

**Client:** Village of Oak Park  
**Project Name:** North Fire Station HVAC Replacement

**Project No.:** 24-123  
**Bid Due Date:** Friday, May 31st, 2024 @ 11:00 a.m.  
**Project Manager:** Vic Sabaliauskas  
 Building Maintenance Superintendent

### BID TAB WORKSHEET

Contractor	Base Bid Amount	Alternates	Total Bid Amount	EEO	Bid Bond
		None		M/W/DBE	
Oak Brook Mechanical Services <a href="mailto:marks@omshvac.com">marks@omshvac.com</a>	\$164,250.00	\$0.00	\$164,250.00	No	X
Premier Mechanical <a href="mailto:estimating@premier-mechanical-inc.com">estimating@premier-mechanical-inc.com</a>	\$196,000.00	\$0.00	\$196,000.00	No	X
F.E. Moran, Inc. <a href="mailto:june.tucker@femoran.com">june.tucker@femoran.com</a>	\$209,500.00	\$0.00	\$209,500.00	No	X



Office of the Secretary of State

ilsos.gov

# Business Entity Search

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## Entity Information

<b>Entity Name</b>	OAK BROOK MECHANICAL SERVICES, INC.		
<b>File Number</b>	50650782	<b>Status</b>	ACTIVE
<b>Entity Type</b>	CORPORATION	<b>Type of Corp</b>	DOMESTIC BCA
<b>Incorporation Date (Domestic)</b>	04-29-1975	<b>State</b>	ILLINOIS
<b>Duration Date</b>	PERPETUAL		
<b>Annual Report Filing Date</b>	03-19-2024	<b>Annual Report Year</b>	2024
<b>Agent Information</b>	BARON DAVID HARMON 30 E NORTH AVE NORTHLAKE ,IL 60164-2516	<b>Agent Change Date</b>	04-04-1989

## Services and More Information

Choose a tab below to view services available to this business and more information about this business.

[Purchase Master Entity Certificate of Good Standing](#)

[Change of Registered Agent and/or Registered Office](#)

[Articles of Amendment Effecting A Name Change](#)

[Adopting Assumed Name](#)



**SECTION VIII**  
**BID BOND**

WE Oak Brook Mechanical Services, Inc.

as PRINCIPAL, and Western Surety Company as SURETY, are held and firmly bound unto the Village of Oak Park, Illinois (hereafter referred to as "VOP") in the penal sum of Ten Percent (10%) of the total bid price, as specified in the invitation for bids. We bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly to pay to the VOP this sum under the conditions of this instrument.


WHEREAS THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that, the said PRINCIPAL is submitting a written bid to the VOP acting through its awarding authority for the completion of the work designated as the above section.

THEREFORE if the bid is accepted and an agreement awarded to the PRINCIPAL by the VOP for the above-designated section and the PRINCIPAL shall within fifteen (15) days after award enter into a formal agreement, furnish surety guaranteeing the faithful performance of the work, and furnish evidence of the required insurance coverage, all as provided in Specifications then this obligation shall become void; otherwise it shall remain in full force and effect.

IN THE EVENT the VOP determines the PRINCIPAL has failed to enter into a formal agreement in compliance with any requirements set forth in the preceding paragraph, then the VOP acting through its awarding authority shall immediately be entitled to recover the full penal sum set out above, together with all court costs, all attorney fees, and any other expense of recovery.

IN TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this 31st day of May A.D. 2024.

PRINCIPAL  
Oak Brook Mechanical Services, Inc. . \_\_\_\_\_  
(Company Name) (Company Name)

By:  Mark Sullivan By: \_\_\_\_\_  
(Signature & Title) President (Signature & Title)

(If PRINCIPAL is a joint venture of two or more Contractors, the company names, and authorized signatures of each Contractor must be affixed)

**BID BOND CONTINUED**

Subscribed to and Sworn before me on the

31st day of May, 2024.

Notary Public


**NAME OF SURETY** Western Surety Company

By: 

Signature of Attorney-in-Fact  
Christine Eitel

Subscribed to and Sworn before me on the

31st day of May, 2024.

  
Notary Public Courtney A. Flaska



# Western Surety Company

## POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

**James L Sulkowski, R B Schutz, Christine Eitel, Sherene L Hemler, Lucianne Bischoff, Mike Pohl, Kirk Liskiewitz, Courtney A Flaska, Samantha Bradtke, Individually**

of Schaumburg, IL, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

### - In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Vice President and its corporate seal to be hereto affixed on this 4th day of June, 2022.



WESTERN SURETY COMPANY

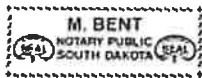
Paul T. Bruflat  
Paul T. Bruflat, Vice President

State of South Dakota }  
County of Minnehaha } ss

On this 4th day of June, 2022, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

March 2, 2026



M. Bent  
M. Bent, Notary Public

### CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 31st day of May, 2024.



WESTERN SURETY COMPANY

L. Nelson  
L. Nelson, Assistant Secretary

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**SECTION I**  
**REQUEST FOR BIDS**  
**INSTRUCTIONS AND SPECIFICATIONS FOR:**

**Village of Oak Park North Fire Station Mechanical Equipment Replacement**  
**Bid Number: 24-123**  
**Issuance Date: 4/17/2024**

The Village of Oak Park (VOP) will receive bids from qualified contractors to replace the existing mechanical equipment at the north fire station located at 212 Augusta in Oak Park, Illinois (hereinafter referred to as the "Project"). Bids will be accepted at the Public Works Center, 201 South Blvd., Oak Park, IL 60302 Monday through Friday, 7:30 a.m. to 4:00 p.m. local time until **11:00 a.m. on Friday, May 31<sup>st</sup>, 2024**. Bids will be reviewed in private and the results of the review will be presented to the VOP Board of Trustees.

**A mandatory pre-bid meeting will be held on Wednesday, April 24<sup>th</sup>, 2024 at 9:00 a.m. at the north fire station located at 212 Augusta in Oak Park, IL.** Bids received from bidders who do not send a representative to the pre-bid meeting will not be accepted.

Specifications and bid forms may be obtained at <http://www.oak-park.us/bid> or at the Public Works Center at the address listed above or by calling 708-358-5700.

The Village of Oak Park Board of Trustees reserves the right to accept or reject any and all bids or to waive technicalities, or to accept any item of any bid. Information is available from the Building Maintenance Superintendent, Vic Sabaliauskas at 708-358-5710 or [vics@oak-park.us](mailto:vics@oak-park.us).

Do not detach any portion of this document. Upon formal award to the successful bidder, a written agreement will be executed for the Project in substantially the form attached.

**Submission of Bids**

The bid shall be submitted on the bid form included herewith. The bid shall be submitted in a sealed envelope marked "BID: 24-123 Village of Oak Park North Fire Station Mechanical Equipment Replacement", shall bear the return address of the bidder, and shall be addressed as follows:

TO: Vic Sabaliauskas  
Building Maintenance Superintendent  
Department of Public Works  
201 South Blvd.  
Oak Park, IL 60302

**SECTION II**  
**BID INSTRUCTIONS, TERMS AND CONDITIONS**

**Preparation and Submission of Bid**

All bids must be delivered to the Public Works Center by the specific time indicated on the cover page. Bids arriving after the specified time will not be accepted. Mailed bids that are received by the Village after the specified hour will not be accepted regardless of the post-marked time on the envelope. Bids must be signed by an officer of the company who is authorized to enter into agreements on behalf of the company. Bids shall be sealed in an envelope and marked as stated on the cover page.

**Bid Bond**

The Bidder shall provide a bid bond in the amount of ten percent (10%) of the total bid price. The attached form may be used or the bidder may provide cash or a certified check in the amount specified. Bid bond amounts shall be based on all proposed work where estimated amounts have been provided by VOP. Do not include unit price amounts where work is "On-Demand" or "As Required". The bid bonds, cash or checks will be returned once the selected bidder has entered into an Agreement for this work and provided the contract bond in the amount of 100% of the total contract cost.

**Contract Bond**

The successful bidder shall, within ten (10) calendar days after award of the bid, furnish a contract bond in the amount of 100% of the total contract cost. The bond shall ensure faithful performance of the work, and the payment for materials, labor and of the subcontractors. The bond shall be with a surety or sureties with a rating of "A" or better by A.M. Best and Company and such sureties shall be approved by VOP. Bonds in the form of certified or cashier's check shall be made payable to the Village of Oak Park. The contract bond shall be furnished in the same number of copies as the number of copies of the Agreement to be executed. See section XII for a sample copy of the contract bond.

**Contract Term**

The initial contract term shall be from the date of award to November 30, 2024. The Village has the right to extend the contract term if a contract extension is warranted. The bidder shall commence work for the Project within fourteen (14) days of receipt of a notice to proceed from the Director of Public Works or the Building Maintenance Superintendent or his/her designee. All work shall be completed in accordance with the detailed specifications set forth herein, unless the Director of Public Works or the Building Maintenance Superintendent grants an extension.

**Recertification**

If the Village extends the contract for any period of time, the bidder shall provide the Village with a renewed certification in the form in Section V indicating that it continues to be eligible to contract with units of local government. If a contractor or subcontractor is not able to certify that it continues to meet all requirements, it shall provide a detailed explanation of the circumstances leading to the change in certification status.

**Award of Agreement**

The Agreement will be awarded in whole or in part to the responsible bidder whose bid, conforming to the request for bids, will be most advantageous to the Village; price and other factors considered.

**Costs of Preparation**

The Village will not be responsible for any expenses incurred in preparing and submitting a bid or entering into the applicable Agreement.

**Taxes not Applicable**

The Village of Oak Park, as an Illinois municipality, pays neither Illinois Sales Tax nor Federal Excise Tax (State Tax Exemption Identification Number VOP - E9998-1823-06 and PDOP – E9997-9934-07). Contractors should exclude these taxes from their prices.

**Withdrawal of Bids**

Any contractor may withdraw its bid at any time prior to the time specified in the advertisement as the closing time for the receipt of bids, by signing a request therefore. No contractor may withdraw or cancel its bid for a period of sixty (60) calendar days after the advertised closing time for the receipt of bids. The successful contractor may not withdraw or cancel its bid after having been notified that the bid was accepted by the VOP.

**Investigation of Contractors**

The VOP will make such investigations as are necessary to determine the ability of the contractor to fulfill bid requirements. If requested, the contractor should be prepared to present evidence to the VOP of ability and possession of necessary facilities and financial resources to comply with the terms of the attached specifications and bids. In addition, the contractor shall furnish the VOP with any information the VOP may request, and shall be prepared to show completed work of a similar nature to that included in its bid. The VOP reserves the right to visit and inspect the premises and operation of any contractor.

**Rejection of Contractor**

The VOP will reject any bid from any person, firm or corporation that appears to be in default or arrears on any debt, agreement or the payment of any taxes. The VOP will reject any bid from a contractor that failed to satisfactorily complete work for the VOP under any previous agreement.

**Conditions**

Contractors are advised to become familiar with all conditions, instructions and specifications governing the work. Contractors shall be presumed to have investigated the work site, conditions and scope of the work before submitting a bid.

**Compliance with Applicable Laws**

The bidder will strictly comply with all ordinances of the VOP and Village Code and laws of the State of Illinois.

### **Governing Law**

All agreements entered into by the VOP are governed by the laws of the State of Illinois without regard to conflicts of law. Any action brought to enforce an agreement with the VOP must be brought in the state and federal courts located in Cook County, Illinois.

### **Subletting of Agreement**

No agreement awarded by the VOP shall be assigned or any part sub-agreement without the written consent of the Village or as noted in the contractor's bid. In no case shall such consent relieve the contractor from its obligations or change the terms of the Agreement.

### **Interpretation of Agreement Documents**

Any contractor with a question about this bid may request an interpretation thereof from the VOP. If the VOP changes the bid, either by clarifying it or by changing the specifications, the VOP will issue a written addendum, and will email a copy of the addendum to all prospective bidders. The VOP will not assume responsibility for receipt of such addendum. In all cases, it will be the bidder's responsibility to obtain all addenda issued. Bidders will provide written acknowledgment of receipt of each addendum issued with the bid submission.

### **Minority Business and Women Business Enterprise Requirements**

The VOP, in an effort to reaffirm its policy of non-discrimination, encourages the efforts of contractors and subcontractors to take affirmative action in providing for Equal Employment Opportunity without regard to race, religion, creed, color, sex, national origin, age, handicap unrelated to ability to perform the job or protected veteran's status.

### **Licenses**

The contractor shall be responsible for becoming a licensed contractor in the Village of Oak Park.

### **Agreement**

The selected bidder shall enter into an Agreement with the Village of Oak Park to complete the Project in a form substantially similar to the Agreement attached hereto. The Agreement shall be executed by the contractor and returned, together with the contract bond within ten (10) calendar days after the Agreement has been issued to the contractor. The contractor shall execute three copies of the Agreement. One fully executed copy will be returned to the contractor. See Section XIII for a sample copy of the agreement.

### **Fees and Cost**

In the event any action is brought to enforce any agreement entered into by the VOP, or to collect any unpaid amount from the VOP, each party bears the responsibility of paying its own attorneys' fees and costs.

### **Dispute Resolution**

The VOP does not agree to the mandatory arbitration of any dispute.

**Village of Oak Park Logo or Likeness Use**

The official logo of the Village of Oak Park is not to be used in any form. Use of the Village logo is strictly prohibited by law and such use could subject the proposer to disqualification or termination of contract.

**Living Wage/Minimum Wage**

See Section XIII – Agreement.

**Hold Harmless**

See Section XIII - Agreement.

**Insurance**

See Section XIII - Agreement.

**Termination of Agreement**

See Section XIII - Agreement.

**SECTION III**  
**GENERAL SPECIFICATIONS**

**Scope of Work**

The Village of Oak Park is seeking bids from qualified contractors to replace the existing mechanical equipment at the north fire station with a new HVAC system that is to serve all interior areas of the station, including the basement, apparatus bay floor on the main level, and 2<sup>nd</sup> floor living quarters. See detailed specifications and design documents/drawings as prepared by StudioGC.

**Responsibility of Contractor**

The selected contractor shall furnish all labor, supervision, tools, equipment, materials and supplies, and other means necessary for performing and completing the work, including debris hauling, and shall obtain and pay for any required permits (permit fees to be waived by VOP).

**Extent of Services, Alterations, Omissions and Extra Work**

The VOP reserves the right to award the contract to the lowest qualified and responsible bidder.

The Village reserves the right to increase or decrease the quantity of any item or portion of the work, or to omit portions of the work as may be deemed necessary.

**Workers**

The contractor shall employ competent laborers and shall replace at the request of the Director of Public Works or the Building Maintenance Superintendent any incompetent, unfaithful, abusive or disorderly workers in their employ. Only workers expert in their respective branches of work shall be employed where special skill is required. Inappropriate behavior or examples of

unproductive work effort will not be tolerated. The Village has the right to require a contractor's employee to be immediately removed from the work crew if the above behavior is exhibited.

**Time of Work**

Bidder shall only work on weekdays, (Monday through Friday), from 7:30 a.m. to 4:00 p.m. No work will be allowed on weekends or on legal holidays as recognized by the Village, except as authorized by the Director of Public Works or the Building Maintenance Superintendent.

**Method of Payment**

The Village will pay monthly, all undisputed invoices within 30 days of approval as provided in the Local Government Prompt Payment Act, 50 ILCS505/4. The maximum interest rate for any payment not made within 30 days of approval is 1%.

**Standard of Care**

The contractor shall endeavor to perform the work for the Project with the same skill and judgment which can be reasonably expected from similarly situated firms or entities.

The contractor shall comply with all federal, state, and local statutes, regulations, rules, ordinances, judicial decisions, and administrative rulings applicable to its performance under this Agreement as applicable, including, but not limited to, Cook County's minimum wage and sick leave ordinances, respectively Cook County Ordinance Number 16-5768 and Cook County Ordinance Number 16-4229, and the Village's Living Wage Ordinance, Village of Oak Park Ordinance Number 16-093, codified as Section 2-6-20 of the Village Code, all as amended. Current copies attached as exhibit A.

The contractor shall ensure that the work for the Project is performed and completed in accordance with all applicable statutes, ordinances, rules, and regulations, including, but not limited to, the Fair Labor Standards Act; any statutes regarding qualification to do business; any statutes prohibiting discrimination because of, or requiring affirmative action based on race, color, religion, sex, national origin, ancestry, age, order of protection status, marital status, physical or mental disability, military status, sexual orientation, or unfavorable discharge from military service or other prohibited classification, including, without limitation, the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12101 *et seq.*, and the Illinois Human Rights Act, 775 ILCS 5/1-101 *et seq.* The Contractor shall also comply with all conditions of any federal, state, or local grant received by the Village or the contractor with respect to this Agreement.

**Certified Payroll**

Contractor shall be solely responsible to maintain accurate records reflecting its payroll for its employees who perform any of the work for the Village pursuant to this contract and shall submit certified payroll records to the Village's Director of Public Works or the Building Maintenance Superintendent at any time during the term of this contract. Contractor shall provide said certified payroll records within seven (7) days upon the request of the Director of Public Works or the Building Maintenance Superintendent.

### **Change Orders**

Change Orders: Changes in the work may be agreed to after execution of the Agreement, and without invalidating the Agreement, if the change order is in writing and signed. Any changes to the scope of work which result in an increase in the agreement price will be subject to an agreement addendum which must be signed by both parties. Any such change order will be prepared by the Village or the Village's consultant (Studio GC). The Contractor may only proceed with the change upon receipt of the written change order signed by the Village.

Emergency Changes: Contractor may perform work not included in the Scope of Work if necessary to remedy a condition that poses an immediate threat to persons or property. Work of this nature shall be carried out only to the extent of bringing the condition under control. The Village shall be notified immediately. A change order will then be negotiated and executed for the work performed, and for work remaining, if any.

Minor Changes (Field Orders): The Village may verbally authorize minor changes in the Scope of Work in order to prevent a delay in the progression of the work. These field orders may not involve a change in the agreement price or be inconsistent with the Scope of Work.

Changes Due to Unknown Conditions: The contractor is not responsible for changes in the work that are due to conditions that were not reasonably observable or conditions that have changed. In such cases, the contractor shall notify the Village and a change order will be negotiated.

Any change which results in a total agreement price in excess of \$10,000 must be approved by the Village of Oak Park Board of Trustees.

