installation or construction and in the proper sequence to avoid delays in the work, the work of the Owner or other contractors. Unless otherwise indicated, a minimum of six (6) hard-copy sets OR one (1) electronic set shall be submitted. These drawings shall be complete in every respect, showing pertinent details regarding size, external and internal features, mechanical and/or electrical arrangements, locations of connections, installation and mounting instructions, materials, gauges, electrical characteristics, wiring diagrams, and other information necessary to show compliance with the intent of the contract documents. Note that in the following items of this specification, where more than one equipment manufacturer is listed, the first named has been used as the basis for design. All departures or deviations in performance, service requirements, size, etc. from first named by the make submitted shall be noted on the shop drawings. Where departures or deviations do occur, the contractor shall additionally itemize same on the cover sheet that accompanies the submittals. Failure to do so will risk subsequent rejection at the job site. (With regard to voluntary substitutions, refer also to Item BIDDING in this specification and item EQUIPMENT CLEARANCES AND REQUIREMENTS.

B. By submitting such drawings, the Contractor represents that he has selected and verified the materials and equipment, taken necessary field measurements, noted field construction criteria, etc., related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and the Contract Documents.

C. Materials and equipment to be furnished for this project shall be of current production by manufacturers regularly engaged in the manufacture of such items. When two or more similar units are required, they shall be the product of one manufacturer.

D. The review of shop drawings shall not be construed as a complete check but will indicate only that the capacity, general method of construction and/or detailing is satisfactory. Carefully check and verify dimensions for installation and service requirements before ordering equipment for the project.

E. Submittals shall be itemized on a standardized shop drawing submittal form stating the name of the project, specification section, paragraph and/or

drawing numbers applicable to submittal and shall bear the contractor's review stamp as evidence that the items have been initially checked for compliance with Contract Documents as stated above.

F. After review, shop drawings will be returned five (5) hard-copy sets OR one (1) electronic set, marked in one of the following ways:

1. "NO EXCEPTIONS NOTED" - Copies may be distributed as required for construction, shipment, etc. to proceed.

2. "EXCEPTIONS NOTED" - Contractor may proceed with and/or authorize construction, shipment, etc. taking into account the necessary corrections.

3. "EXCEPTIONS NOTED - REVISE AND RESUBMIT" - Contractor will be required to resubmit shop drawings in their entirety. No fabrication, erection or installation shall be authorized or initiated until shop drawings so marked have been completely revised, resubmitted and subsequently marked in accordance with either of the two preceding subparagraphs. Only shop drawings officially marked "NO EXCEPTIONS NOTED" or "EXCEPTIONS NOTED" will be permitted on the jobsite.

G. Upon return of submittals take appropriate action as specified above. Note that any shop drawing hard-copies received beyond the number required will be destroyed (not returned).

H. Where resubmittal is required, four (4) hard-copies OR one (1) electronic copy will be so noted by the reviewer, of which two (2) hard-copies OR one (1) electronic copy will be returned for corrections (one (l) hard-copy for the contractor and one (l) hard-copy for the supplier/subcontractor).

I. The following is a list, where applicable, of items requiring submittals.

1. Secondary Switchgear

2. Panelboards

3. Data Communications Wiring

4. Motor Starters

5. Safety Switches

6. Lighting fixtures, Lamps, and Ballasts

7. Wiring Devices and Cover Plates

8. Battery Powered Emergency Lighting Units

9. Fuses

16. Surface Raceway

J. Note that submittal review is for general construction, detailing and application only. Carefully check and verify dimensions for installation as well as clearance and service requirements before ordering equipment for the project. In addition, where an elevator(s) is involved, verify all equipment specific electrical requirements with the selected equipment supplier in order to verify breaker type, feeder sizing, etc. At completion, the entire installation shall be such that all equipment will function and be serviceable in a normal and satisfactory manner.

K. Shop drawings will be provided by the Owner for any Owner furnished equipment requiring service or connections under this section.

I. A complete set of shop drawings, officially marked in the prescribed manner noted previously, shall be filed on the job site. Such drawings shall be kept together, maintained in good condition and shall be readily available for reference.

13. WORK BY OTHERS

A. Each bidder shall read the specifications for the other branches of work to clarify the points of division of responsibility between the various trades. The following work will be by others:

General construction and site work . . .