### **Correction of Work Prior To Final Payment**

The Village has the right to stop work if the contractor fails to carry out the work in a manner acceptable to the Village. If the Village deems the contractor's work unacceptable, at the Village's election, the contractor shall do one of the following:

1. Promptly repair or replace the defective work, without expense to the Village, including costs associated with repairing any damage to property caused by the replacement work; or;
2. If the Village deems it unacceptable to have the contractor correct work which has been incorrectly done, a deduction from the agreement price shall be made based on the costs to the Village to have the work repaired. Such a deduction from the agreement price shall in no way affect the Village's other remedies or relieve the contractor from responsibility for defects and related damage occurring as a result of defective or unacceptable work.

### **Bidder's Representative**

The bidder shall have at all times a competent foreman or superintendent on the job that shall have full authority to act for the bidder, and to receive and execute orders from the Director of Public Works or the Building Maintenance Superintendent or appointed representative. Any

instructions given to such superintendent or person executing work for the bidder shall be binding on the bidder as though given to him personally. Bidder's representative must be proficient in the use and interpretation of the English language.

### **Dispute Resolution**

All disputes, including collection disputes, shall be brought in the Circuit Court of Cook County, Illinois. This agreement shall be interpreted in accordance with the laws of the State of Illinois. In any dispute resolution process, each party shall bear its own costs, including attorney's fees. Any purported agreement between the parties that states terms contrary to this paragraph M will be deemed per se invalid.

### **Reporting Requirements**

The following forms must be completed in their entirety, notarized and included as part of the bid document. Failure to respond truthfully to any question on the list or failure to cooperate fully with further inquiry by the Village will result in disqualification of your bid.

### **Detailed Specifications:**

#### **1. Location of Work for the Project**

The location of the work is known as: Village of Oak Park North Fire Station, 212 Augusta, Oak Park, Illinois, 60302.

#### **2. Property Damage**

The bidder shall take great care to avoid damaging any and all Village-owned materials, supplies, equipment, and adjacent landscaping (trees, shrubs, turf, etc. if any exterior work is required). Bidder shall be held responsible for all damage to VOP property. All damage will be the responsibility of the bidder to repair to its original condition and to the satisfaction of the Village.

#### **3. Idling of Equipment**

The Department of Public Works has a "No Idling" policy. A copy of the policy is available from the Department of Public Works if needed. The bidder is expected to adhere to this policy as they are an extension of the Public Works Department staff.

#### **4. Periodic Inspection**

Upon request the contractor must provide the location of crews working within the Village. The Director of Public Works or the Building Maintenance Superintendent or his/her representative will periodically inspect the work and will always be available should any problems arise. The Director of Public Works and Building Maintenance Superintendent can be contacted at 708-358-5700.

#### **5. Obstruction of Streets and Rights-of-Way**

The bidder shall arrange to keep sidewalks and streets open for traffic when possible, and to block portions of the streets only when deemed necessary to protect private property.

The bidder shall remove all surplus materials and debris from the streets as the work progresses so that the public may have the use of the streets a maximum amount of time. Bidder is to erect appropriate warning signs and furnish adequate barricades that identify the work zone for the motoring public and pedestrians.

If street closure is necessary to facility any work the contractor must call Public Works at 708-358-5700 before closure and after opening the street so Village staff can alert police, fire, and regional transit of the closure.

6. Accident Prevention

The bidder shall exercise every precaution at all times for the protection of the persons and properties. The safety provisions of all applicable laws and ordinances shall be strictly observed. Any practice obviously hazardous in the opinion of the Director of Public Works or the Building Maintenance Superintendent or authorized representative shall be immediately discontinued by the bidder upon their receipt of instructions from the Director of Public Works or the Building Maintenance Superintendent, or authorized representative, to discontinue such practice.

The bidder shall abide by all applicable laws, standards, and regulations that apply to the completion of the work, including EPA and OSHA safety standards and regulations.

7. Motorized Equipment

Under no circumstances shall any motorized equipment be permitted to be driven on the private property or driveways without prior authorization from the resident and the Director of Public Works or the Building Maintenance Superintendent while performing work under the provisions of this contract. Plywood or other support or protection must be placed on the parkway and/or private property prior to operating or parking vehicles or equipment on or over such property or other support or protection must be placed on the private property prior to operating or parking vehicles or equipment on or over private property.

8. Parking

No off-street parking for equipment shall be provided for by the Village on any of the Village public properties except as may be designated by the Director of Public Works or the Building Maintenance Superintendent.

9. Traffic Control Plan

Bidder's item of work shall include furnishing, installing, maintaining, replacing, relocating and removing all traffic control devices used for the purpose of regulating, warning or directing traffic during work.

Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction, the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways, these Special Provisions, and any special details and Highway Standards contained herein and in the plans.

The governing factor in the execution and staging of work for their contract is to provide the motoring public with the safest possible travel conditions near the work zone. The bidder shall arrange their operations to keep the closing of any traffic lane(s) of the roadway to a minimum.

**10. Pedestrian Traffic Control**

While work is taking place, the bidder shall block off the sidewalk to pedestrian traffic immediately adjacent to the work site if there is a reasonable concern of harm to pedestrians.

**11. Operations of the Fire Department**

While work is taking place, contractor shall make every effort not to interfere with the operations of the VOP Fire Department. If any work is excepted to interrupt or interfere with Fire Dept. operations, contractor shall immediately notify the Public Works Director or Building Maintenance Superintendent and shall not commence with the work until agreed upon provisions are established and can be carried out.

**Additional Detailed Specifications:**

**1. Inspection and Project Meetings**

The Director of Public Works, Building Maintenance Superintendent or his/her designee will inspect the work daily and shall be available should any problems arise. The project supervisor should expect to meet with the Director of Public Works, Building Maintenance Superintendent or his/her designee as requested to discuss the past work completed and upcoming issues.

The Director of Public Works or Building Maintenance Superintendent may appoint a consultant to oversee the daily work and progress of this contract. In those cases, all issues related to the contract shall be run through the consultant.

**2. Resident Vehicle Parking Issues**

It shall be the bidder's responsibility to ensure the proposed work area each day is clear of vehicles. The Village will provide a limited number of VOP parking passes for the contract, but it will be the responsibility of the bidder to place the parking passes in worker's vehicles each day for the next day's work. Special attention should be paid to areas around schools and multi-unit dwellings to minimize impact to the residents. While the Village has an overnight parking ban, that cannot be relied on to provide clear streets. The Village will not assist the bidder with contacting residents or vehicle relocation if they have not properly posted parking restrictions.

3. Removal of Debris

All debris from work completed shall be removed from the site and from the Village of Oak Park the same business day debris has been created, unless authorized by Director of Public Works, Building Maintenance Superintendent or his/her designee. No onsite or Village owned areas will be designated as debris storage areas. Payment for removal and disposal of debris is to be included in the total contract cost.

Under no circumstances shall debris be left on the parkway or street over weekends or holidays. In addition, keeping debris off the street and parkway areas and out of the gutters prevents the debris from entering and plugging the sewer system. Environmentally accepted practices of debris disposal are also an important part of this work.

4. Reporting and Punch Lists

The bidder is responsible for keeping the Village updated on its work on a daily basis. The Village requires that the bidder provide a proposed and actual work schedule for each week of the contract. These records must be submitted to the Building Maintenance Superintendent via email each Monday. The report will include the proposed work to be completed at the north fire station for the week and an actual work completed report.

The Building Maintenance Superintendent or the Village's consultant will review the completed work and provide a punch list for work that has not met the specifications of the contract. The bidder will not be paid for punch list related work until the associated punch list items have been addressed and confirmed complete.

**SECTION IV**  
**BID FORM (Pricing)**

NAME: Oak Brook Mechanical Services, Inc.  
ADDRESS: 961 S. Route 83  
CITY: Elmhurst, IL. ZIP: 60126  
PHONE: (630)-941-3555 FAX: (   )-                      
E MAIL: marks@omshvac.com

TO: Village of Oak Park  
Public Works Department  
201 South Blvd  
Oak Park, IL 60302

Attn: Vic Sabaliauskas, Building Maintenance Superintendent

1. BASE BID

The Undersigned, having inspected the construction site and having familiarized themselves with the conditions likely to be encountered affecting the cost and schedule of the Work, and having thoroughly familiarized themselves with the Bidding Documents; hereby proposes to provide all labor, material, tools, equipment, utilities, transportation, supervision and services required for the proper execution of the entire Work required, in strict accordance with the Contract Documents for the **Village of Oak Park North Fire Station Mechanical Equipment Replacement** work prepared by StudioGC for the Total Bid Amount listed below:

TOTAL BID AMOUNT: \$ 164,250.00

One Hundred Sixty Four Thouand Two Hundred Fifty Dollars

and, if this proposal is accepted, agrees to execute a formal Contract subject to modifications as may be exercised by the Owner (Village of Oak Park) under alternate proposals.

2. SELF PERFORMING WORK

If the bidder intends to self-perform one or more major trade of work such as carpentry, masonry, mechanical, electrical, or plumbing, indicate trade(s) here: Mechanical

3. ALTERNATE PROPOSALS - NONE

4. UNIT PRICES - NONE

5. UNDERSTANDING: The Undersigned in submitting this proposal agrees to the following:

- a. Not to withdraw their proposal for a period of 60 days after the date of the Bid Opening.
  - b. To enter into and execute a Contract, if same is awarded to them on the basis of this Proposal, and to furnish Contract Bonds, within ten (10) days of a written "Notice to Proceed".
  - c. To construct the Work in accordance with the intent of the Contract documents.
  - d. That the owner reserves the right to reject any and all Bids and to waive irregularities in the Bidding, and to award the contract in its best interest.
  - e. That any alterations to this Bid Form will result in disqualification of the Bid.
  - f. To hold open all provided alternate prices for a period of 60 days after contract execution.
6. **CONTRACT DOCUMENTS:** The Undersigned acknowledges the following documents as the basis for their proposal:
- a. Instructions to Bidders.
  - b. Agreement: AIA Document A101, 2017 Edition by reference.
  - c. The General Conditions of the Contract for Construction, AIA Form A201, 2017 Edition by reference.
  - d. Supplementary General Conditions.
  - e. Project Manual, dated April 3, 2024, including all Divisions and Sections of the Specifications.
  - f. Drawings indexed on Sheet T-1 of the Drawings, all dated April 3, 2024.
  - g. Addenda: The undersigned further acknowledges receipt of Addenda as listed below and represents that any additions to, modifications of, or deletions from the Work specified, as called for in these Addenda, are included in the Base Bid Sum and the Alternates.

<u>ADDENDUM NO.</u>	<u>DATE</u>
1	5-6-2024
_____	_____
_____	_____
_____	_____

(NOTE: If no Addenda have been received, write "NONE".)

7. **BID SECURITY:** The undersigned shall attach to this Form of Proposal a Bid Bond, in an amount not less than 10% of the Base Bid amount, payable to the Village of Oak Park which is agreed will be forfeited to the City Council if the undersigned fails to execute the Standard Form of Owner/Contractor Agreement (AIA Document A-101, 2017 Edition), as modified herein as modified herein by the Supplementary Conditions and General Conditions of the Contract for Construction (AIA Document A201, 2017 edition), as modified herein by the Supplementary Conditions, and which is hereby made a part of this Contract Document by reference, and furnish evidence of their ability to become bonded and provide insurance coverage as specified, within five days after Owner's notification of the intent to award the contract to the undersigned.
8. In signing and submitting this bid, the undersigned certifies that all materials and construction to be provided are as specified in the proposed Contract Documents.
9. **TIME OF COMPLETION:** If awarded the Contract for Construction, the Bidder agrees to complete all work for the Owner's occupancy on or before the following dates:
- a. Commence Construction Work on site: On or before July 30, 2024
  - b. Final Completion of Work: November 30, 2024
10. **TAX EXEMPTION:** The Owner is exempt from the Illinois Sales and Use tax as an Illinois governmental unit. The Bidder shall exclude such taxes from consideration in preparing their bid.
11. **ADDRESS, LEGAL STATUS AND SIGNATURE OF BIDDER**

- a. The Undersigned hereby designates the address given below as the legal address to which all notices, directions, or other communications may be served or mailed.

Name of Firm or Joint Venture: \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_

Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

- b. The Undersigned hereby declares that the Bidder has the legal status indicated below.

- 1) If a partnership, give full names of all partners:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 2) If a corporation, indicate state in which incorporated:

Illinois

Affix Seal

- c. The Undersigned hereby affirms that they are qualified to do business in the State of Illinois.

- d. Signatures:

- 1) Individual, partnership or **corporation:**

Name: Oak Brook Mechanical Services, Inc.

By:  Mark Sullivan

Title: President

- 2) Parties to Joint Venture:

Name: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Proposal Signature:

*Mark Sullivan*

State of Illinois ) County of DuPage )

Mark Sullivan  
(Type Name of Individual Signing)

being first duly sworn on oath deposes and says that the bidder on the above bid is organized as indicated below and that all statements herein made on behalf of such bidder and that their deponent is authorized to make them, and also deposes and says that deponent has examined and carefully prepared their bid from the agreement specifications and has checked the same in detail before submitting this bid; that the statements contained herein are true and correct.

Signature of bidder authorizes the Village of Oak Park to verify references of business and credit at its option.

Signature of bidder shall also be acknowledged before a Notary Public or other person authorized by law to execute such acknowledgments.

Dated: May / 31 / 2024 Oak Brook Mechanical Services, Inc.  
Organization Name (Seal - If Corporation)

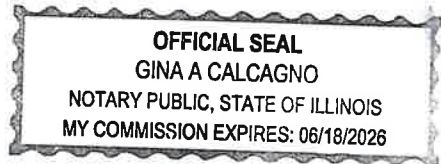
By:

*Mark Sullivan* 961 S. Route 83 Elmhurst, IL. 60126  
Authorized Signature Address

630-941-3555  
Telephone

Subscribed and sworn to before me this 31st day of May, 2024.

Gina A Calcagno in the State of Illinois. My Commission  
Notary Public  
Expires on 6 / 18 / 2026 *Gina A. Calcagno*



Complete Applicable Paragraph Below

(a) Corporation

The bidder is a corporation, which operates under the legal name of Oak Brook Mechanical Services Inc. and is organized and existing under the laws of the State of Illinois. The full names of its officers are:

President Mark Sullivan

Secretary Joseph Sullivan

Treasurer Mark Sullivan

The corporation does have a corporate seal. (In the event that this bid is executed by a person other than the President, attach hereto a certified copy of that section of Corporate By-Laws or other authorization by the Corporation that permits the person to execute the offer for the corporation.)

(b) Partnership  
Names, Signatures, and Addresses of all Partners

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The partnership does business under the legal name of \_\_\_\_\_, which name is registered with the office of \_\_\_\_\_ in the county of \_\_\_\_\_.

(c) Sole Proprietor  
The bidder is a Sole Proprietor whose full name is \_\_\_\_\_. If the bidder is operating under a trade name, said trade name is \_\_\_\_\_, which name is registered with the office of \_\_\_\_\_ in the county of \_\_\_\_\_.

Signed: \_\_\_\_\_  
Sole Proprietor

In compliance with the above, the undersigned offers and agrees, if his/her Bid is accepted within ninety (90) calendar days from date of opening, to furnish any or all of the items upon which prices are quoted, at the price set opposite each item, delivered at the designated point within the time specified above.

**MUNICIPAL QUALIFICATION REFERENCE SHEET**

Bidders shall furnish a minimum of four (4) references from projects similar in scope within the last two (2) years.

**MUNICIPALITY**      See attached  

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**ADDRESS**      

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**CONTACT**      

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**PHONE**      E-mail:

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**WORK**      

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**PERFORMED**      

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**MUNICIPALITY**      

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**ADDRESS**      

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**CONTACT**      

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**PHONE**      E-mail:

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**WORK**      

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**PERFORMED**      

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**MUNICIPALITY**      

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**ADDRESS**      

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**CONTACT**      

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**PHONE**      E-mail:

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**WORK**      

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**PERFORMED**      

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**MUNICIPALITY**      

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**ADDRESS**      

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**CONTACT**      

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**PHONE**      E-mail:

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**WORK**      

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**PERFORMED**      

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**MUNICIPAL PROJECTS**

Project Name: **DuPage County Community Center**  
Location: Wheaton, IL.  
Arch. /Eng. /Const. Mngr: Wight & Co.  
Contact Name & Number: Nick Sleboda 630-969-7000  
Contract Amount: \$1,100,000.00  
Description: HVAC & VRF

Project Name: **Village of Melrose Park**  
Location: Melrose Park, IL.  
Arch. /Eng. /Const. Mngr: Village of Melrose Park  
Contact Name & Number: Alex Scudiero/708-344-8409  
Contract Amount: Ongoing  
Description: Service

Project Name: **Village of Bloomingdale**  
Location: Bloomingdale, IL.  
Arch. /Eng. /Const. Mngr: Village of Bloomingdale  
Contact Name & Number: Calvin Boyd/630-893-7000  
Contract Amount: Ongoing  
Description: Service

Project Name: **Mayfair Rec Center**  
Location: Westchester, IL.  
Arch. /Eng. /Const. Mngr: Westchester Park District  
Contact Name & Number: Jim Berg/708-562-6410  
Contract Amount: \$57,800.00  
Description: HVAC

**SECTION V**  
**BIDDER CERTIFICATION**

Oak Brook Mechanical Services, Inc., as part of its bid on an agreement for the North Fire Station Mechanical Equipment Replacement Project for the Village of Oak Park, hereby certifies that said bidder selected is not barred from proposing on the aforementioned agreement as a result of a violation to either Section 33E-3 or 33E-4 of Article 33E of Chapter 38 of the Illinois Revised Statutes or Section 2-6-12 of the Oak Park Village Code relating to "Proposing Requirement.

  
\_\_\_\_\_  
(Authorized Agent of bidder selected)

Subscribed and sworn to before me this 31st day of May, 2024.

  
\_\_\_\_\_  
Notary Public's Signature

- Notary Public Seal -



**SECTION VI**  
**TAX COMPLIANCE AFFIDAVIT**

Mark Sullivan, being first duly sworn, deposes and says:

that he/she is President of  
(partner, officer, owner, etc.)

Oak Brook Mechanical Service,s Inc.  
(bidder selected)

The individual or entity making the foregoing bid or proposal certifies that he/she is not barred from entering into an agreement with the Village of Oak Park because of any delinquency in the payment of any tax administered by the Department of Revenue unless the individual or entity is contesting, in accordance with the procedures established by the appropriate revenue act, liability for the tax or the amount of the tax. The individual or entity making the bid or proposal understands that making a false statement regarding delinquency in taxes is a Class A Misdemeanor and, in addition, voids the agreement and allows the municipality to recover all amounts paid to the individual or entity under the agreement in civil action.

  
\_\_\_\_\_

By:  
Its: President

Mark Sullivan  
(name of bidder if the bidder is an individual)  
(name of partner if the bidder is a partnership)  
**(name of officer if the bidder is a corporation)**

The above statement must be subscribed and sworn to before a notary public.

Subscribed and sworn to before me this 31st day of May, 2024.

  
\_\_\_\_\_  
Notary Public's Signature



**SECTION VII**  
**ORGANIZATION OF BIDDING FIRM**

Please fill out the applicable section:

**A. Corporation:**

The Contractor is a corporation, legally named Oak Brook Mechanical Services, Inc. and is organized and existing in good standing under the laws of the State of Illinois. The full names of its Officers are:

President Mark Sullivan

Secretary Joseph Sullivan

Treasurer Mark Sullivan

Registered Agent Name and Address: Oak Brook Mechanical Services, Inc.  
961 S. Route 83 Elmhurst, IL 60126

The corporation has a corporate seal. (In the event that this bid is executed by a person other than the President, attach hereto a certified copy of that section of Corporate By-Laws or other authorization by the Corporation that permits the person to execute the offer for the corporation.)

**B. Sole Proprietor:**

The Contractor is a Sole Proprietor. If the Contractor does business under an Assumed Name, the Assumed Name is \_\_\_\_\_, which is registered with the Cook County Clerk. The Contractor is otherwise in compliance with the Assumed Business Name Act, 805 ILCS 405/0.01, et. seq.

**C. Partnership:**

The Contractor is a Partnership which operates under the name \_\_\_\_\_

The following are the names, addresses and signatures of all partners:


Signature	Signature

(Attach additional sheets if necessary.) If so, check here \_\_\_\_\_.

If the partnership does business under an assumed name, the assumed name must be registered with the Cook County Clerk and the partnership is otherwise in compliance with the Assumed Business Name Act, 805 ILCS 405/0.01, et. seq.

**D. Affiliates:** The name and address of any affiliated entity of the business, including a description of

the affiliation: Oak Brook Mechanical Services, Inc.

  
\_\_\_\_\_  
Signature of Owner



**SECTION VIII**  
**BID BOND**

WE See attached

as PRINCIPAL, and \_\_\_\_\_ as SURETY, are held and firmly bound unto the Village of Oak Park, Illinois (hereafter referred to as "VOP") in the penal sum of Ten Percent (10%) of the total bid price, as specified in the invitation for bids. We bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly to pay to the VOP this sum under the conditions of this instrument.

WHEREAS THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that, the said PRINCIPAL is submitting a written bid to the VOP acting through its awarding authority for the completion of the work designated as the above section.

THEREFORE if the bid is accepted and an agreement awarded to the PRINCIPAL by the VOP for the above-designated section and the PRINCIPAL shall within fifteen (15) days after award enter into a formal agreement, furnish surety guaranteeing the faithful performance of the work, and furnish evidence of the required insurance coverage, all as provided in Specifications then this obligation shall become void; otherwise it shall remain in full force and effect.

IN THE EVENT the VOP determines the PRINCIPAL has failed to enter into a formal agreement in compliance with any requirements set forth in the preceding paragraph, then the VOP acting through its awarding authority shall immediately be entitled to recover the full penal sum set out above, together with all court costs, all attorney fees, and any other expense of recovery.

IN TESTIMONY WHEREOF, the said PRINCIPAL and the said SURETY have caused this instrument to be signed by their respective officers this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 2024.

PRINCIPAL

\_\_\_\_\_  
(Company Name) (Company Name)

By: \_\_\_\_\_ By: \_\_\_\_\_  
(Signature & Title) (Signature & Title)

(If PRINCIPAL is a joint venture of two or more Contractors, the company names, and authorized signatures of each Contractor must be affixed)

**BID BOND CONTINUED**

Subscribed to and Sworn before me on the

\_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Notary Public

**NAME OF SURETY**

By: \_\_\_\_\_

Signature of Attorney-in-Fact

Subscribed to and Sworn before me on the

\_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Notary Public

**SECTION IX  
COMPLIANCE AFFIDAVIT**

I, Mark Sullivan, (Print Name) being first duly sworn on oath depose and state:

1. I am the (title) President of the Proposing Firm and am authorized to make the statements contained in this affidavit on behalf of the firm;
2. I have examined and carefully prepared this Bid based on the request and have verified the facts contained in the Bid in detail before submitting it;
3. The Proposing Firm is organized as indicated above on the form entitled "Organization of Proposing Firm."
4. I authorize the Village of Oak Park to verify the Firm's business references and credit at its option;
5. Neither the Proposing Firm nor its affiliates<sup>1</sup> are barred from proposing on this project as a result of a violation of 720 ILCS 5/33E-3 or 33E-4 relating to Bid rigging and Bid rotating, or Section 2-6-12 of the Oak Park Village Code relating to "Proposing Requirements".
6. The Proposing Firm has the M/W/DBE status indicated below on the form entitled "EEO Report."
7. Neither the Proposing Firm nor its affiliates is barred from agreementing with the Village of Oak Park because of any delinquency in the payment of any debt or tax owed to the Village except for those taxes which the Proposing Firm is contesting, in accordance with the procedures established by the appropriate revenue act, liability for the tax or the amount of the tax. I understand that making a false statement regarding delinquency in taxes is a Class A Misdemeanor and, in addition, voids the agreement and allows the Village of Oak Park to recover all amounts paid to the Proposing Firm under the agreement in civil action.
8. I am familiar with Section 13-3-2 through 13-3-4 of the Oak Park Village Code relating to Fair Employment Practices and understand the contents thereof; and state that the Proposing Firm is an "Equal Opportunity Employer" as defined by Section 2000(E) of Chapter 21, Title 42 of the United States Code Annotated and Federal Executive Orders #11246 and #11375 which are incorporated herein by reference. **Also complete the attached EEO Report or Submit an EEO-1.**
9. I certify that the Contractor is in compliance with the Drug Free Workplace Act, 41 U.S.C.A, 702

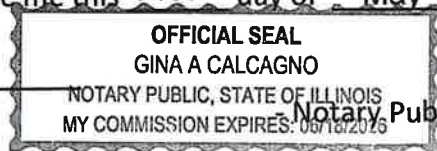
Signature: 

Name and address of Business: Oak Brook Mechanical Services, Inc.  
961 S. Route 83 Elmhurst, IL. 60126

Telephone 630-941-3555 E-Mail marks@omshvac.com

Subscribed to and sworn before me this 31st day of May, 2024.

  
Notary Public



<sup>1</sup> Affiliates means: (i) any subsidiary or parent of the agreementing business entity, (ii) any member of the same unitary business group; (iii) any person with any ownership interest or distributive share of the agreementing business entity in excess of 7.5%; (iv) any entity owned or controlled by an executive employee, his or her spouse or minor children of the agreementing business entity.

**SECTION X**  
**M/W/DBE STATUS AND EEO REPORT**

Failure to respond truthfully to any questions on this form, failure to complete the form or failure to cooperate fully with further inquiry by the Village of Oak Park will result in disqualification of this bid. For assistance in completing this form, contact the Department of Public Works at 708-358-5700.

1. Contractor Name: Oak Brook Mechanical Services, Inc.

2. Check here if your firm is:

- Minority Business Enterprise (MBE) (A firm that is at least 51% owned, managed and controlled by a Minority.)
- Women's Business Enterprise (WBE) (A firm that is at least 51% owned, managed and controlled by a Woman.)
- Owned by a person with a disability (DBE) (A firm that is at least 51% owned by a person with a disability)
- None of the above

[Submit copies of any W/W/DBE certifications]

3. What is the size of the firm's current stable work force?

50 Number of full-time employees

0 Number of part-time employees

4. Similar information will be requested of all subcontractors working on this agreement. Forms will be furnished to the lowest responsible Contractor with the notice of agreement award, and these forms must be completed and submitted to the Village before the execution of the agreement by the Village.

Signature: 

Date: 5-31-2024

**EEO REPORT**

Please fill out this form completely. Failure to respond truthfully to any questions on this form, or failure to cooperate fully with further inquiry by the Village of Oak Park will result in disqualification of this Bid. An incomplete form will disqualify your Bid. For assistance in completing this form, contact the Purchasing Department at 708-358-5473.


An EEO-1 Report may be submitted in lieu of this report.

Contractor Name Oak Brook Mechanical Services, Inc.

Total Employees \_\_\_\_\_

Job Categories	Total Employees	Total Males	Total Females	Males			Females			Total Minorities
				Black	Hispanic	American Indian & Alaskan Native	Asian & Pacific Islander	Black	Hispanic	
Officials & Managers										
Professionals	2	2								
Technicians	19	19								
Sales Workers	8	8								
Office & Clerical	6	1	5							
Semi-Skilled	1	1								
Laborers										
Service Workers										
<b>TOTAL</b>										
Management Trainees										
Apprentices										

This completed and notarized report must accompany your Bid. It should be attached to your Affidavit of Compliance. Failure to include it with your Bid will be disqualify you from consideration.

**Mark Sullivan**  being first duly sworn, deposes and says that he/she is the **President** (Title or Officer) of **Oak Brook Mechanical Services, Inc.**

and that the above EEO Report information is true and accurate and is submitted with the intent that it

be relied upon. Subscribed and sworn to before me this **31st** day of **May**, 20**24**

( Signature ) \_\_\_\_\_ ( Date ) \_\_\_\_\_

**SECTION XI**  
**NO BID EXPLANATION**

If your firm does not wish to propose on the attached specifications, the Village of Oak Park would be interested in any explanation or comment you may have as to what prevented your firm from submitting a bid.

**Bid Name: Project No. 24-123; Village of Oak Park North Fire Station Mechanical Equipment Replacement Project**

Comments:

Signed: \_\_\_\_\_

Phone: \_\_\_\_\_

**SECTION XII**  
**CONTRACT BOND**  
**(For Reference – Do Not Fill Out)**



**Contract Bond**

\_\_\_\_\_, as PRINCIPAL, and  
\_\_\_\_\_ as SURETY, are held and firmly bound unto the  
Village of Oak Park (hereafter referred to as "Village") in the penal sum of  
\_\_\_\_\_, well and truly to be paid to the  
Village, for the payment of which its heirs, executors, administrators, successors and assigns,  
are bound jointly to pay to the Village under the conditions of this instrument.

**WHEREAS**, THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH that, the Principal has entered into a written contract with the Village, acting through its President and Board of Trustees, for the construction of work, which contract is hereby referred to and made a part hereof as if written herein at length, and whereby the Principal has promised and agreed to perform the work in accordance with the terms of the contract, and has promised to pay all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished to such Principal for the purpose of performing such work, including paying not less than the prevailing rate of wages in Cook County, where the work is for the construction of any public work subject to the Prevailing Wage Act, and has further agreed to save and indemnify and keep harmless the Village against all liabilities, judgments, costs and expenses which may in any manner accrue against the Village in consequence of granting such contract or which may in any manner result from the carelessness or neglect of the Principal, his agents, employees or workmen in any respect whatever; and has further agreed that this bond will inure to the benefit of any person, firm, company, or corporation, to whom any money may be due from the Principal, subcontractor or otherwise, for any such labor, materials, apparatus, fixtures or machinery so furnished and that suit may be maintained on such bond by any such person, firm, company, or corporation, for the recovery of any such money.

**NOW THEREFORE**, if the Principal shall well and truly perform the work in accordance with the terms of the contract, and shall pay all sums of money due or to become due for any labor, materials, apparatus, fixtures or machinery furnished to it for the purpose of constructing such work, and shall commence and complete the work within the time prescribed in the contract, and shall pay and discharge all damages, direct and indirect, that may be suffered or sustained on account of such work during the time of performance thereof and until the work shall have been accepted, and shall save and indemnify and keep harmless the Village against all liabilities, judgments, costs and expenses which may in any manner accrue against the Village in consequence of granting such contract or which may in any manner result from the carelessness or neglect of the Principal, his agents, employees or workmen in any respect

**CONTRACT BOND CONTINUED**

whatever; and shall in all respects fully and faithfully comply with all the provisions, conditions, and requirements of the contract, then this obligation will be void; otherwise it will remain in full force and effect.

**IN WITNESS WHEREOF**, the PRINCIPAL and the SURETY have caused this instrument to be signed by their respective officers this \_\_\_\_ day of \_\_\_\_\_, 2024.

**NAME OF PRINCIPAL**

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Printed Name

Its: \_\_\_\_\_  
Title

Subscribed to and Sworn before me on the  
\_\_\_\_ day of \_\_\_\_\_, 2024

\_\_\_\_\_  
Notary Public

**NAME OF SURETY**

By: \_\_\_\_\_  
Signature of Attorney-in-Fact

Subscribed to and Sworn before me on the  
\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_  
Notary Public

**SECTION XIII**  
**AGREEMENT**

**(For Reference – Do Not Fill Out)**



**INDEPENDENT CONTRACTOR AGREEMENT**

**THIS INDEPENDENT CONTRACTOR AGREEMENT** (“Contract”) is entered into on this \_\_\_\_\_ day of \_\_\_\_\_, 2024, by and between the Village of Oak Park, an Illinois home rule municipal corporation (hereinafter the “Village”), and \_\_\_\_\_ a \_\_\_\_\_ (hereafter the “Contractor”).

**WHEREAS**, Contractor submitted a Bid dated \_\_\_\_\_, \_\_\_\_\_, a copy of which is attached hereto and incorporated herein by reference, to provide \_\_\_\_\_ (hereinafter referred to as the “Work”) for the \_\_\_\_\_ (hereinafter referred to as the “Project”) pursuant to the Village’s Request for Bids dated \_\_\_\_\_, \_\_\_\_\_, incorporated herein by reference as though fully set forth; and

**WHEREAS**, the Contractor represented in said Bid that it has the necessary personnel, experience, and competence to promptly complete the Project and the Work required hereunder (hereinafter referred to as the “Work”); and

**WHEREAS**, it is the intent of the Village and Contractor that the Contractor shall perform the Work pursuant to the terms and conditions of this Contract.

**NOW, THEREFORE**, in consideration of the premises and the mutual promises contained in this Contract, and other good and valuable consideration received and to be received, it is mutually agreed by and between the parties as follows:

**1. RECITALS INCORPORATED**

The above recitals are incorporated herein as though fully set forth.

**2. SCOPE OF WORK**

The Contractor shall perform the Project in accordance with its Bid in an amount not to exceed \$\_\_\_\_\_ (“Contract Price”). The Contractor shall complete the Project in

accordance with any applicable manufacturers' warranties and in accordance with the Village's Request for Bids, the Contractor's Bid and this Contract, all of which together shall constitute the Contract Documents. The Contractor hereby represents and warrants that it has the skill and experience necessary to complete this project in a good and workmanlike manner. The Contractor further represents and warrants that the Project will be completed in a good and workmanlike manner in accordance with the Contract Documents, and that the Project will be free from defects.

The Contractor shall achieve completion of all work required pursuant to the Contract Documents ("Contract Time"). The Contract Time is of the essence. In the event the Contractor fails to complete the Project on or before said date, the Village shall be entitled to liquidated damages in the amount of \$500.00 per day for each day the work remains uncompleted beyond the completion date set forth above. This amount is not a penalty, and the parties agree to said amount given the difficulties associated with determining or calculating damages to the Village in the event the Project is not completed on time. The Contractor shall have no claim for damages, for compensation in excess of the Contract Price, or for a delay or extension of the Contract Time based upon conditions found at, or in the vicinity of, the site.

### **3. DESIGNATED REPRESENTATIVES**

Contractor shall designate in writing a person to act as its designated representative with respect to the Work to be performed under this Contract who shall have the power and authority to make or grant or do all things, certificates, requests, demands, approvals, consents, notices and other actions required that are ministerial in nature or described in this Agreement for and on behalf of Contractor and with the effect of binding Contractor. The Village is entitled to rely on the full power and authority of the person executing this Contract on behalf of Contractor as having been properly and legally given by Contractor. Contractor shall have the right to change its designated representative by providing the Village with written notice of such change which notice shall be sent in accordance with Section 13 of this Agreement.

The Village's Public Works Director or the Director's designee shall be deemed the Village's authorized representative for purposes of this Agreement, unless applicable law requires action by the Corporate Authorities, and shall have the power and authority to make or grant or do those things, certificates, requests, demands, approvals, consents, notices and other actions required that are ministerial in nature or described in this Agreement for and on behalf of the Village and with the effect of binding the Village as limited by this Contract. Contractor is entitled to rely on the full power and authority of the person executing this Agreement on behalf of the Village as having been properly and legally given by the Village. The Village shall have the right to change its authorized representative by providing Contractor with written notice of such change which notice shall be sent in accordance with Section 13 of this Agreement.

#### **4. TERM OF CONTRACT, CONTRACT RENEWAL, AND RATE ADJUSTMENT**

The Contractor shall perform the Work pursuant to this Contract beginning on the effective date as defined herein and shall expire on December 31, 2024.

The Village will have the right to renew the contract for two (2) additional one (1) year terms with all terms and conditions, other than price, remaining the same. The Village will allow the Bidder to increase or decrease the contract price for each annual renewal.

Upon written request from the Bidder, on or before October 20 of each year of the Agreement, the cost of the services provided under the Agreement may be adjusted as follows:

The contractor shall submit a request for adjustment to the Village based upon the average of the published monthly Index (as defined below) for the period October through September for the previous year. The Index shall be the United States Department of Labor, Bureau of Labor Chicago Statistics, Revised Consumer Price Index for all Urban Wage Earners for Chicago-Naperville-Elgin, IL-IN-WI (all items, 1982-84 = 100).

Notwithstanding anything contained in this Request for Bids to the contrary, an annual adjustment shall not be greater than five percent (5.0%) of the previous year's cost for services provided under this Agreement in any year.

Any applicable adjustment shall take effect on January 1st.

#### **5. PAYMENT SCHEDULE**

Contractor shall, as a condition precedent to its right to receive any payment, submit to the Village an application for payment and such receipts, vouchers, and other documents as may be necessary to establish the Contractor's payment for all labor and material and the absence of any interest whether in the nature of a lien or otherwise of any party in any property, work, or fund with respect to the Work performed hereunder. Such documents shall include, where relevant, the following forms, copies of which are attached hereto:

- (i) Contractor's sworn statement;
- (ii) Contractor's partial or final waiver of lien;
- (iii) Subcontractor's sworn statement(s); and
- (iv) Subcontractor's partial or final waiver of lien.