Plumbing . . .

Heating and air conditioning . . .

Painting, except as specifically included in this contract . . .

Telephone equipment and wiring . . .

Heating and air conditioning temperature control wiring and interlocks of automatic temperature control equipment not indicated on the electrical drawings

B. The foregoing list of items of work by others constitutes only the major

portion of such work, and is intended merely as a guide. Other minor items of such work to be done by others may appear elsewhere in these specifications or on the drawings.

14. SUPPORTING MEMBERS

A. Furnish and install all steel angles, channels, bars or clamps required to support any type of permanent apparatus to be furnished and/or installed under this section.

15. EQUIPMENT IDENTIFICATION

A. Provide nameplates on all items of equipment including those listed below:

Primary Switchgear

Secondary Switchgear

Unit Substation

Transformers

Panelboards

Motor Starters and Contactors

Safety/Disconnect Switches

Control Panels

Motor Control Centers

Automatic Transfer Switches

Bus Ducts

B. Nameplates shall be laminated phenolic with black surface and white core. Use 1/16" thick material for plates up to 2" X 4". For larger sizes use 1/8" thick material. Attach to equipment by non-rusting screws.

C. Lettering shall include name of equipment, the specific unit identification number and any reference to ON-OFF or other instructions that are applicable. On bus duct runs this identification shall include phases A-B-C, neutral and voltage.

D. Lettering shall be condensed gothic. The space between lines shall be

equal to the width of the letters. Use minimum l/4" high letters which will print approximately four to the inch. Increase letter size up to 3/4" on larger plates.

E. All wiring device cover plates shall have identification with regard to panel number, circuit number, item controlled, etc.

16. CLEAN UP

A. All rubbish resulting from the work herein specified shall be removed from the premises as fast as it accumulates.

B. Upon completion of the work, remove from the project site all tools, equipment, surplus materials and rubbish pertaining to the work under this contract heading. Responsibility for this shall include paying all costs for such removal and disposition including hauling, dumping, proper and legal disposal of hazardous materials, etc.

17. MAINTENANCE OF EXISTING FACILITIES

A. Prior to the severing of the electrical service to any portion of the existing building, submit a plan to the Architect and the Owner's Representative, stating the nature and duration of the proposed interruption, as well as the method of procedure. Do not under any circumstances proceed with an interruption of service of any type without the Owner's written authorization.

18. WORK IN EXISTING BUILDING

A. All electrical fixtures, outlets shown dotted and associated wiring and conduit, etc., located in the remodeled portions of the existing building shall be disconnected, abandoned and either removed or covered with a stainless steel plate as directed by the Architect/Engineer.

B. ing electrical circuits and outlets which are to stay in use shall remain on the existing electrical panels. New work shall be connected to the new panels unless indicated otherwise.

C. Existing circuits may be reused where convenient. All remaining lights, switches, receptacles, motors, etc., not disturbed in the remodeling shall be checked for proper operation and circuits disturbed by the remodeling work or in violation of N.E.C. shall be properly reconnected as required.

D. All cutting and patching of existing walls, floors and ceilings required for the installation of any and all electrical work in the remodeled portions of the existing building shall be done under this section. (See Item CUTTING

AND PATCHING).

E. All electrical work to be installed in finished rooms of the existing building shall be installed concealed unless otherwise noted on the drawings.

F. Painting of all patched work in the existing building will be the responsibility of others.

19. TESTING, LOAD BALANCE AND ADJUSTMENT

A. Load balancing, adjustments and electrical testing shall be done under this section of the work.

B. A person skilled in the field of electrical testing and operating with proper test equipment shall perform the following:

C. Balance panelboard feeder loads, distribution feeder loads and main feeder loads between phases.

D. Assure that proper phase relationships are maintained, before and after balancing, to prevent reverse rotation of rotating equipment.

E. Test polarity and circuit continuity at each receptacle.

F. Each special system installed under this contract, such as clock, fire alarm, sound, nurse call, etc. shall be inspected and operationally tested by a qualified representative of the equipment vendor.