Payment by the Village shall be conditioned upon an inspection by the Village of the Work completed and submission of required waivers by the Contractor. Payment by the Village shall in no way constitute a waiver of, or relieve the Contractor from, any defects in the work. All payments shall be made in accordance with the Illinois Local Government

Prompt Payment Act, 50 ILCS 505/1 *et seq.* Final payment for any Work performed by the Contractor pursuant to an invoice by Contractor shall be made by the Village to the Contractor when Contractor has fully performed the work and the work has been approved by the Village and submission of required waivers and paperwork by Contractor. Approval of the work and issuance of the final payment by the Village shall not constitute a waiver of, or release Contractor from, any defects in the work.

The Village shall have the right to withhold from any payment due hereunder such amount as may reasonably appear necessary to compensate the Village for any actual or prospective loss due to Work which is defective or does not conform to the Contract Documents; damage for which Contractor is liable hereunder; liens or claims of liens; claims of third parties, subcontractors, or material men; or any failure of the Contractor to perform any of its obligations under this Contract. The Village may apply any money withheld or due Contractor hereunder to reimburse itself for any and all costs, expenses, losses, damages, liabilities, suits, judgments, awards, and attorney's fees incurred, suffered, or sustained by the Village and chargeable to Contractor.

## **6. TERMINATION**

The Village may terminate this Contract for cause, which includes but is not necessarily limited to, the Contractor's failure to perform the work pursuant to this Contract. The Village shall provide the Contractor with five (5) days' written notice of a termination for cause pursuant to the provisions of Section 13 below. The Village may also terminate this Contract when it determines the same to be in its best interests by giving fourteen (14) days' written notice to the Contractor pursuant to the provisions of Section 13 below. In such event, the Village shall pay to the Contractor all amounts due for the work performed up to the date of termination.

## **7. DEFAULT/THE VILLAGE'S REMEDIES.**

If it should appear at any time prior to payment for the Work provided pursuant to this Contract that the Contractor has failed or refused to prosecute, and is in default, or has delayed in the prosecution of, the Work to be provided pursuant to this Contract with diligence at a rate that assures completion of the Work in full compliance with the requirements of this Contract, or has attempted to assign this Contract or the Contractor's rights under this Contract, either in whole or in part, or has falsely made any representation or warranty, or has otherwise failed, refused, or delayed to perform or satisfy any other requirement of this Contract or has failed to pay its debts as they come due ("Event of Default"), and has failed to cure, or has reasonably commenced to cure any such Event of Default within fifteen (15) business days after Contractor's receipt of written notice of such Event of Default, then the Village shall have the right, at its election and without prejudice to any other remedies provided by law or equity, to pursue any one or more of the following remedies:

(A) The Village may require Contractor, within such reasonable time as may be fixed by the Village, to complete or correct all or any part of the Work that are defective, damaged, flawed, unsuitable, nonconforming, or incomplete and to take any or all other action necessary to bring Contractor and the Work into compliance with this Contract;

(B) The Village may accept the defective, damaged, flawed, unsuitable, nonconforming, incomplete, or dilatory Work or part thereof and make an equitable reduction;

(C) The Village may terminate this Contract without liability for further payment of amounts due or to become due under this Contract except for amounts due for Services properly performed prior to termination;

(D) The Village may withhold any payment from Contractor, whether or not previously approved, or may recover from Contractor any and all costs, including attorneys' fees and administrative expenses, incurred by the Village as the result of any Event of Default or as a result of actions taken by the Village in response to any Event of Default; or

(E) The Village may recover any damages suffered by the Village as a result of Contractor's Event of Default.

(F) In addition to the above, if Contractor fails to complete any required Work pursuant to this Contract, the Village shall be entitled to liquidated damages in the amount of five hundred dollars (\$500.00) per day for each day the Services remains uncompleted. This amount is not a penalty, and the parties agree to said amount given the difficulties associated with determining or calculating damages to the Village in the event the required Work is not completed on time.

## **8. COMPLIANCE WITH APPLICABLE LAWS**

Contractor shall comply with all applicable laws, regulations, and rules promulgated by any federal, state, county, municipal and/or other governmental unit or regulatory body now in effect during the performance of the work. By way of example only and not as a limitation, the following are included within the scope of the laws, regulations and rules with which the Contractor must comply: all forms of workers' compensation Laws, all terms of the equal employment opportunity rules and regulations of the Illinois Department of Human Rights, statutes relating to contracts let by units of government, and all applicable civil rights and anti-discrimination laws and regulations.

## **9. INDEMNIFICATION**

To the fullest extent permitted by law, Contractor shall waive any right of contribution

against the Village and shall indemnify and hold harmless the Village and its officers, officials, employees, volunteers and agents from and against all claims, damages, losses and expenses, including, but not limited to, legal fees (attorney's and paralegal's fees, expert fees and court costs) arising out of or resulting from the performance of the Contractor's work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or injury to or destruction of property, other than the work itself, including the loss of use resulting therefrom, or is attributable to misuse or improper use of trademark or copyright-protected material or otherwise protected intellectual property, to the extent it is caused in whole or in part by any wrongful or negligent act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right to indemnity which the Village would otherwise have. Contractor shall similarly protect, indemnify and hold and save harmless, the Village, its officers, officials, employees, volunteers and agents against and from any and all claims, costs, causes, actions and expenses, including, but not limited to, legal fees incurred by reason of the Contractor's breach of any of its obligations under, or Contractor's default of, any provisions of this Contract. The indemnification obligations under this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under Workers' Compensation or Disability Benefit Acts or Employee Benefit Acts.

## **10. INSURANCE**

Contractor shall at Contractor's expense secure and maintain in effect throughout the duration of this Contract, insurance of the following kinds and limits set forth in this Section. Contractor shall furnish "Certificates of Insurance" to the Village before beginning work on the Project pursuant to this Contract. All insurance policies shall be written with insurance companies licensed to do business in the State of Illinois and having a rating of at least A according to the latest edition of the Best's Key Rating Guide; and shall include a provision preventing cancellation of the insurance policy unless thirty (30) days prior written notice is given to the Village. This provision shall also be stated on each Certificate of Insurance: "Should any of the above described policies be canceled before the expiration date, the issuing company shall mail fifteen thirty (30) days written notice to the certificate holder named to the left."

The limits of liability for the insurance required shall provide coverage for not less than the following amounts, or greater where required by law:

(A) **Commercial General Liability:**

i. Coverage to include Broad Form Property Damage, Contractual and Personal Injury.

ii. Limits:

General Aggregate	\$ 2,000,000.00
Each Occurrence	\$ 1,000,000.00
Personal Injury	\$ 1,000,000.00

iii. Coverage for all claims arising out of the Contractor's operations or premises and anyone directly or indirectly employed by the Contractor.

(B) **Workers' Compensation:**

i. Workers' compensation insurance shall be provided in accordance with the provisions of the laws of the State of Illinois, including occupational disease provisions, for all employees who perform the Work pursuant to this Contract, and if work is subcontracted pursuant to the provisions of this Contract, Contractor shall require each subcontractor similarly to provide workers' compensation insurance. In case employees engaged in hazardous work under this Contract are not protected under the Workers' Compensation Act, Contractor shall provide, and shall cause each subcontractor to provide, adequate and suitable insurance for the protection of employees not otherwise provided.

(C) **Comprehensive Automobile Liability:**

i. Comprehensive Automobile Liability coverage shall include all owned, hired, non-owned vehicles, and/or trailers and other equipment required to be licensed, covering personal injury, bodily injury and property damage.

ii. Limits:

Combined Single Limit	\$1,000,000.00
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(D) **Umbrella:**

i. Limits:

Each Occurrence/Aggregate	\$5,000,000.00
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(E) The Village, its officers, officials, employees, agents and volunteers shall be named as additional insureds on all insurance policies set forth herein except Workers' Compensation. The Contractor shall be responsible for the payment of any deductibles for

said insurance policies. The coverage shall contain no special limitations on the scope of protection afforded to the Village, its officers, officials, employees, agents, and volunteers.

(F) Contractor understands and agrees that any insurance protection required by this Contract or otherwise provided by Contractor, shall in no way limit the responsibility to indemnify, keep and save harmless, and defend the Village, its officers, officials, employees, agents and volunteers as herein provided.

**11. GUARANTY**

Contractor warrants and guarantees that its Work provided for the Project to be performed under this Contract, and all workmanship, materials, equipment, and supplies performed, furnished, used, or installed under this Contract, performed, furnished, used, or installed under this Contract, shall be free from defects and flaws in workmanship or design; shall strictly conform to the requirements of this Contract; and shall be fit and sufficient for the purposes expressed in, or reasonably inferred from, this Contract. Contractor further warrants and guarantees that the strength of all parts of all manufactured materials, equipment, and supplies shall be adequate and as specified and that the performance requirements of this Contract shall be fulfilled.

Contractor shall, at no expense to the Village, correct any failure to fulfill the above guaranty that may appear at any time. In any event, the guaranty herein expressed shall not be sole and exclusive, and is additional to any other guaranty or warranty expressed or implied.

**12. AFFIDAVIT OR CERTIFICATE**

Contractor shall furnish any affidavit or certificate in connection with the work covered by this Contract as required by law.

**13. NOTICES**

Any notice required to be given by this Contract shall be deemed sufficient if made in writing and sent by certified mail, return receipt requested, by personal service, or by email or facsimile transmission to the persons and addresses indicated below or to such addresses and persons as either party hereto shall notify the other party of in writing pursuant to the provisions of this Section:

**To the Village:**  
Village Manager  
Village of Oak Park  
123 Madison St.  
Oak Park, Illinois 60302-4272  
708-358-5770  
Email: [villagemanager@oak-park.us](mailto:villagemanager@oak-park.us)

**To Contractor:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Mailing of such notice as and when above provided shall be equivalent to personal notice and shall be deemed to have been given at the time of mailing. Notice by email transmission shall be effective as of date and time of transmission, provided that the notice transmitted shall be sent on business days during business hours (9:00 a.m. to 5:00 p.m. Chicago time). In the event email notice is transmitted during non-business hours, the effective date and time of notice is the first hour of the first business day after transmission.

**14. AUTHORITY TO EXECUTE**

The individuals executing this Contract on behalf of Contractor and the Village represent that they have the legal power, right, and actual authority to bind their respective parties to the terms and conditions of this Contract.

**15. EFFECTIVE DATE**

The effective date of this Contract as reflected above and below shall be the date that the Village Manager executes this Contract on behalf of the Village.

**16. ENTIRE CONTRACT; APPROVAL OF SUBCONTRACTORS**

This Contract, including the documents incorporated by reference herein, sets forth the entire Contract between the parties with respect to the accomplishment of the Work. No right or interest in this Contract shall be assigned, in whole or in part, by either party without the prior written consent of the other party. The Village reserves the right to approve the use of subcontractors to complete any portion of the Work and to approve any applicable contract between the Contractor and a proposed subcontractor to perform any of the Work. This Contract shall be binding upon the parties and upon their respective heirs, executors, administrators, personal representatives, successors, and assigns, except as herein provided.

**17. INDEPENDENT CONTRACTOR**

Contractor shall have the full control of the ways and means of performing the Work referred to above and that the Contractor and its employees, representatives or subcontractors are not employees of the Village, it being specifically agreed that the Contractor bears the relationship of an independent contractor to the Village. The Contractor shall solely be responsible for the payment of all salaries, benefits and costs of supplying personnel for the Work.

**18. CONTRACT BOND**

Before commencing the work on the Project, Contractor shall furnish a Contract Bond.

The Contract Bond shall be in an amount of \$25,000.00 as security for the faithful performance of its obligations pursuant to the Contract Documents and as security for the payment of all persons performing labor and furnishing materials in connection with the Contract Documents. Such bond shall be on a standard AIA document, shall be issued by a surety satisfactory to the Village, and shall name the Village as a primary co-obligee. The Contract Bond shall become a part of the Contract Documents. The failure of Contractor to supply the required Contract Bond within ten (10) days after the Notice of Award or within such extended period as the Village may grant if the Contract Bond does not meet its approval shall constitute a default, and the Village may either award the Contract to the next lowest qualified bidder or re-advertise for bids. A charge against Contractor may be made for the difference between the amount of Contractor's Bid and the amount for which a contract for the Work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the bid guarantee.

**19. GOVERNING LAW AND VENUE**

This Contract shall be governed by the laws of the State of Illinois both as to interpretation and performance. Venue for any action pursuant to this Contract shall be in the Circuit Court of Cook County, Illinois.

**20. AMENDMENTS AND MODIFICATIONS**

This Contract may be modified or amended from time-to-time provided, however, that no such amendment or modification shall be effective unless reduced to writing and duly authorized and signed by the authorized representative of the Village and the authorized representative of the Contractor.

**21. NON-WAIVER OF RIGHTS**

No failure of either party to exercise any power given to it hereunder or to insist upon strict compliance by the other party with its obligations hereunder, and no custom or practice of the parties at variance with the terms hereof, nor any payment under this Contract shall constitute a waiver of either party's right to demand exact compliance with the terms hereof.

**22. CONFLICT**

In case of a conflict between any provision(s) of the Village's Request for Bids or the Contractor's Bid and this Contract, this Contract and the Village's Request for Bids shall control to the extent of such conflict.

**23. HEADINGS AND TITLES**

The headings and titles provided in this Contract are for convenience only and shall not be deemed a part of this Contract.

**24. COOPERATION OF THE PARTIES**

The Village and Contractor shall cooperate in the provision of the Work to be provided by Contractor pursuant to this Contract and in compliance with applicable laws, including, but not limited to, the Illinois Freedom of Information Act, 5 ILCS 140/1 *et seq.* ("FOIA"), and the provision of any documents and information pursuant to a FOIA request. Contractor shall provide any and all responsive documents to the Village pursuant to a FOIA request at no cost to the Village.

**25. COUNTERPARTS; FACSIMILE OR PDF SIGNATURES**

This Contract may be executed in counterparts, each of which shall be considered an original and together shall be one and the same Contract. A facsimile or pdf copy of this Agreement and any signature(s) thereon will be considered for all purposes as an original.

**26. CERTIFIED PAYROLL**

Contractor shall be solely responsible to maintain accurate records reflecting its payroll for its employees who perform any of the Work for the Village pursuant to this Contract and shall submit certified payroll records to the Village's Director of Public Works or the Superintendent of Parks & Planning for the Park District at any time during the term of this Contract. Contractor shall provide said certified payroll records within seven (7) days upon the request of the Director of Public Works.

**27. LIVING WAGE/MINIMUM WAGE**

The Contractor shall comply with the Village's living wage requirements as set forth in Section 2-6-20 ("Living Wage") of the Oak Park Village Code, as amended. The Contractor shall further comply with the Cook County Minimum Wage Ordinance, codified as Sections 42-7 through 42-19 of the Cook County Code, as amended, and the minimum wage requirements of the State of Illinois set forth in 820 ILCS 105/4, as amended. The Contractor shall pay its employees the greater of the Village's living wage, the minimum wage set forth in the Cook County Minimum Wage Ordinance or the minimum wage set forth in 820 ILCS 150/4 as applicable during the term of this Contract. The Contractor shall provide any and all certified payroll records pursuant to Section 26 of this Contract above in order to determine whether the Contractor is meeting said requirement.

**28. EQUAL OPPORTUNITY EMPLOYER**

Contractor is an equal opportunity employer and the requirements of 44 Ill. Adm. Code 750 APPENDIX A and Chapter 13 (“Human Rights”) of the Oak Park Village Code are incorporated herein by reference.

The Contractor shall not discriminate against any employee or applicant for employment because of race, sex, gender identity, gender expression, color, religion, ancestry, national origin, veteran status, sexual orientation, age, marital status, familial status, source of income, disability, housing status, military discharge status, or order of protection status or physical or mental disabilities that do not impair ability to work, and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization. The Contractor shall comply with all requirements of Chapter 13 (“Human Rights”) of the Oak Park Village Code.

In the event of the Contractor’s noncompliance with any provision of Chapter 13 (“Human Rights”) of the Oak Park Village Code, the Illinois Human Rights Act or any other applicable law, the Contractor may be declared non-responsible and therefore ineligible for future Agreements or subcontracts with the Village, and the Agreement may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation.

In all solicitations or advertisements for employees placed by it on its behalf, the Contractor shall state that all applicants will be afforded equal opportunity without discrimination because of race, sex, gender identity, gender expression, color, religion, ancestry, national origin, veteran status, sexual orientation, age, marital status, familial status, source of income, disability, housing status, military discharge status, or order of protection status or physical or mental disabilities that do not impair ability to work.

**29. STANDARD OF CARE**

The Contractor shall endeavor to perform the Services with the same skill and judgment which can be reasonably expected from similarly situated firms or entities.

The Contractor shall comply with all federal, state, and local statutes, regulations, rules, ordinances, judicial decisions, and administrative rulings applicable to its performance under this Agreement as applicable, including, but not limited to, Cook County’s minimum wage and sick leave ordinances, respectively Cook County Ordinance Number 16-5768 and Cook County Ordinance Number 16-4229, and the Village’s Living Wage Ordinance, Village of Oak Park Ordinance Number 16-093, codified as Section 2-6-20 of the Village Code, all as amended.

The Contractor shall ensure that the Services are provided, performed, and completed in accordance with all applicable statutes, ordinances, rules, and regulations, including, but not limited to, the Fair Labor Standards Act; any statutes regarding qualification to do business; any statutes prohibiting discrimination because of, or requiring affirmative action based on race, color, religion, sex, national origin, ancestry, age, order of protection status, marital status, physical or mental disability, military status, sexual orientation, or unfavorable discharge from military service or other prohibited classification, including, without limitation, the Americans with Disabilities Act of 1990, 42 U.S.C. §§ 12101 *et seq.*, and the Illinois Human Rights Act, 775 ILCS 5/1-101 *et seq.* The Contractor shall also comply with all conditions of any federal, state, or local grant received by the Village or the Contractor with respect to this Agreement.

**[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK -  
SIGNATURE PAGE FOLLOWS]**

**IN WITNESS WHEREOF**, the parties hereto have caused this Contract to be signed by their duly authorized representatives on the dates set forth below.

**VILLAGE OF OAK PARK**

\_\_\_\_\_  
By: Kevin J. Jackson  
Its: Village Manager

Date: \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_\_  
By:  
Its:

Date: \_\_\_\_\_, \_\_\_\_\_

**ATTEST**

\_\_\_\_\_  
By: Christina M. Walters  
Its: Village Clerk

Date: \_\_\_\_\_, \_\_\_\_\_

**ATTEST**

\_\_\_\_\_  
By:  
Its:

Date: \_\_\_\_\_, \_\_\_\_\_

# Village of Oak Park Fire Department Oak Park North Fire Station 2 Mechanical Replacement Project



**STUDIO GC**  
architecture + interiors  
223 West Jackson Boulevard, Suite 1200  
Chicago, Illinois 60606  
(312) 253-3400

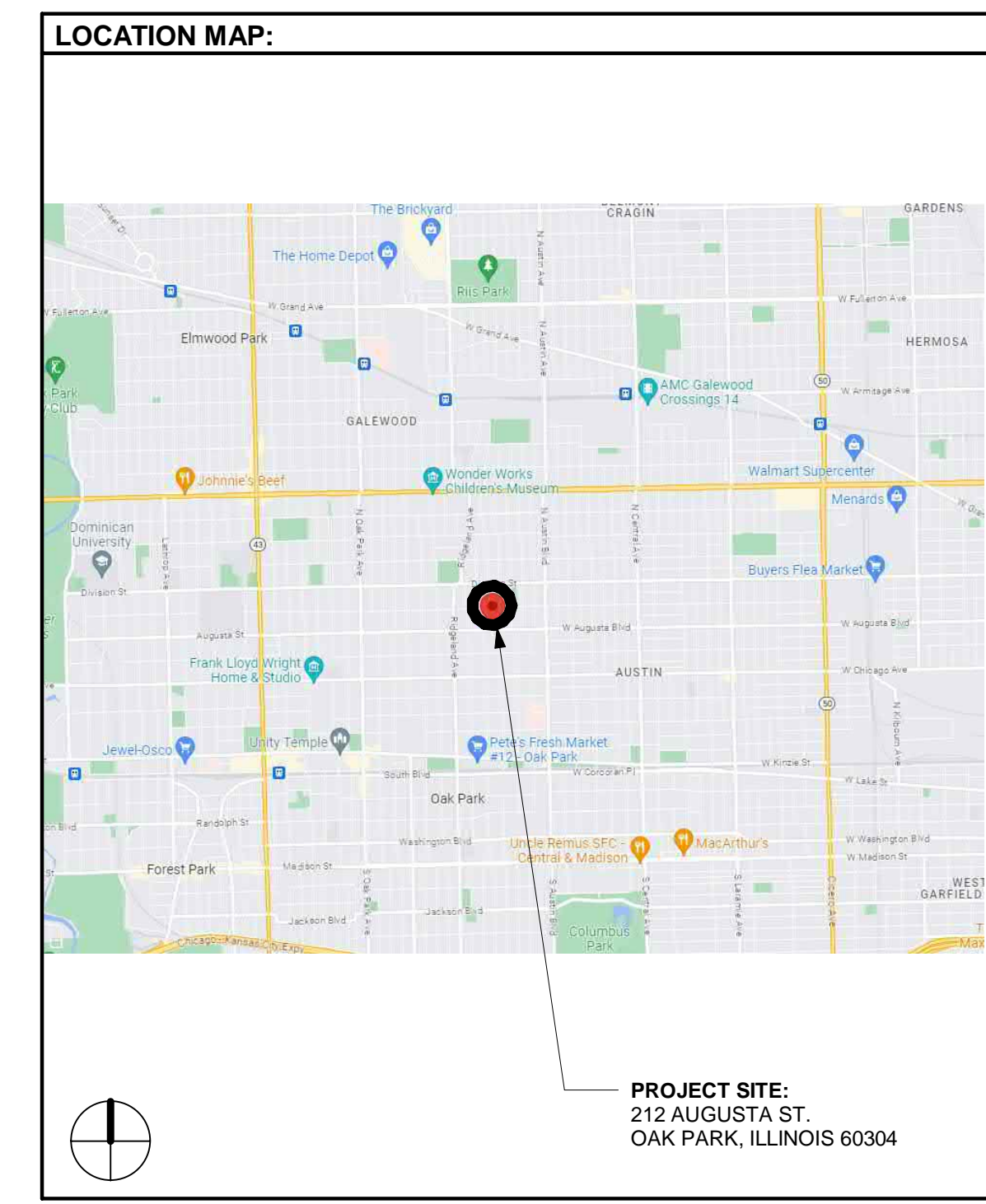
DRAWING INDEX	
SHEET NO.	SHEET NAME
T1.00	TITLE SHEET
G1.00	GENERAL NOTES
G1.02	CODE COMPLIANCE PLANS
A1.00	NEW WORK, DEMOLITIONS PLANS & DETAILS
ME1.00	MECH/ELEC. NOTES AND DETAILS
HVD1.00	HVAC DEMOLITION PLANS
HV1.00	HVAC PLANS
HV2.00	HVAC NOTES LEGEND, AND SPECIFICATIONS
HV2.10	HVAC DETAILS
HV3.00	HVAC SCHEDULES
ED1.00	ELECTRICAL DEMOLITION PLANS
E1.00	ELECTRICAL PLANS
E2.00	ELECTRICAL SCHEDULES
E2.10	ELECTRICAL SYMBOL LIST AND SPECIFICATIONS



CONSULTANTS:	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION ENGINEERS

BOARD	
VICKI SCAMAN	PRESIDENT
SUSAN BUCHANAN	TRUSTEE
CHIBUIKE ENYIA	TRUSTEE
RAVI PARAKKAT	TRUSTEE
LUCIA ROBINSON	TRUSTEE
BRIAN D. STRAW	TRUSTEE
CORY J. WESLEY	TRUSTEE
CHRISTINA WATERS	CLERK
RONALD KOBYLESKI	FIRE CHIEF
VIC SABALIAUSKAS	BUILDING MAINTENANCE SUPERINTENDENT

CERTIFICATION:	
I HEREBY CERTIFY THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED IN THE OFFICES OF STUDIO GC, INC. UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY KNOWLEDGE, COMPLY WITH THE FOLLOWING:	
<ul style="list-style-type: none"> <li>• 2021 INTERNATIONAL BUILDING CODE (IBC) W/AMENDMENTS</li> <li>• 2021 INTERNATIONAL EXISTING BUILDING CODE (IEBC)</li> <li>• 2020 NATIONAL ELECTRICAL CODE (NEC) W/AMENDMENTS</li> <li>• 2021 INTERNATIONAL FIRE CODE (IFC) W/AMENDMENTS</li> <li>• 2021 ILLINOIS ENERGY CONSERVATION CODE (IECC)</li> <li>• 2021 INTERNATIONAL MECHANICAL CODE (IMC) W/AMENDMENTS</li> <li>• 2021 INTERNATIONAL FUEL GAS CODE (IFGC)</li> <li>• 2018 ILLINOIS ACCESSIBILITY CODE (IAC)</li> <li>• 2014 ILLINOIS PLUMBING CODE (ILPC) NO/AMENDMENTS</li> </ul>	
	CRAIG S. MEADOWS ARCHITECT
001-021023	11/30/2024
LICENSE NO. AND EXPIRATION DATE	
FILL DATE	
DATE SIGNED	



North Fire Station #2 Mechanical  
Equipment Replacement

Village of Oak Park  
212 Augusta St., Oak Park, IL 60301

NO.	ISSUE	DATE
•	OUT FOR BID	• 04/03/2024
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•		•
•		•
•		•

TITLE SHEET

24036

T1.00

COPYRIGHT 2024, STUDIO GC, INC.

**GENERAL NOTES**

- 1.) REFER TO THE PROJECT MANUAL FOR BIDDING REQUIREMENTS, CONTRACT FORMS, GENERAL CONDITIONS OF THE CONTRACT, SUPPLEMENTARY CONDITIONS OF THE CONTRACT, AND TECHNICAL SPECIFICATIONS.
  - 2.) EACH CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE PROJECT SITE AND OBSERVING THE SURROUNDING CONDITIONS PRIOR TO SUBMITTING A BID FOR THIS PROJECT. CONTRACTORS SHALL PROMPTLY CONTACT THE ARCHITECT IN WRITING IF THERE IS A CONFLICT BETWEEN THE DRAWINGS AND EXISTING CONDITIONS, OR OTHER QUESTIONS ARISE FROM THE CONTRACTOR'S OBSERVATIONS.
  - 3.) SEVERAL ITEMS ON THE DRAWINGS ARE INDICATED AS AN ALTERNATE. THE SCOPE OF THESE ITEMS ARE EXPLAINED IN THE SECTION 012300 - ALTERNATES WITHIN THE PROJECT MANUAL.
  - 4.) ALL REQUIRED PRE-INSTALLATION MEETINGS AND MOCKUPS FOR CRITICAL WORK SHALL BE PERFORMED PRIOR TO COMMENCEMENT. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ADDITIONAL MEETINGS AND MOCKUPS WITH THE ARCHITECT AS THEY DEEM NECESSARY. SUCH WORK SHALL BE CONSIDERED PART OF THIS CONTRACT AND THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROVIDING SUCH WORK IN THEIR BID.
  - 5.) EACH CONTRACTOR SHALL COORDINATE THEIR WORK WITH ALL OTHER TRADES.
  - 6.) WHERE DISCREPANCIES EXIST BETWEEN THE DRAWINGS OF THE VARIOUS TRADES, PROMPTLY REPORT THE DISCREPANCIES TO THE ARCHITECT IN WRITING FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.
  - 7.) WHERE ANY PROVISIONS OF THE DRAWINGS AND SPECIFICATIONS CONFLICT WITH ONE ANOTHER, THE MORE STRINGENT OR COSTLY REQUIREMENT SHALL GOVERN UNLESS SPECIFICALLY DIRECTED OTHERWISE BY THE ARCHITECT.
  - 8.) EACH CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL FIELD CONDITIONS, MATERIALS, CONSTRUCTION METHODS AND DIMENSIONS PRIOR TO COMMENCING HIS WORK. CONTRACTORS SHALL PROMPTLY CONTACT THE ARCHITECT IN WRITING IF ISSUES OR QUESTIONS ARISE. COMMENCEMENT OF THE WORK BY A CONTRACTOR CONSTITUTES HIS ACCEPTANCE OF EXISTING CONDITIONS, AS WELL AS TAKING ON THE RESPONSIBILITY FOR ALL UNACCEPTABLE WORK CAUSED BY PREVIOUS CONDITIONS.
  - 9.) ANY MATERIALS ORDERED, FABRICATED, OR INSTALLED PRIOR TO THE ARCHITECT'S REVIEW AND APPROVAL OF REQUIRED SUBMITTALS, AND ASSOCIATED SUBMITTALS PERTAINING TO THE WORK, IS DONE SO AT EACH CONTRACTOR'S OWN RISK. THE OWNER AND ARCHITECT ASSUME NO RESPONSIBILITY FOR DELAYS OR ADDED COSTS INCURRED BY ANY CONTRACTOR AS A RESULT OF WORK INSTALLED OR COMPLETED WITHOUT PROPER SUBMITTAL REVIEW AND APPROVAL.
  - 10.) ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, NATIONAL CODES AND ORDINANCES AND ALL AUTHORITIES HAVING JURISDICTION. EACH CONTRACTOR IS RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL APPLICABLE CODES AND ORDINANCES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION PRIOR TO SUBMITTING BIDS FOR THIS PROJECTS. **PLEASE SEE TITLE PAGE FOR ALL LIST OF ADOPTED CODES.**
  - 11.) GENERAL CODE AND LIFE SAFETY INFORMATION FOR THIS PROJECT IS INDICATED ON THE G-SERIES SHEETS. INFORMATION PROVIDED IS NOT COMPREHENSIVE. CONTRACTORS SHALL BE RESPONSIBLE FOR PERFORMING WORK AS NOTED IN GENERAL NOTE 10.
  - 12.) DO NOT SCALE DRAWINGS. READ DIMENSIONS ONLY. IF A REQUIRED DIMENSION IS NOT INDICATED OR ANY DIMENSIONING DISCREPANCIES EXIST ON THE DRAWINGS THE CONTRACTOR SHALL PROMPTLY WRITE TO THE ARCHITECT FOR RESOLUTION.
  - 13.) CONTRACTORS SHALL NOT CUT STRUCTURAL ELEMENTS OR MEMBERS IN A MANNER RESULTING IN A REDUCTION OF LOAD CARRYING CAPACITY OR LOAD DEFLECTION RATIO.
  - 14.) ALL STRUCTURAL ITEMS, INCLUDING BUT NOT LIMITED TO, BEAMS, LINTELS, JOISTS, DECKS, MASONRY TIES, BOND BEAMS, COLUMNS, CONNECTIONS AND CONNECTORS, ETC., APPEARING ON ARCHITECTURAL DRAWINGS ARE ONLY SHOWN TO ILLUSTRATE RELATIONSHIPS TO OTHER BUILDING MATERIALS AND SYSTEMS AND SHALL BE CONSIDERED FOR INFORMATION ONLY. REFER TO STRUCTURAL DRAWINGS FOR DETAILED CONFIGURATIONS, TYPES, SIZES, CONNECTIONS, NOTES, AND SCHEDULES.
  - 15.) ALL COLD FORMED METAL FRAMING APPEARING ON ARCHITECTURAL DRAWINGS ARE SHOWN TO ILLUSTRATE INTENT. THE CONTRACTOR, AS PART OF DELEGATED DESIGN SUBMITTAL RESPONSIBILITY UNDER HIS SCOPE, IS TO PROVIDE CONNECTIONS, ACCESSORIES, AND CONFIGURATIONS REQUIRED TO MEET THE SPECIFICATIONS.
  - 16.) ALL PLUMBING, HVAC, ELECTRICAL, AND FIRE PROTECTION ITEMS APPEARING ON ARCHITECTURAL DRAWINGS ARE ONLY SHOWN TO ILLUSTRATE RELATIONSHIPS TO OTHER BUILDING MATERIALS AND SYSTEMS AND SHALL BE CONSIDERED FOR INFORMATION ONLY. REFER TO EACH DISCIPLINE DRAWINGS FOR DETAILED CONFIGURATIONS, TYPES, SIZES, CONNECTIONS, NOTES, AND SCHEDULES.
  - 17.) ALL PLUMBING, HVAC, ELECTRICAL AND FIRE PROTECTION ROUGH-IN WORK IN FINISHED AREAS SHALL BE CONCEALED IN AVAILABLE CEILING, WALL AND FLOOR SPACES.
  - 18.) ALL PIPE PENETRATIONS THROUGH THE NEW OR EXISTING SLAB ON GRADE, WALLS BELOW GRADE, AND EXTERIOR WALLS SHALL BE WATER SEALED. WHERE PENETRATIONS ARE REQUIRED TO BE FIRE SEALED PER THE CONTRACT DOCUMENTS, THE WATER SEAL SHALL BE IN ADDITION. THE FIRE SEALANT SHALL BE INSTALLED FIRST (DEPRESSED A MINIMUM OF 3/4 INCH) AND WITH THE WATER SEAL INSTALLED OVER THE TOP. AN APPROPRIATE BOND BREAKER SHALL BE INSTALLED IN BETWEEN THE TWO TYPES OF SEALANT.
- ALL DUCT PENETRATIONS THROUGH THE NEW OR EXISTING SLAB ON GRADE, WALLS BELOW GRADE, AND EXTERIOR WALLS SHALL BE FLASHED WITH A PREFABRICATED COLLAR AND WATER SEALED. WHERE PENETRATIONS ARE REQUIRED TO BE FIRE SEALED PER THE CONTRACT DOCUMENTS, THE WATER SEAL SHALL BE IN ADDITION. THE FIRE SEALANT SHALL BE INSTALLED FIRST (DEPRESSED A MINIMUM OF 3/4 INCH) AND WITH THE WATER SEAL INSTALLED OVER THE TOP. AN APPROPRIATE BOND BREAKER SHALL BE INSTALLED IN BETWEEN THE TWO TYPES OF SEALANT.
- 19.) ALL PIPE AND DUCT PENETRATIONS THROUGH THE NEW OR EXISTING ROOF DECK SHALL BE FLASHED WITH A PREFABRICATED BOOT/COLLAR AND WATER SEALED.
  - 20.) ROOF FLASHING DETAILS ARE GENERIC AND SHALL BE FINALIZED DURING SHOP DRAWING SUBMITTALS BASED ON THE ROOFING MANUFACTURER'S STANDARD DETAILS.