G. Submit a written report of each test to the Architect immediately following the test.

20. RECORD DRAWINGS

A. Provide and keep on the job two complete print sets of the contract working drawings on which shall be legibly recorded any variations from such contract drawings, change orders or alterations to the work made during construction. Record print sets shall show any changes in:

Size, type, capacity, etc., of material, device or piece of equipment;

Location of devices or equipment;

Location of outlet or source in building service systems;

Routing of feeders, bus ducts, or other building services;

Schedule data;

B. These prints shall also show the location of all concealed pull boxes, feeders, etc., as well as electric services, obtained by actual field-measured dimensions to each such item from readily identifiable and accessible walls or corners of the building. Changes, modifications, etc., shall be recorded daily. In addition, the Contractor will be given an electronic set of drawings (disks) on which to permanently record such changes at the completion of the project.

C. During the course of the project these prints shall be kept clean and undamaged and shall not be used for any purpose other than recording deviations from contract drawings and exact locations of concealed work. They shall be available at all times for the Owner's and/or the Engineer's inspection.

D. When the job is completed, record prints shall be turned over to the Engineer for review. Subsequent to this review, the prints will be returned to the Contractor for use in preparing the updated electronic file. Unless otherwise indicated, this shall be done in either AutoCad 14 or AutoCad 2000 format.

E. Note that providing the completed "as built" electronic file is a requirement for project close-out.

21. INSTRUCTIONS AND MANUALS

A. Provide four complete brochures in hard backed binders, each containing all operating, servicing, and maintenance information as well as parts lists for all equipment installed under this contract. Where diagrams are too large for the binder, arrange manila pockets with reinforced holes to hold folded drawings. The binder shall also contain a title sheet showing the Contractor's name and address and an index sheet listing the contents of the manual. A copy shall be submitted to the Engineer for verification prior to being submitted to the Owner.

B. Information shall be complete, indexed, and bound as described above. The following shall be clearly printed on the front cover of the binder:

Project name, address and date.

Name and address of Architect-Engineer.

Section of Work covered, i.e., Electrical

Name and address of Contractor.

Telephone number of Contractor, including night or emergency numbers.

C. Incorporate, within the binders, individual sections containing an index sheet, written operating instructions, shop drawings, equipment catalog cuts, manufacturer's instructions, and a list of equipment into the binders.

First Page - Title of Job, Owner, Address, Date of Submittal, Name of Contractor and Name of Architect-Engineer...Emergency operating instructions and/or list of service organizations (including address and telephone numbers) capable of rendering emergency service on 24 hour calls shall be furnished.

Second Page - Index/Table of Contents

Third Page - Introduction to First Section...This shall contain a complete written description of the system.

First Section: A written description of system contents, where the system is actually located in the building, how each part functions individually and how the system works as a whole...Conclude with a list of the items requiring service and either state the service and frequency needed or refer to the manufacturer's data in the binder that describes the proper service.

Second Section: A copy of each approved shop drawing, (clearly marked to identify the item furnished) with an index at the beginning of the section...Provide a separate list of all lighting fixtures and luminaires used on the job. The list shall include but not be limited to fixture type, manufacturer's catalog number and voltage, number of lamps, lamp type, ballast catalog number, manufacturer's name and quantity when required, catalog number and quantity of any replacement glass and/or plastic parts.

Third Section: A copy of each manufacturer's operating instructions with an index at the beginning of the section.

Fourth Section: A list of all equipment used on the job, Contractor's purchase order numbers, supplier's name and address.

D. Arrange for technical instruction of the Owner's maintenance personnel for such time as would be reasonably required to acquaint them with their duties. In addition, deliver to the Owner all special tools or equipment required for making normal adjustments on any equipment or apparatus furnished under this contract heading.

E. Technical instructions involving installed equipment shall include a demonstration of the equipment and/or the operating system(s) with a description of the operation explained to the owner's representatives. It shall be this Contractor's responsibility to arrange this demonstration with the Owner as well as representatives of suppliers. The demonstration shall take place after all testing and balancing and written reports of such work have been submitted to and accepted by the Architect/Engineer. The time when the satisfactory completion of this technical instruction and demonstration takes place will establish the date of final acceptance of the system and/or project unless otherwise stipulated.

22. EQUIPMENT CLEARANCES AND REQUIREMENTS

A. For many items of equipment described in these drawings and specifications several manufacturers are listed. The first named in each instance is the make on which the layout was based and on which clearances, service requirements, electrical and plumbing characteristics, etc. have been checked.