**GENERAL NOTES**

- 21.) PROVIDE GROUTED CELLS IN MASONRY WALLS TO ANCHOR ALL WALL MOUNTED ITEMS INCLUDING, BUT NOT LIMITED TO; MILLWORK, CASEWORK, WALL CABINETS, HANDRAILS, COAT RACKS, WALL HOOKS, DOOR STOPS, TOILET ACCESSORIES, OWNER FURNISHED EQUIPMENT, SHELVING, LIGHT FIXTURES, LIFE SAFETY EQUIPMENT AND OTHER SIMILAR ITEMS. THE AREA OF CELLS TO BE GROUTED SHOULD MATCH THE SIZE OF THE MOUNTED COMPONENT OR AT A MINIMUM HAVE GROUTED CELLS BEHIND EACH FASTENER POINT.
- 22.) PROVIDE FIRE TREATED WOOD OR STEEL FRAME BLOCKING, AS REQUIRED, IN FRAMED WALLS AND CEILINGS TO ANCHOR ALL WALL AND CEILING MOUNTED ITEMS INCLUDING, BUT NOT LIMITED TO; MILLWORK, CASEWORK, WALL CABINETS, HANDRAILS, COAT RACKS, WALL HOOKS, DOOR STOPS, TOILET ACCESSORIES, OWNER FURNISHED EQUIPMENT, SHELVING, LIGHT FIXTURES, LIFE SAFETY EQUIPMENT AND OTHER SIMILAR ITEMS.
- 23.) WOOD BLOCKING AND METAL FRAMING IS SHOWN GENERICALLY IN DETAILS TO ACHIEVE THE DESIRED OVERALL DESIGN INTENT, ITS RELATIONSHIP TO OTHER MATERIALS CAN BE ALTERED OR REPLACED AS REQUIRED BY APPROPRIATE CONSTRUCTION PRACTICES TO ACHIEVE THE FINAL APPEARANCE INDICATED ON THE DRAWINGS.
- 24.) THE PERIMETER OF ALL OPENINGS ARE TO BE BACKED AS NECESSARY AND SEALED, INTERIOR AND EXTERIOR.
- 25.) THE PERIMETER OF ALL PENETRATIONS ARE TO BE BACKED AS NECESSARY AND SEALED, INTERIOR AND EXTERIOR.
- 26.) ALL OPENINGS, INTERIOR AND EXTERIOR, THAT HAVE A RETURN FROM THE MAIN FACE, SHALL HAVE THE RETURN FINISHED THE SAME AS THE MAIN EXPOSED FACE U.N.O. THIS APPLIES TO BOTH SIDES OF ALL OPENINGS.
- 27.) CONTROL JOINTS IN GYPSUM BOARD ARE TO BE PROVIDED AS SHOWN. IN AREAS WHERE JOINTS ARE NOT SHOWN, THE CONTRACTOR SHALL PROVIDE JOINTS AS FOLLOWS: 1. AT EVERY 30 FEET IN WALLS OR CEILINGS. 2. AT ALL CORNERS OF AN L, U, OR T CONFIGURATION ON A WALL OR CEILING SURFACE. A CONTROL JOINT SHALL BE PROVIDED TO DIVIDE THE SECTIONS. THE CONTRACTOR IS TO REVIEW ALL LOCATIONS WITH THE ARCHITECT IN THE FIELD PRIOR TO COMMENCING CONTROL JOINT INSTALLATION REGARDLESS OF WHETHER JOINTS ARE SHOWN OR THE JOINTS ARE BEING PROVIDED PER THE GUIDELINES NOTED HERE.
- 27.) CONTROL JOINTS IN RATED ASSEMBLIES ARE TO BE TREATED AS NOT TO COMPROMISE THE RATED ASSEMBLY. CONTRACTORS SHALL PROVIDE APPROPRIATE BACKING MATERIAL AND FIRE STOPPING TO CLOSE THE CAVITY AND PROVIDE AN APPROPRIATELY RATED SEALANT.
- 28.) THE TYPICAL CONDITION, UNLESS DETAILED OTHERWISE, WHERE GYPSUM WALLBOARD MEETS ANY KIND OF DISSIMILAR SURFACE, INCLUDING BUT NOT LIMITED TO MASONRY, WOOD, OR METAL, IS TO HAVE WALLBOARD EDGE FINISHED WITH A PAINTED J-BEAD EDGE AND DRYWALL COMPOUND AND THE JOINT CAULKED.
- 29.) WHENEVER MASONRY REQUIRES CUTTING TO ENCLOSE A STRUCTURAL MEMBER, PROVIDE MAXIMUM THICKNESS POSSIBLE AND STILL PREVENT CONTACT WITH THE STRUCTURE. EXCEPT FOR WALL TIES, USE THE SAME UNITS AS IN WALL SO FACE TEXTURE AND APPEARANCE IS UNIFORM.
- 30.) CONTRACTORS SHALL FINISH DESIGNING AND FABRICATE ITEMS DESIGNATED AS A 'DELEGATED DESIGN' WITHIN THE SPECIFICATIONS. COORDINATE WITH INDIVIDUAL SPECIFICATION SECTIONS FOR THESE ITEMS.
- 31.) CONTRACTORS SHALL CAREFULLY COORDINATE ALL WORK WITH EQUIPMENT BEING FURNISHED BY THE OWNER AND INSTALLED BY THE CONTRACTORS. ALL SHOP DRAWINGS AND OTHER SUBMITTALS SHALL BE CAREFULLY COORDINATED ACCORDINGLY. CONTRACTORS SHALL PROVIDE FOR SOME ADJUSTMENT IN FINAL DESIGN AND FABRICATION TO ACCOMMODATE INSTALLATION OF EQUIPMENT.
- 32.) CONTRACTORS SHALL COORDINATE TESTING WITH OWNER'S PROVIDED TESTING SERVICE. CONTRACTOR SHALL PROVIDE TESTING SERVICES AS PART OF THEIR BID FOR THOSE TESTS SPECIFICALLY NOTED AS CONTRACTOR'S RESPONSIBILITY WITHIN THE INDIVIDUAL SPECIFICATIONS SECTIONS.

**PROJECT NOTES**

- 1.) CONTRACTORS SHALL PROVIDE TEMPORARY BARRIERS AND CONTROLS IN THE PROXIMITY OF THE SITE THROUGHOUT THE WORK DAY. CONTRACTORS SHALL COORDINATE WITH THE LOCAL MUNICIPALITY AND OWNER TO LIMIT DISRUPTION AND TO PROTECT LOCAL TRAFFIC AND RESIDENTS DURING THE COURSE OF THE WORK.
- 2.) BEFORE BEGINNING WORK AT THE SITE AND THROUGHOUT THE COURSE OF THE WORK, INSPECT AND VERIFY THE EXISTING CONDITIONS, MATERIALS, DIMENSIONS, LOCATIONS AND CONDITIONS OF EVERY ITEM AFFECTED BY THE WORK UNDER THIS CONTRACT AND REPORT DISCREPANCIES IMMEDIATELY TO THE ARCHITECT IN WRITING FOR RESOLUTION BEFORE BEGINNING THE WORK RELATED TO THAT BEING INSPECTED.
- 3.) BEFORE BEGINNING WORK AT THE SITE, INSPECT THE EXISTING BUILDING AND DETERMINE THE EXTENT OF EXISTING CONSTRUCTION, BUILDING SYSTEMS, FINISHES, SPECIALTIES, EQUIPMENT, FURNITURE AND OTHER ITEMS WHICH MUST BE REMOVED AND REINSTALLED IN ORDER TO PERFORM THE WORK UNDER THIS CONTRACT.
- 4.) THE DRAWINGS SHOW PRINCIPLE AREAS WHERE WORK MUST BE ACCOMPLISHED UNDER THIS CONTRACT. INCIDENTAL WORK MAY ALSO BE NECESSARY IN AREAS NOT SHOWN ON THE CONTRACT DRAWINGS AS REQUIRED TO THE PRINCIPAL WORK DELINEATED WITHIN THIS SET. SUCH INCIDENTAL WORK SHALL BE DONE PER THE CONTRACT DOCUMENT REQUIREMENTS AND ALL APPLICABLE CODES. **PLEASE SEE TITLE PAGE FOR LIST OF ADOPTED CODES.** SUCH WORK SHALL BE CONSIDERED PART OF THIS CONTRACT AND THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROVIDING SUCH WORK IN THEIR BID.
- 5.) CONTRACTORS SHALL PROVIDE NEW UNDATED MATERIALS. ANY DAMAGED MATERIALS, FIXTURES AND/OR FINISHES RECEIVED ARE NOT TO BE INSTALLED AND RETURNED TO THE MANUFACTURER/DISTRIBUTOR. INSTALLATION OF DAMAGED MATERIALS WILL BE REJECTED.
- 6.) PROTECT ALL EXISTING CONSTRUCTION, INFRASTRUCTURE, EQUIPMENT AND FURNISHINGS TO REMAIN FROM DAMAGE. VIDEOTAPE/ PHOTOGRAPH EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF WORK. TRADE CONTRACTORS WILL REPAIR/ REPLACE OR CORRECT ANY AND ALL EXISTING CONSTRUCTION, TO MATCH THAT DAMAGED BY CONSTRUCTION AND/OR INSTALLATION PROCESS UNDER THIS CONTRACT AS NECESSARY AT NO ADDITIONAL EXPENSE TO OWNER.
- 7.) REPAIR, PATCH AND REFINISH, OR REPLACE, ANY EXISTING CONSTRUCTION AND INFRASTRUCTURE THAT IS DISTURBED OR DAMAGED DURING THE COURSE OF THE WORK. SUCH REPAIR OR REPLACEMENT WORK IS TO MATCH EXISTING CONSTRUCTION IN QUALITY, CHARACTER AND FINISH.
- 8.) WHERE MATCH EXISTING IS INDICATED OR NEEDED, THE NEW CONSTRUCTION, INFRASTRUCTURE OR FINISHES REQUIRED TO COMPLETE THE WORK SHALL MATCH THE EXISTING IN SHAPE, CONFIGURATION, CHARACTERISTIC AND PROPERTY.
- 9.) CONTRACTORS SHALL USE EXISTING INFRASTRUCTURE TO COMPLETE BUILDING SYSTEM INSTALLATION AS MUCH AS POSSIBLE.
- 10.) SHOULD DISCREPANCIES APPEAR AMONG THE CONTRACT DOCUMENTS OR BETWEEN THE CONTRACT DOCUMENTS AND EXISTING SITE CONDITIONS, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION FROM THE ARCHITECT BEFORE THE BIDDING PERIOD IS COMPLETE. IF THE CONTRACTORS FAIL TO MAKE SUCH REQUESTS, IT IS PRESUMED THAT BOTH PROVISIONS WERE INCLUDED IN THE BID, AND THE ARCHITECT SHALL DETERMINE WHICH OF THE CONFLICTING REQUIREMENTS SHALL GOVERN. THE CONTRACTORS SHALL PERFORM THE WORK AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH THE ARCHITECT'S DETERMINATION.
- 11.) WHERE CONFLICT EXISTS BETWEEN, OR WITHIN, THE CONTRACT DOCUMENTS, BETWEEN THE CONTRACT DOCUMENTS AND APPLICABLE STANDARDS, CODES, ORDINANCES, OR MANUFACTURERS' RECOMMENDATIONS, AND CLARIFICATION HAS NOT BEEN REQUESTED FROM THE ARCHITECT PRIOR TO THE CLOSE OF BIDDING AS PROVIDED FOR ABOVE (NOTE 10), THE MORE STRINGENT OR HIGHER QUALITY STANDARD SHALL PREVAIL. LARGE SCALE DRAWINGS SHALL TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS, FIGURED DIMENSIONS ON THE DRAWINGS OVER SCALED DIMENSIONS, AND NOTED MATERIAL OVER GRAPHIC REPRESENTATIONS.
- 12.) THE CONTRACTORS SHALL PROVIDE ALL WORK AND MATERIALS WHICH ANY SECTION OR PART OF THE DRAWINGS, SPECIFICATIONS, OR CONDITIONS REQUIRE HIM TO PROVIDE FOR ALL SIMILAR WORK. THIS SHALL APPLY TO ALL SIMILAR WORK REGARDLESS OF WHETHER SUCH REQUIREMENT IS OR IS NOT FAITHFULLY REPEATED IN OTHER PARTS OF THE CONTRACT DOCUMENTS, THEREOF TO WHICH, THE PROVISIONS MIGHT BE APPROPRIATE.
- 13.) PERFORM WORK SO AS NOT TO ADVERSELY AFFECT THE PERFORMANCE OR OPERATION OF THE BUILDING OR CAUSE THE EXISTING STRUCTURE TO BECOME UNSAFE OR CAUSE AN INCREASE IN REQUIRED OWNER MAINTENANCE TO THE EXISTING BUILDING SYSTEMS TO REMAIN.
- 14.) PERFORM WORK TO MAINTAIN WEATHER TIGHT CONSTRUCTION OF THE EXISTING BUILDING AT ALL TIMES.
- 15.) CONFINE OPERATIONS TO AREAS WITHIN CONTRACT LIMITS INDICATED AND AS SPECIFICALLY ALLOWED BY THE OWNER PER WRITTEN APPROVAL. AREAS OF THE SITE BEYOND THE LIMITS OF THE CONTRACT OPERATIONS ARE NOT TO BE DISTURBED. CONTRACTORS SHALL BE RESPONSIBLE FOR REPAIR AND RESTORATION OF ANY EXISTING SITE CONSTRUCTION DAMAGED OUTSIDE OF THE CONTRACT LIMITS.
- 16.) KEEP CONSTRUCTION ENTRANCES AND LOCAL ACCESS ROAD SERVING THE SITE CLEAN AND CLEAR AT ALL TIMES. SCHEDULE DELIVERIES TO MINIMIZE SPACE AND TIME REQUIRED FOR STORAGE OF MATERIALS ON SITE.
- 17.) CONTRACTORS ARE RESPONSIBLE FOR THEIR OWN CLEANUP AT THE END OF EACH WORK DAY THROUGHOUT THE COURSE OF THE PROJECT.
- 18.) CONTRACTORS SHALL PROVIDE A FINAL CLEANUP AT THE END OF THE PROJECT PRIOR TO FINAL COMPLETION. ALL SURFACES, FIXTURES AND COMPONENTS ARE TO BE CLEANED THOROUGHLY SO NO MARKS, RESIDUE, STICKERS, OR RUBBISH REMAINS. ANY ITEM THAT CAN NOT BE EFFECTIVELY CLEANED SHALL BE REPLACED.
- 19.) OWNER SHALL PAY FOR THE BUILDING PERMIT PERTAINING TO THE PROJECT. CONTRACTORS SHALL BE RESPONSIBLE FOR SCHEDULING REQUIRED INSPECTIONS, AND SUBMITTING REQUIRED RECORDS, FORMS AND SUBMITTALS TO THE LOCAL AUTHORITY HAVING JURISDICTION. CONTRACTORS SHALL BE RESPONSIBLE FOR LICENSE FEES AND PERMITS RELATED TO OPERATING AND WORKING WITHIN THE MUNICIPALITY.

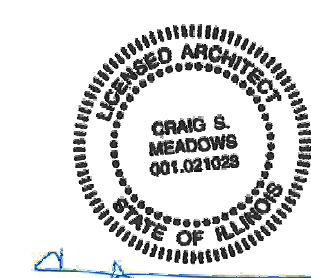
**PROJECT NOTES**

- 20.) WORK SHOWN IS NEW UNLESS SPECIFICALLY NOTED OR OTHERWISE INDICATED.
- 21.) DO NOT SCALE DRAWINGS, DIMENSIONS SHALL GOVERN. LARGE SCALE DETAILS SHALL GOVERN OVER SMALL SCALE DETAILS. IF A REQUIRED DIMENSION IS NOT INDICATED OR ANY DIMENSIONING DISCREPANCIES EXIST ON THE DRAWINGS THE CONTRACTORS SHALL PROMPTLY WRITE TO THE ARCHITECT FOR RESOLUTION.
- 22.) VERIFY ALL DIMENSIONS IN FIELD PRIOR TO SHOP FABRICATION OF ITEMS.
- 23.) DETERMINE THE LOCATION OF PARTITIONS NOT DIMENSIONED BY THEIR RELATION TO COLUMN FACE OR CENTER, OPENING JAMB OR MULLION, EXISTING WALLS OR OTHER SIMILAR FIXED ITEMS.
- 24.) ALL HOLD DIMENSIONS ARE REQUIRED TO BE EXACT WITH 1/8" TOLERANCE ALONG FULL HEIGHT AND FULL WIDTH OF WALL, PARTITION OR BUILDING COMPONENT.
- 25.) AT LOCATIONS WHERE PERMANENT REMOVAL OF EXISTING MILLWORK, CASEWORK, DOORS AND FRAMES, ACCESSORIES, EQUIPMENT OR FURNISHINGS CAUSES PREVIOUSLY CONCEALED SURFACES TO REMAIN EXPOSED, PATCH SUCH SURFACES TO MATCH ADJACENT EXPOSED WORK. WHERE THE ADJACENT EXPOSED WORK SURFACES ARE SCHEDULED TO RECEIVE NEW FINISHES, PREPARE THE PREVIOUSLY CONCEALED SURFACES TO RECEIVE THE NEW FINISHES.
- 26.) WHERE CUTTING OF EXISTING SURFACES OR REMOVAL OF EXISTING SURFACES IS REQUIRED TO PERFORM THE WORK UNDER THIS CONTRACT, AND NEW FINISH IS NOT INDICATED, FILL RESULTING OPENINGS AND PATCH THE SURFACE AFTER DOING THE WORK, AND FINISH TO MATCH ADJACENT EXISTING SURFACES.
- 27.) WHERE CONDUITS, DUCTS, AND SIMILAR ITEMS ARE SHOWN TO BE INSTALLED IN EXISTING WALLS OR PARTITIONS, NEATLY CHASE OR CUT THE WALLS OR PARTITIONS, INSTALL THE ITEMS, AND PATCH THE WALLS OR PARTITIONS TO MAKE THE INSTALLATION NOT DISCERNIBLE IN THE FINISH WORK.
- 28.) SEAL TIGHT AND PROTECT WITH FIRE SAFING AND CAULKING PER UL DETAILS, EXISTING AND NEW SLEEVES AND OPENINGS THROUGH FLOORS.
- 29.) REFER TO NEW WORK PLANS TO COORDINATE EXTENT OF DEMOLITION REQUIRED.
- 30.) WHERE NOT SPECIFICALLY NOTED, CONTRACTORS SHALL MODIFY EXISTING FLOORING AND CEILING CONSTRUCTION TO REMAIN AS REQUIRED TO ABUT NEW CONSTRUCTION AND MATCH ADJACENT EXISTING CONDITIONS (TYP.).
- 31.) VERIFY W/ OWNER ITEMS TO BE SALVAGED AND RETURNED TO OWNER. ALL ITEMS TO BE SALVAGED SHALL BE CAREFULLY REMOVED SO AS TO ALLOW FOR REUSE.
- 32.) PROVIDE WALL PREPARATION OF NEW AND EXISTING WALLS, PRIOR TO BEGINNING PAINTING WORK, INCLUDING BUT NOT LIMITED TO PATCHING HOLES, GOUGES, OR OTHER DAMAGE, SECURING LOOSE TRIM, CONDUITS AND ANY OTHER WALL OR CEILING HARDWARE ITEMS REQUIRING PAINTING.
- 33.) WALLS INDICATED TO BE PAINTED, OR REQUIRED TO BE REPAINTED DUE TO REPAIR OF DAMAGED/DISTURBED WORK SHALL HAVE THE ENTIRE WALL SURFACE FROM CORNER TO CORNER, OR OTHER NATURAL BREAK PAINTED.
- 34.) CONTRACTORS SHALL COORDINATE THE WORK WITH OWNER'S OTHER FORCES TO AVOID DELAYS IN THE WORK AND PROVIDE A COMPLETE INSTALLATION.
- 35.) CONTRACTORS ARE RESPONSIBLE FOR PROCURING TEMPORARY UTILITIES AND PAYING FOR SUCH UTILITIES UNTIL SUCH TIME THAT THE PERMANENT UTILITIES ARE OPERATIONAL AND THE OWNER HAS GRANTED, IN WRITING, THEIR USE BY THE CONTRACTORS.
- 36.) CONTRACTOR IS RESPONSIBLE FOR PREPARING AND SUBMITTING FULLY DESIGNED FIRE SPRINKLER AND FIRE ALARM DRAWINGS TO THE LOCAL AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL.
- 37.) IT IS MANDATORY THAT THE EXISTING BUILDING REMAIN IN CONTINUOUS AND NON-INTERRUPTED OPERATION DURING REMODELING/ALTERING OF SAID EXISTING BUILDING. ONLY THE SPECIFIC AREAS BEING REMODELED/ALTERED AT ANY SCHEDULED TIME ARE EXCLUDED. SERVICES TO EXISTING BUILDING SHALL BE KEPT IN CONTINUOUS OPERATION INCLUDING POWER, SIGNAL SYSTEMS, LIGHTING, TELEPHONE, HEATING, COOLING, VENTILATING, TEMPERATURE CONTROLS, SEWERS AND HOT AND COLD WATER. ANY ABSOLUTELY NECESSARY INTERRUPTION OF THESE SERVICES TO ACCOMPLISH CONTRACT WORK SHALL BE ARRANGED THROUGH THE ARCHITECT WITH THE OWNER A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE. SUCH INTERRUPTIONS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AS FAR AS TIME INTERVAL IS INVOLVED. TEMPORARY SERVICES SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT WHEN THE LENGTH OF THE DISRUPTION IS GREATER THAN ONE WORKING DAY. TEMPORARIES SHALL BE REMOVED BY THE CONTRACTOR ONLY AFTER NEW PERMANENT SERVICES ARE INSTALLED AND FULLY OPERATIONAL.
- 38.) "AS BUILT DRAWINGS" WILL BE DEVELOPED BY THE GENERAL CONTRACTOR DURING THE COURSE OF THIS PROJECT. A COPY OF SUCH WILL ALSO BE SUBMITTED TO THE VILLAGE OF OAK PARK FOR THE PERMANENT BUILDING PERMIT FILE.