B. Due to the possibility of restrictions imposed by space limitations, the responsibility for resolving conflicts resulting from the use of equipment other than first named or of alternate equipment shall rest with the equipment supplier and the Contractor. Submittals for this equipment will be considered as a statement that clearances for access, service, maintenance, etc. have been checked and found adequate.

C. Alternate equipment or the equipment of additional manufacturers named in these documents shall meet all base bid specifications. In the event such equipment, or any equipment which the bidder proposes to furnish, deviates from the requirements of equipment first named regarding electric service, power wiring, control wiring, plumbing and/or piping, sound attenuation, vibration damping, etc., it shall be the responsibility of the bidder to include in his price a sufficient sum to cover all additional costs or charges resulting therefrom.

23. CONTRACTORS' FOREMAN

A. With reference to the work under this section, a competent foreman shall be assigned to the project. The foreman shall remain on the job during all normal working hours until the project is complete and shall be authorized to act as the Contractor's agent in the absence of said Contractor. This foreman shall not be relieved of his duties on the project except by permission or by request of the Architect.

24. WARRANTIES

A. Provide warranties to the Owner that the materials and equipment furnished are new, unless otherwise specified, and that all work is of good quality, free from faults and defects and in conformance with the Contract Documents. Unless otherwise specified, all warrants shall extend for a period of 12 months or greater as noted below. However, latent defects in materials, equipment or workmanship that are not discovered until sometime during the second year following acceptance, shall remain the contractor's responsibility to correct.

B. Warranties on all work and equipment shall commence on the date of substantial completion of the work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. These warranties and all related documents shall be presented in writing prior to the issuance of any Certificates. Warranties shall include equipment manufacturer's written certificates warranting the equipment furnished complies with all requirements of the drawings and specifications. This documentation shall be submitted in an appropriately marked, 3-ring hard cover binder.

C. If, within one year after the date of substantial completion of the work or within one year after acceptance by the Owner or within such longer period of time as noted above or as may be prescribed by the terms of any applicable special warranty stipulated in the Contract Documents, any portion of the work is found to be defective, functioning improperly, or not in accordance with the Contract Documents, it shall be promptly corrected upon receipt of official notification to do so. This obligation shall survive termination of the contract.

25. HOISTS, RIGGING, TRANSPORTATION AND SCAFFOLDING

A. Provide all necessary scaffolding, staging, cribbing, tackle, hoists and rigging to locate the material, equipment, etc. of this section in its proper place on the project. All such temporary work shall be removed from the premises when no longer required.

B. Pay all costs related to the transportation of materials and equipment to the job site. These costs shall be covered in the bid as no additional allowance will be made by the Owner.

C. Scaffolding and hoisting equipment shall comply with requirements of all pertinent Federal, State and Local Laws and Codes.

26. HOUSEKEEPING PADS

A. Provide concrete housekeeping pads for all floor mounted equipment furnished under this section. Unless otherwise detailed, pads shall be nominally 4" high with edges chamfered 1". Concrete shall be minimum 2500 psi test and all surfaces shall be free of voids and rubbed smooth. Provide at least 2 dowel rods into floor for anchorage. Pad top shall be dead level and shall have a steel trowel finish.

27. EQUIPMENT PREPARATION

A. At the completion of the job, or at such time as a portion of the work is to be turned over to the Owner, thoroughly clean all equipment installed under this section of the work. This includes switchgear, lighting fixtures, wall plates, etc. and involves the removal of all traces of grease, dirt, dust, etc., as well as temporary labels, shipping tags and the like. Equipment shall be turned over in factory inspected condition. See Item PAINTING.

B. Lamping of fixtures, equipment identification, system testing and balancing, etc., shall be as described elsewhere in these specifications.

28. REMOVALS, ALTERATIONS AND REUSE

A. The demolition drawings may not show all existing walls, lighting fixtures, devices, etc. that are to be removed. Investigate the site and review all currently available drawings of the building to evaluate the work necessary to fulfill the requirements of the contract documents.

B. Conduit:

Conduit located in remodeled areas that is in good condition, compatible for use in the new layout, may be reused in the new system.

C. Boxes:

All existing boxes being removed shall not be reused.

D. Wire:

All wire that is to be installed shall be new.