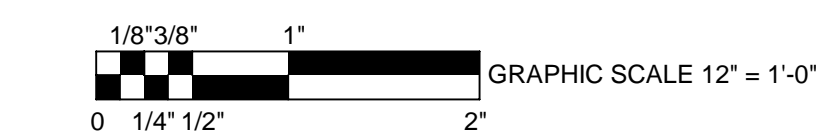
North Fire Station #2 Mechanical  
Equipment Replacement

Village of Oak Park  
212 Augusta St, Oak Park, IL 60301



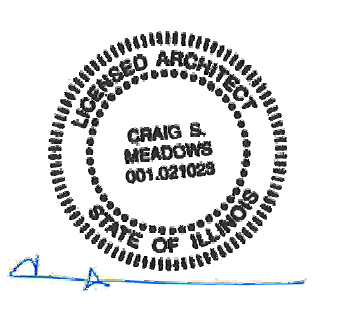
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**GENERAL NOTES**



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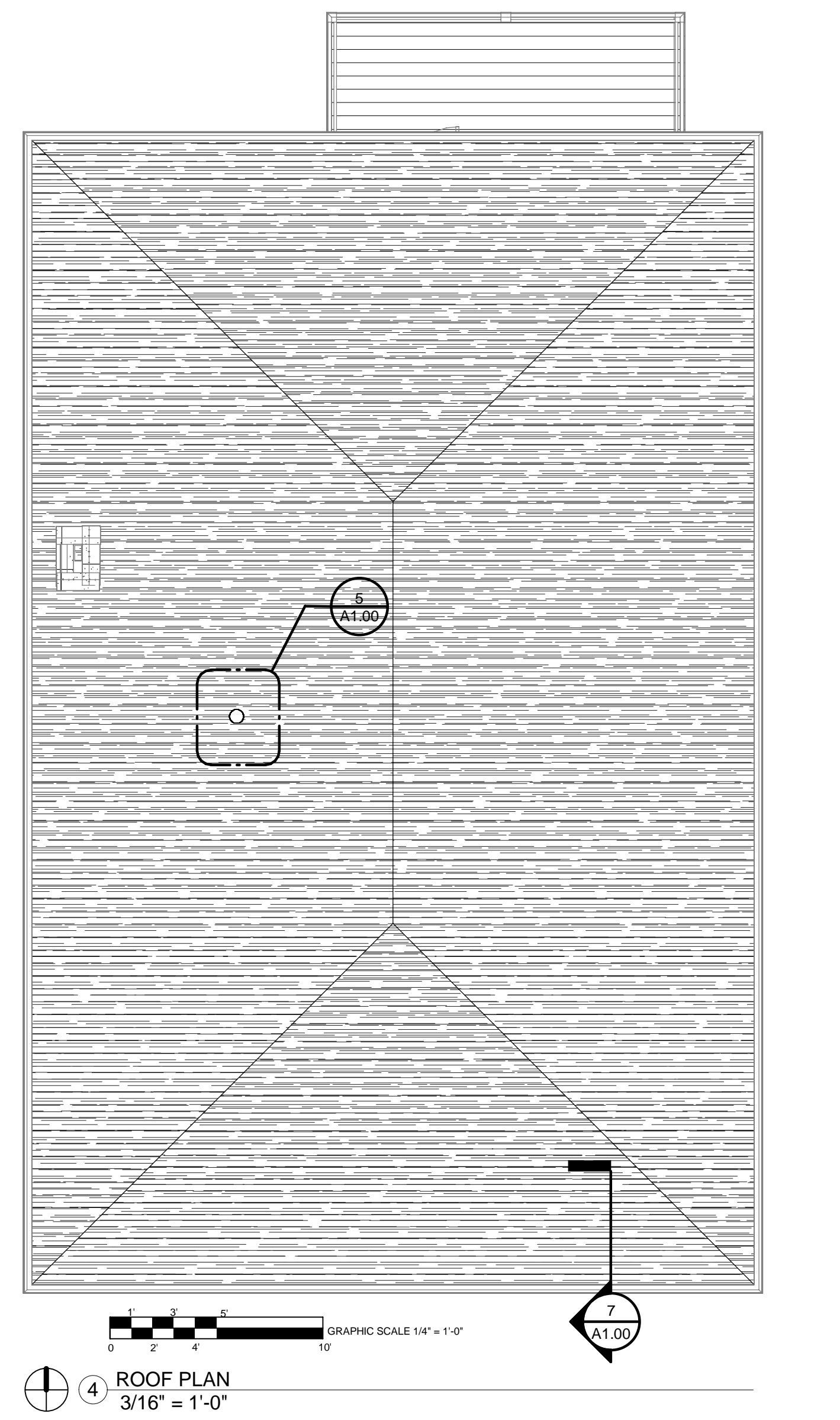
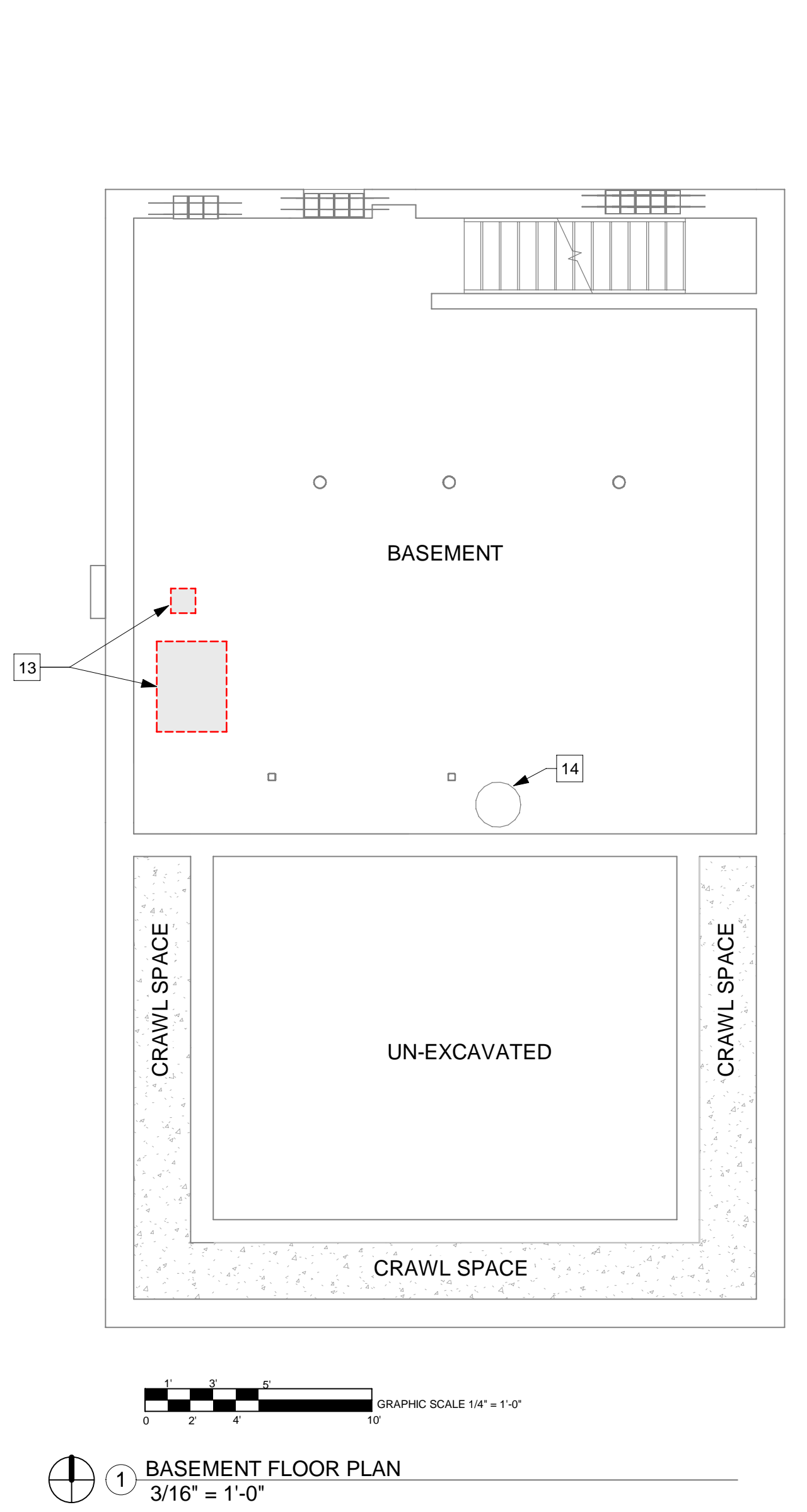
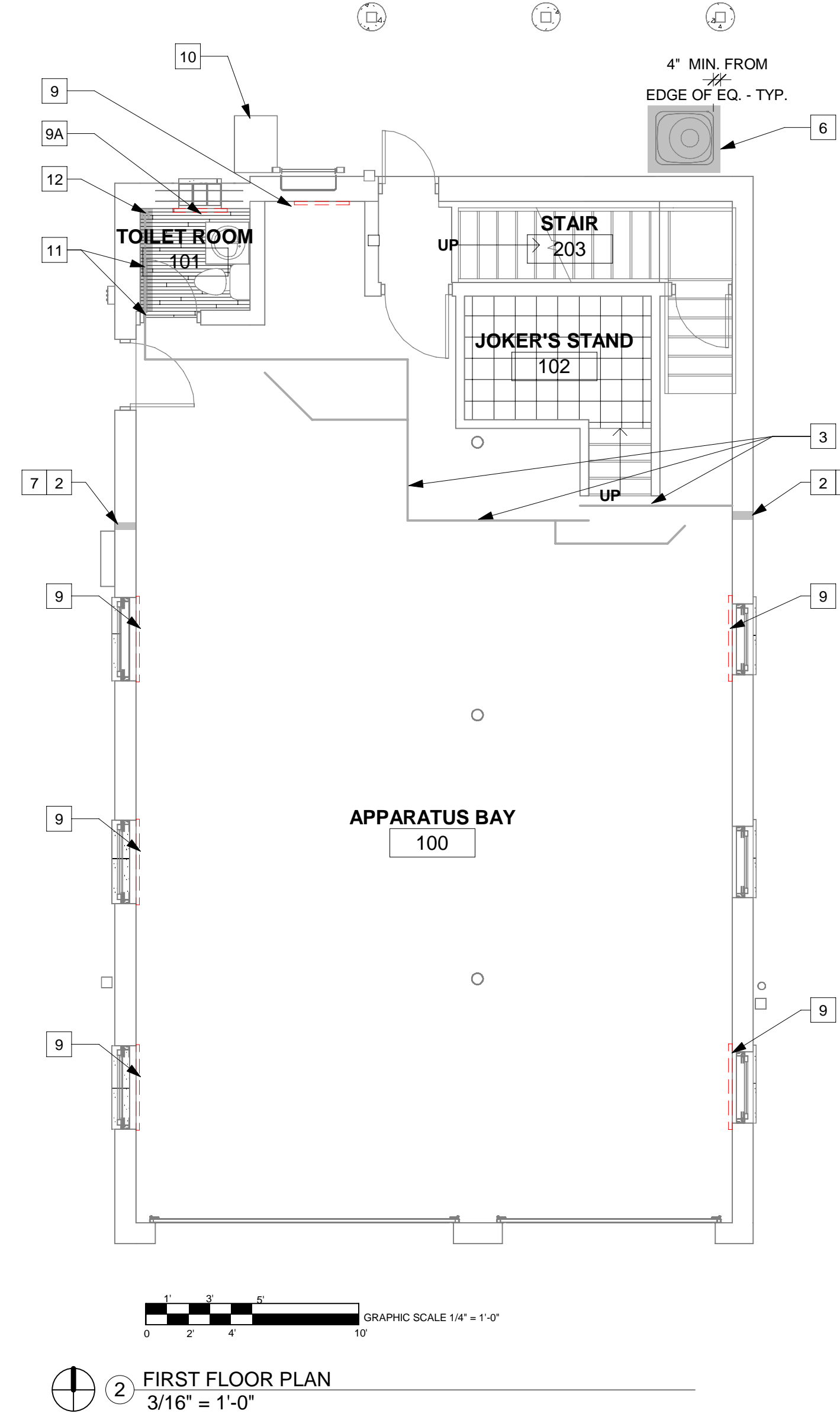
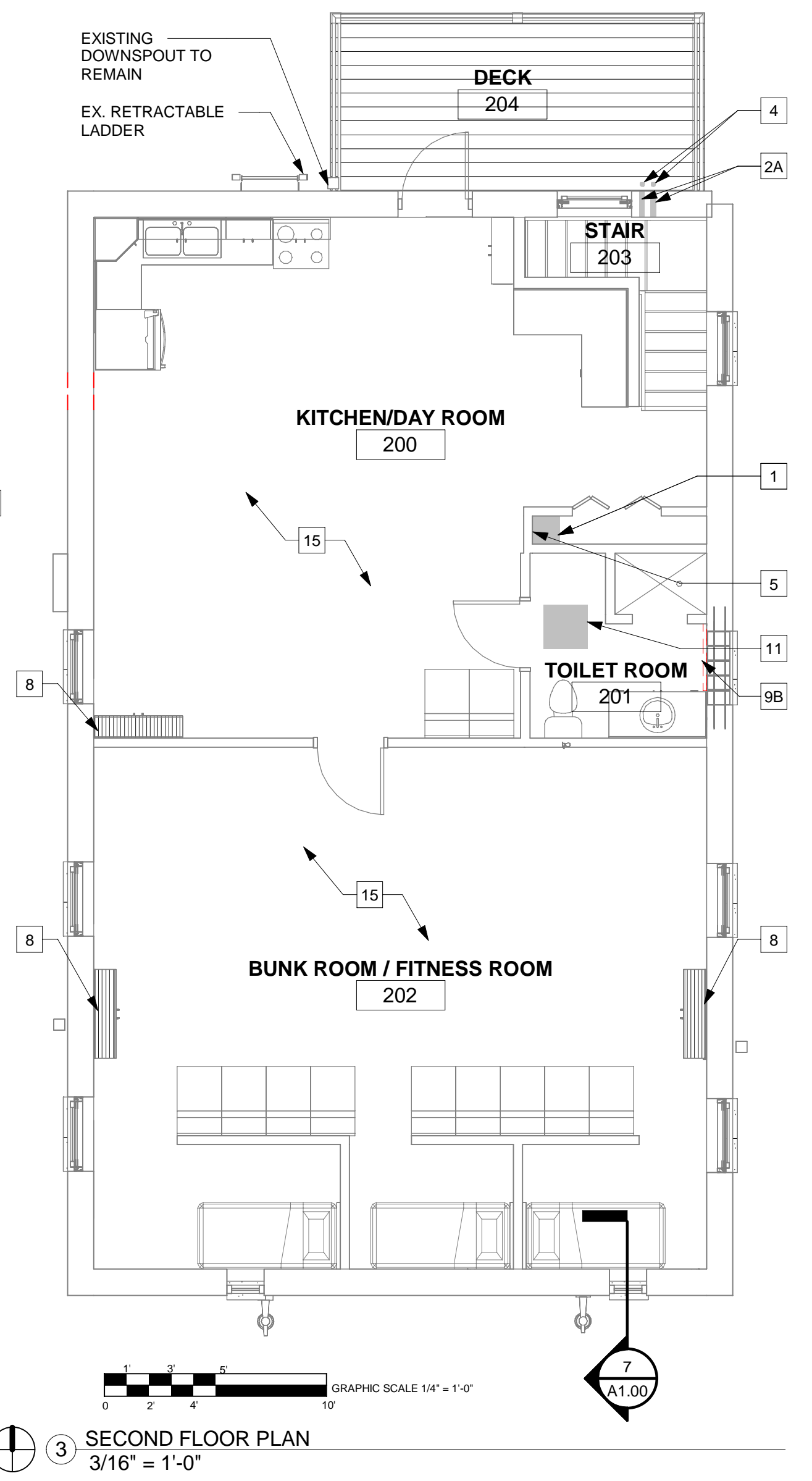
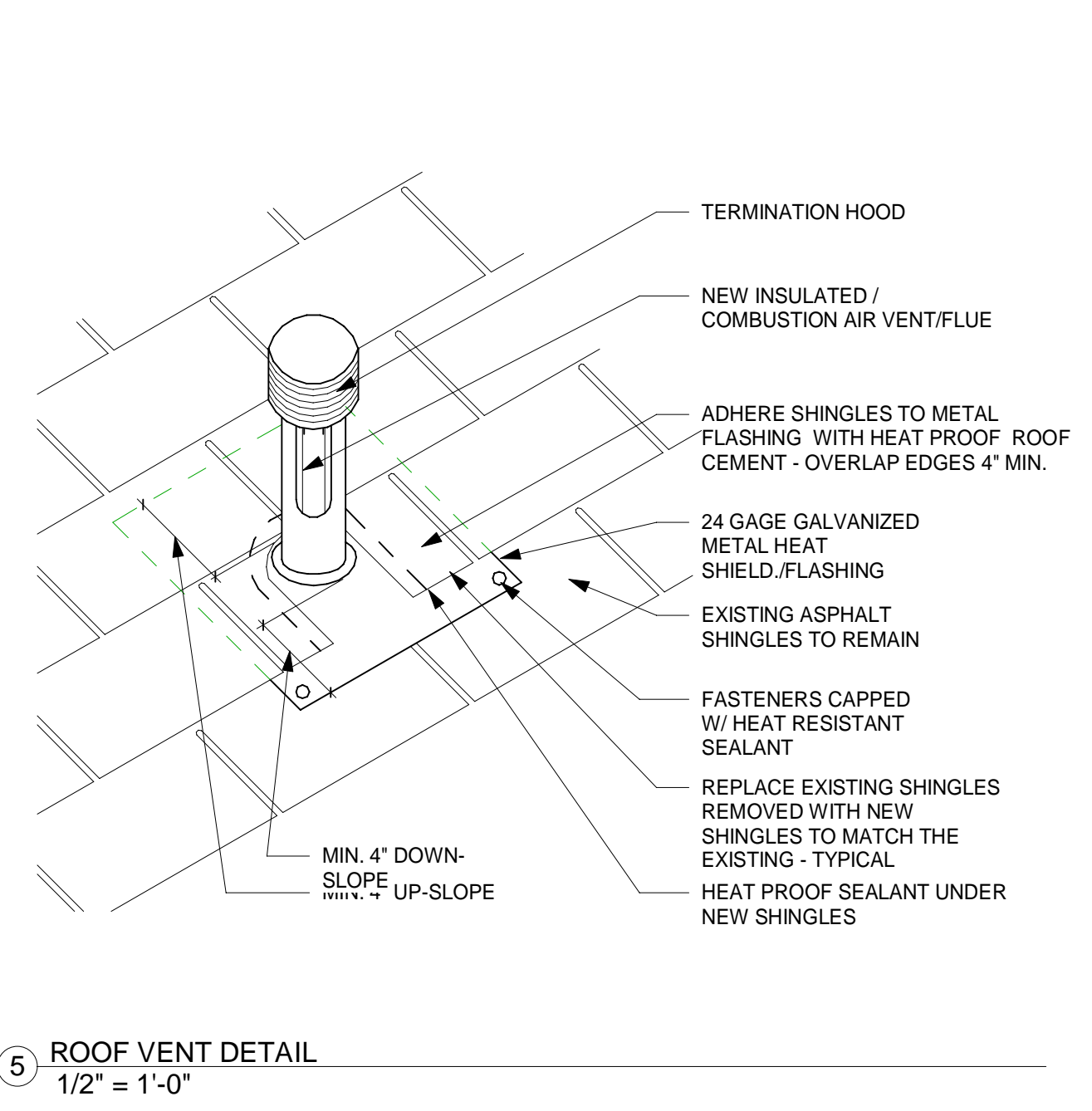
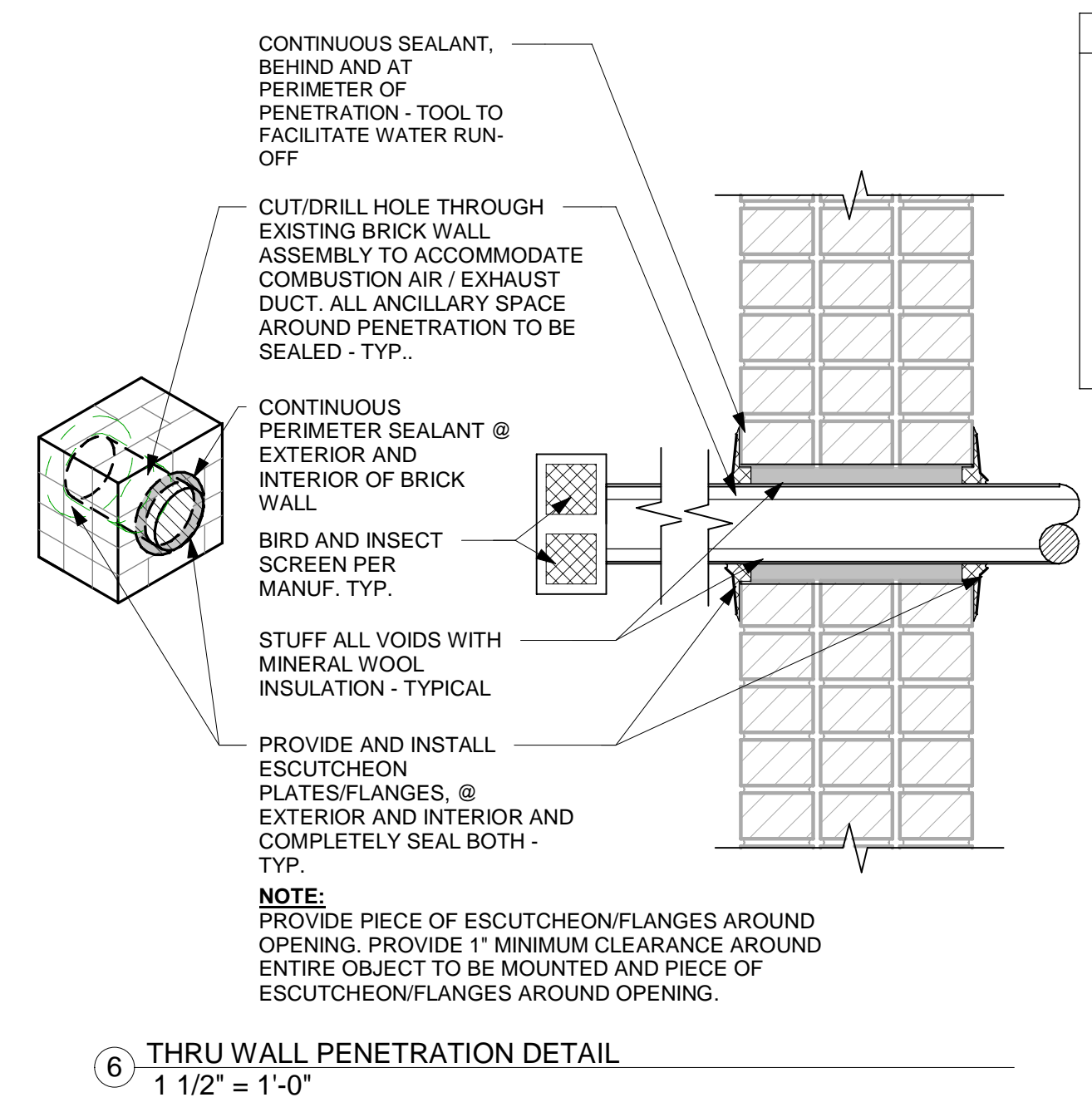
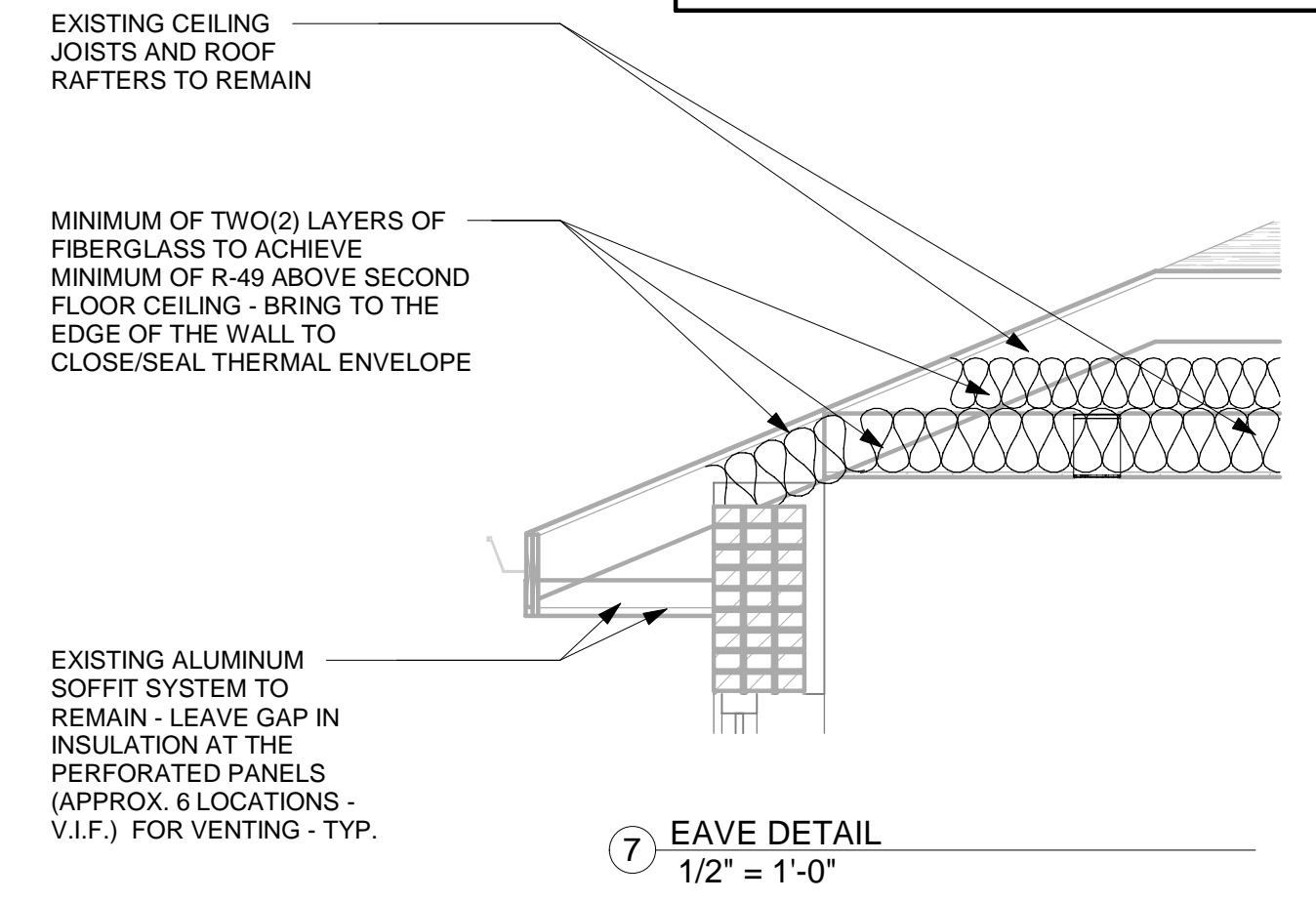
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**NEW WORK, DEMOLITIONS PLANS & DETAILS**