E. Existing materials, equipment, lighting fixtures, devices, panelboards, conduit and wiring that is removed and not reused shall be disposed of or placed in storage as directed by the Owner's representative.

29. WIRE, CABLE AND CONNECTORS

A. All building feeder and branch circuit wiring not specifically shown or necessarily covered by code, shall be type THHN/THWN 600 volt insulation - 75 deg. C copper conductors, complying, with NEC Standards.

B. Any wire size not specifically noted on the plans shall be at least equal in capacity to the rating of the overcurrent device serving the item to be connected and, in addition, shall be sized in accordance with the requirements of Articles 210.19 (a) and 215.2 (b) of the N.E.C. Note that where wire sizes specifically shown on the drawings have ampacity in excess of the protection device rating, those sizes shall be the minimum provided.

C. Wiring run from fixture junction boxes and in fixture wireways shall be 600 volt, 90EC type THHN wire or RHH.

D. Conductors shall not be drawn into a conduit segment until that segment of the conduit system is complete, with all terminations properly bushed and with the conduit free of moisture, foreign material, etc.

E. All connectors and lugs shall be of the solderless type and large enough to enclose all strands of the conductors with sufficient mechanical strength to withstand vibration and normal strains.

F. All connectors for conductors sized #10 AWG and smaller shall be 3-M SCOTCHLOK, Ideal Wingnut or Buchanan B-Cap's. Connections for conductors sized #8 AWG and larger shall be made with pressure type mechanical connectors and insulated with electrical tape to 150% of the insulating value of the conductor insulation.

G. Joints or splices in branch circuit wiring and feeders must be located as per NEC. All joints and splices shall be made electrically and mechanically sound in accordance with best practice.

H. All parallel runs of conductors shall be cut to equal length and installed accordingly.

I. Note that common neutrals are prohibited. An individual neutral must be provided for each circuit.

J. Low voltage system wiring shall be sized in strict accordance with the individual equipment and/or system manufacturer's specifications and/or recommendations and shall be plenum rated when not run in conduit. In addition, the wire type utilized shall be as recommended by the equipment

manufacturer. Note that where code requirements dictate, or where specified, this wiring shall be run in conduit.

30. CIRCUIT AND CONDUCTOR IDENTIFICATION

A. All branch circuit wiring shall be color coded thruout this project. A record of this color code shall be turned over to the Owner. Each phase shall be a different color and the phase color shall be the same thruout the project including branch circuiting.

B. All feeders and conductors not color coded shall be identified with permanent, legibly marked, self-sticking labels stating circuit number, voltage, phasing and circuit origination. Labels shall be as manufactured by W. H. Brady Co. or approved equal. Labels made by embossing machines will not be acceptable.

31. CONDUIT AND OUTLET BOXES

A. All wiring to be installed for this project shall be enclosed in rigid or intermediate metal conduit (RMC or IMC) or electrical metallic tubing conduit (EMT).

B. All metal conduit shall be steel and in strict accordance with applicable ANSI standards for steel conduit. Each length shall bear the UL label.

C. Conduit thruout shall be a minimum 3/4" size except for special connections, as detailed, and flexible runouts to fixtures, motors, etc., which may be 3/8".

D. Flexible Conduit Connections:

Flexible runouts shall consist of flexible metal conduit made from square locked or interlocked galvanized steel strip. The maximum allowable length of a flexible runout shall be 6'-0".

Flexible connections to lighting fixtures, motor equipment, etc. shall originate from a conduit and junction box network, pull box, or fused disconnect switch. Fixture-to-fixture flexible connections will not be acceptable.

Flexible connections to weatherproof lighting fixtures, motors, equipment, etc. or controls mounted on dynamic equipment located in a damp or dusty location or exposed to the weather shall be made with UL listed liquid and vapor tight flexible conduit. Such conduit shall be designed and catalogued for maximum water resistance and shall be used with the appropriate fittings.

E. All conduit runs located in mechanical rooms or open machine shop areas shall be rigid (RMC) or intermediate (IMC). Terminations adjacent to equipment shall tie into flexible runouts. This requirement shall also apply for conduit installed in damp areas or exposed to the weather or that could be subject to mechanical damage.

F. Unless otherwise specified, conduit imbedded in poured concrete shall be PVC. Note that generally, conduit shall not be run in concrete floor slabs except where surface mounted fixtures are indicated, cast-in-place boxes are indicated, or where specifically directed.

G. Where patient care areas are involved, all branch circuits shall be installed in a metal raceway system which shall qualify as an equipment grounding return path in accordance with the National Electrical Code.

H. All conduit installed on the project shall be concealed, wherever possible, unless otherwise noted or indicated on the drawings or unless permission is obtained from the Architect to run exposed. Where conduit is exposed, it shall be run parallel or perpendicular to the building lines. (See Item MATERIALS AND WORKMANSHIP).

I. Steel set screw type fittings or compression type steel couplings and connectors shall be used with EMT and may be used with IMC.

J. All empty conduit including conduit installed under this section for others, such as telephone conduit and/or conduit for future systems, etc., shall be provided with solid steel pull wire or nylon pull cord.

K. Where switches or outlets occur in partitions, mullions, door frames, etc., which serve as an integral raceway, furnish partition type wall boxes and flexible metal conduit with conductors.

L. Watertight conduit expansion joints, bonding jumpers, etc., shall be provided wherever the construction dictates such devices.

M. Exposed conduit rising through floors to surface panels and boxes shall have a nominal 4" high concrete pad encasing the conduits at the floor line. See Item HOUSEKEEPING PADS.

N. Conduit accessories such as outlet boxes, condulets, bends, fittings, etc.,shall be manufactured by Appleton, Steel City, Russell and Stoll, Raco, Crouse Hinds or Midwest.

O. Fixture outlet boxes shall be standard 4" x 4" x 2" deep and shall be octagonal or square with standard fixture studs.

P. All outlet and device boxes shall be flush mounted in areas with finished surfaces. They shall be rigidly attached to the structure by means of steel straps or channels. Boxes shall be aligned true to building lines. Listed mounting heights and dimensions shall be to the centerline of the box.

Q. From each flush mounted panelboard or terminal cabinet provide four empty 1" conduits stubbed to an accessible area above the ceiling and, where applicable, provide two empty 1" conduits stubbed to an accessible area below the floor.

R. All conduit extending thru the roof shall be flashed by one of the following methods:

S. On built-up roofs flashing shall be installed using 24" X 24" 4 lb. per sq. ft. sheet lead pan. Flashing shall extend a minimum of 8" above the roof with rain shield located 3" above flashing. Lead shall be properly burned at joints by an experienced lead burner.

T. On membrane roofs flashing will be by the roofing contractor.

U. On sloped asphalt shingle type roofs, flashing shall consist of a 24 gauge galvanized steel flashing base with elastomeric compound collar based on Oatey Co. Series 11500 or equal.

V. Note: Penetrations thru roof and methods of sealing shall be coordinated with roofing manufacturer and roofing contractor.

32. JUNCTION BOXES AND ACCESS DOORS

A. Junction boxes, other than those furnished integrally with specific items of equipment or described elsewhere in the contract documents, shall be furnished and installed as required and shall be in strict accordance with NEC guidelines. Boxes shall be of minimum 12 ga. galvanized steel and shall have removable covers fastened with flat head countersunk bolts on maximum 8" centers. Note that where construction conditions dictate, junction boxes shall be watertight.

B. Junction boxes shall be labeled to indicate circuits within. Use black permanent markers with minimum 1" letters. Such markers shall be visible from point(s) of accessibility.

C. All boxes shall be installed in accessible locations or shall be provided with a suitable means of access. Where other acceptable means of access is not available, provide approved access doors of the proper size and type to meet accessibility requirements for the equipment involved.

D. Access doors in rated walls and plastered, gypsum board or similar ceilings that are rated shall be fire rated as required. They shall meet NFPA requirements and carry the UL 1-1/2 hour "B" label. Construction shall incorporate a minimum 20 ga. steel insulated panel door, self-latching lock and continuous hinge. These doors shall be factory treated with a rust inhibitor and given a baked enamel primer.

E. Access doors for other plastered surfaces shall be similar to Milcor Style K or L with 16 ga. steel frame and 14 ga. steel panel. A 22 ga. casing bead shall surround the frame and the unit shall be finished similar to the labeled doors.

F. Access doors for all other construction conditions shall be all aluminum with extruded frame. Doors shall have a continuous hinge and flush latch. The units shall have a brush satin finish and shall be of a model suitable for the type of construction in which they are installed.

G. Access doors shall be as manufactured by Acudor, Cierra, Karp, Larsen's or Milcor.

33. GROUNDING

A. Provide a complete grounding system as required to conform to the latest standards and to comply with all pertinent articles of the N.E.C.

B. Equipment grounding conductors shall be run with the circuit conductors and shall consist of insulated solid or stranded copper conductors. No conduit grounding methods will be permitted.

C. Note that all branch circuits serving patient care areas shall be installed in a metal raceway system.

D. All grounding system connections shall be exothermically welded. Installation shall be made in strict accordance with manufacturer's instructions, utilizing the proper mold, miscellaneous supplies, etc. for each connection. All material used, including mold, weld material, tools and accessories, shall be supplied by one manufacturer. The connection material shall be by Cadweld, Thermoweld, or approved equal.

E. Submit, for review, a written description of the method or methods to be used for grounding and the extent of the standards being implemented, taking into account the necessity for full compliance to applicable codes, ordinances and utility company requirements.

34. INSERTS, PENETRATIONS AND SLEEVES

A. Fabricated steel linear inserts shall be furnished and set wherever conduit, equipment, etc., is to be hung from poured-in-place concrete beams, slabs, or walls. These inserts, equal to the 1-5/8" channel width series by Unistrut, shall be selected based on the load carrying recommendations of the manufacturer. Where not provided, furnish and install acceptable types of supports appropriate for the application. Inserts for precast concrete members shall be of a type approved by the precast unit manufacturer.

B. Sleeves or sections of conduit (RMC) shall be furnished for all conduit penetrations of poured concrete and masonry work throughout. Sleeve material and installation shall be in accordance with the following list.

C. Floor Slabs Above Grade:

Exposed Areas - (normally accessible areas) Sch. 40 steel pipe - sleeve to extend 2" above finish floor.

Concealed Areas - (pipe chases, shafts, etc.) - Min. 20 gage galvanized sheet metal.

D. Walls - General:

Poured Concrete, Masonry - Heavy-wall PVC conduit or Sch. 40 steel pipe - sleeve ends to be flush with face of wall.

Stud/Gypsum Board - Min. 20 gage galvanized sheet metal with flanged ends set flush with face of wall.

E. Note that where the necessary provisions for conduit penetrations in poured concrete or masonry have not been made, core drilling will be required under this section of the specifications.

F. Walls - Fire Rated:

Where fire rated walls are sleeved, as described above, non-metallic sleeve material is prohibited.

G. Walls - Exterior:

Steel pipe sleeves in exterior walls shall be galvanized. All sleeves of steel pipe or PVC conduit shall be machine cut to provide finished ends.

H. Penetrations - General:

In all cases where conduit, bus duct etc., pass between floors, rated walls, and/or rated partitions, the spaces between the structure or sleeve and the penetrating member shall be provided with an approved firestop sealant to produce a fire, smoke, and water barrier. Sealant material and installation shall be as described in Item FIRESTOPPING.

I. Miscellaneous:

Provide polished brass or chrome plated steel pipe escutcheons on both sides of all conduit penetrations thru walls where exposed in finished areas of the building. They shall have concealed hinge and shall be securely attached with set screw.

Unused sleeves located in floors and/or walls shall be sealed. In finished areas, exposed sleeves shall then be finished to match adjacent surfaces. The sealant material shall be as previously described.

Note that sleeves for electrical work in areas scheduled to be shelled-in or otherwise not completed shall be set as required for future work.

35. WIRING DEVICES AND PLATES

A. All wiring devices shall be furnished in strict accordance with the catalog numbers listed on the drawings and here-in specified.

B. Switches:

Light switches shall be flush wall mounted, side and back wired design with ivory toggle. They shall be rated 20 amp - 120/277 volt AC, specification grade. Toggles shall be of high impact thermoplastic such as nylon. The following table lists acceptable manufacturers along with their appropriate catalog numbers for the various switch types.

Hubbell	P & S	A-H/Cooper	Bryant
1-pole	1221	20AC1 1991	4901
3-way	1223	20AC3 1993	4903
4-way	1224	20AC4 1994	4904

C. Receptacles, General:

All receptacles shall be flush wall mounted unless otherwise approved. The mounting heights are from centerline of device above finished floor. Standard mounting heights are listed on the legend and non-standard are

shown on the plan.

D. Convenience Receptacle, General Purpose:

Receptacle shall be a duplex 20 amp, 120 volt, 3 wire grounding type. The face shall be of high impact thermoplastic such as nylon. The strap shall wrap around the device. Ground contacts shall be mounted to the strap. An auto-ground clip shall be provided. The device shall be a Hubbell 5352-I, P & S 5362-I, A-H/Cooper 5735-1, Sierra 1462, or Bryant 5352-I.

E. Convenience Receptacle, High Abuse:

Receptacle shall be a duplex 20 amp, 120 volt, 3 wire grounding type with nylon face. The strap shall be one-piece brass with integral ground contacts...Hubbell 5362, Bryant 5362, A-H/Cooper 5739, P & S 5362 or approved equal.

F. GFCI Receptacle:

This device shall be provided where indicated on the drawings and shall be a Hubbell GF5352-I, P & S 1591-FI, A-H/Cooper GF5342-I, or Bryant GF5262R.

G. Wall Plates:

Provide wall plates for each device application. Standard plates shall be smooth thermoplastic such as nylon, lexan, or glass-reinforced polyester. Unless otherwise indicated, plate color shall match the device color. All materials shall meet appropriate design and test requirements of NEMA-WD1-1974 as well as UL Plates shall be Hubbell series P, Sierra series RP, or approved equal. Where required plates are not available as a standard in the material listed above, use plates made from stainless steel.

H. Weatherproof covers shall be of polycarbonate, cast aluminum or stainless steel construction.

Device plates shall have identification as described in item EQUIPMENT IDENTIFICATION.

Plates shall be attached by metal screws finished to match plate color.

Plates shall be installed in a vertical position, unless otherwise indicated, with an alignment tolerance of 1/32".

I. All receptacles served by emergency power shall be red in color and shall be covered by a stainless steel red "P" series standard color "P" series plate

with the word "emergency" engraved on the plate above the device opening.

Emergency light switching devices shall be red with a standard plate having the word EMERGENCY engraved above the device opening.

Emergency light switching devices shall be standard color with engraved stainless steel red "P" series standard color "P" series plates with the word "emergency" engraved on the plate above the device opening.

When a room is served by normal power and emergency power, then adhere to the following for emergency devices:

Duplex receptacles shall be red and the plate shall be a non-engraved red plate in electrical and mechanical equipment rooms. In all other rooms, devices shall be standard color and labels shall have red lettering on a white background.

Switches shall be red and the plate shall be a non-engraved red plate.

If a plate is to cover a normal device and an emergency device in the same box, the emergency device shall be red, the plate shall be standard (ivory) and shall be engraved with the word "emergency" above the emergency device.

36. LIGHTING FIXTURES

A. The lighting fixtures shown on the plans and indicated on the schedule shall be the basis for bidding.

B. Catalog numbers listed in the fixture schedule do not necessarily have complete prefix and suffix designations for the various applications. Therefore, these numbers shall be verified so that the fixtures will be made for the correct ballast voltage and will be supplied with all hangers, plaster frames, end caps, etc., required for a complete installation.

C. Immediately preceding the final inspection, thoroughly clean fixtures, removing all dust, dirt, finger marks, grease, etc. This shall include all lenses, louvers, etc.

D. General:

LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.

LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.

LED drivers shall include the following features unless otherwise indicated:

Minimum efficiency: 85% at full load.

Minimum Operating Ambient Temperature: -20˚ C. (-4˚ F.)

Input Voltage: 120 - 277V (±10%) at 60 Hz.

Integral short circuit, open circuit, and overload protection.

Power Factor: ≥ 0.95.

Total Harmonic Distortion: ≤ 20%.

Comply with FCC 47 CFR Part 15.

LED modules shall include the following features unless otherwise indicated:

Comply with IES LM-79 and LM-80 requirements.

Minimum CRI: 80 or higher. Minimum Color Fidelity Index (IES Rf): 80 or higher.

Color temperature between 3500° - 5000°K and as specified in the drawings' LIGHTING FIXTURE SCHEDULE.

Minimum Rated Life: 50,000 hours per IES L70.

Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.

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