DEMOLITION & NEW WORK KEY NOTES - DENOTED	
1	REMOVE EXISTING GYP BD. CEILING AS REQUIRED TO INSTALL/RUN CONDENSATE LINE - PATCH AND REPAIR CEILING TO MATCH EXISTING CEILING AND PAINT TO LEVEL 4 FINISH - TYPICAL THIS AREA.
2	CORE THRU EXISTING THREE(3) WYTHE BRICK WALL TO FACILITATE INSTALLATION OF NEW CONDENSATE LINE, (MIN. 6" ABOVE GRADE) AND SEAL TO A WATER TIGHT CONDITION.
2A	UTILIZE RE-USE EXISTING CORES/HOLES IF POSSIBLE. OTHERWISE CORE THRU EXISTING THREE(3) WYTHE BRICK WALL TO FACILITATE INSTALLATION OF NEW CONDENSATE LINE, AND SEAL TO A WATER TIGHT CONDITION
3	ALL NEW CONDENSATE LINE, CONDUITS, GAS LINES ETC. AND BRACKETS ABOVE - PAINT TO MATCH EXISTING BEAD BOARD CEILING - COLOR TO BE SELECTED FROM MANUF. STANDARD LINE OF COLORS - TYP.
4	REMOVE EXISTING REFRIGERANT LINES AND REPLACE WITH NEW REFRIGERANT LINES UP THE WALL, IN SIMILAR LOCATION. UTILIZE MANUFACTURER'S RECOMMENDED BRACKETS AND ANCHORS - TYP.
5	REMOVE EXISTING GYP BD. WALL AND CEILING AS REQUIRED TO INSTALL/RUN CONDENSATE LINE WITHIN AND DOWN AND WITHIN THE WALL - PATCH AND REPAIR THE WALL AND CEILING TO MATCH EXISTING CEILING AND PAINT TO LEVEL 4 FINISH - TYPICAL THIS AREA.
6	REMOVE EXISTING CONCRETE PAD AND REPLACE WITH NEW 8" THICK CONCRETE PAD, 4" ABOVE GRADE AND 4" BELOW ON 8" COMPACTED BED OF CA6 GRAVEL. EXTEND EDGES OF PAD TO BE 4" FROM THE EDGE OF THE NEW CONDENSING UNIT. VERIFY WITH SIZE OF NEW UNIT.
7	PROVIDE AND INSTALL FLASHING AND RAIN HOOD FOR NEW COMBUSTION AIR / EXHAUST FLUE PENETRATION - SEE DETAIL 6/A1.00
8	REMOVE EXISTING RADIATOR AND RADIATOR SHROUD- PATCH AND REPAIR WALL AND FLOOR TO MATCH EXISTING WOOD FLOORING PATCH AND PAINT WALL TO LEVEL 4 FINISH - TYPICAL THESE AREAS
9	REMOVE EXISTING RADIATOR - PATCH AND REPAIR WALL AND FLOOR TO MATCH EXISTING CONCRETE FLOORING COLOR AND FINISH. PATCH EXISTING BRICK AS NEEDED AND OR AS REQUIRED TO MATCH EXISTING WALL - TYPICAL THESE AREAS
9A	REMOVE EXISTING RADIATOR AND ASSOCIATED PIPING AND INFRASTRUCTURE TO FACILITATE INSTALLATION OF NEW ELECTRIC FIN TUBE HEATER - PATCH AND REPAIR EXISTING CERAMIC TILE WALL AND LVT FLOOR TO MATCH EXISTING WALL AND FLOORING, COLOR AND FINISH. PATCH EXISTING GYP. BD. WALL AS NEEDED AND OR AS REQUIRED TO MATCH EXISTING WALL - TYPICAL THIS ARE
9B	REMOVE EXISTING RADIATOR AND ASSOCIATED PIPING AND INFRASTRUCTURE - PATCH AND REPAIR EXISTING CERAMIC TILE WALL AND LVT FLOOR TO MATCH EXISTING FLOORING COLOR AS NEEDED AND OR AS REQUIRED TO MATCH EXISTING WALL - TYPICAL THIS AREA
10	EXISTING GENERATOR TO REMAIN

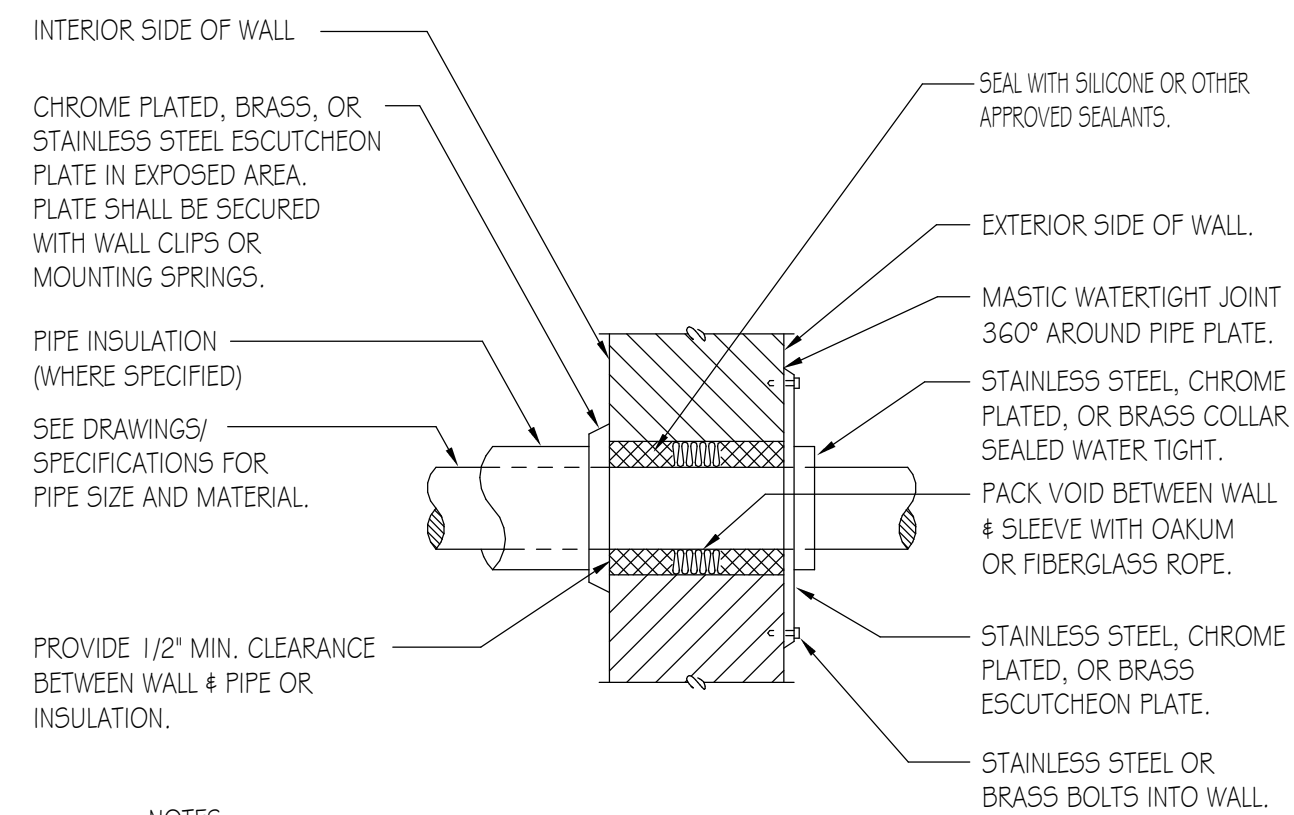
GENERAL NOTES - FLOOR PLAN	
A.	FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS.
B.	WALLS THAT TERMINATE AGAINST A DISSIMILAR MATERIAL ARE TO RECEIVE J-BEAD TRIM ALONG THE ENTIRE EDGE AND THE JOINT SEALED.
C.	SEE CODE COMPLIANCE PLANS FOR FIRE RATING OF WALLS AND UL RATED ASSEMBLY TO BE FOLLOWED.
D.	DOORS JAMB, HINGE SIDE, TO BE 4" FROM ADJACENT WALL U.O.
E.	INFILL ALL HOLES IN CONCRETE FLOOR AND OR SLAB ON GRADE THAT ARE NOT IN USE, FULL DEPTH. USE A CEMENTITIOUS FILL MATERIAL. PROVIDE TEMPORARY FRAMING TO HOLD FILL MATERIAL IN PLACE.
F.	FURNITURE SHOWN IS FOR REFERENCE ONLY.
G.	CONTRACTOR SHALL SALVAGE ALL WINDOW SHADES.
H.	ALL WOOD SHALL BE PRESERVATIVE TREATED, NO. 2 OR BETTER GRADE.

FLOOR PLAN LEGEND:	
101	ROOM TAG
101	DOOR AND FRAME TAG
1	PARTITION TAG
2	NEW WORK SHEET NOTE



**GENERAL REMODELING NOTES - ALL CONTRACTORS**

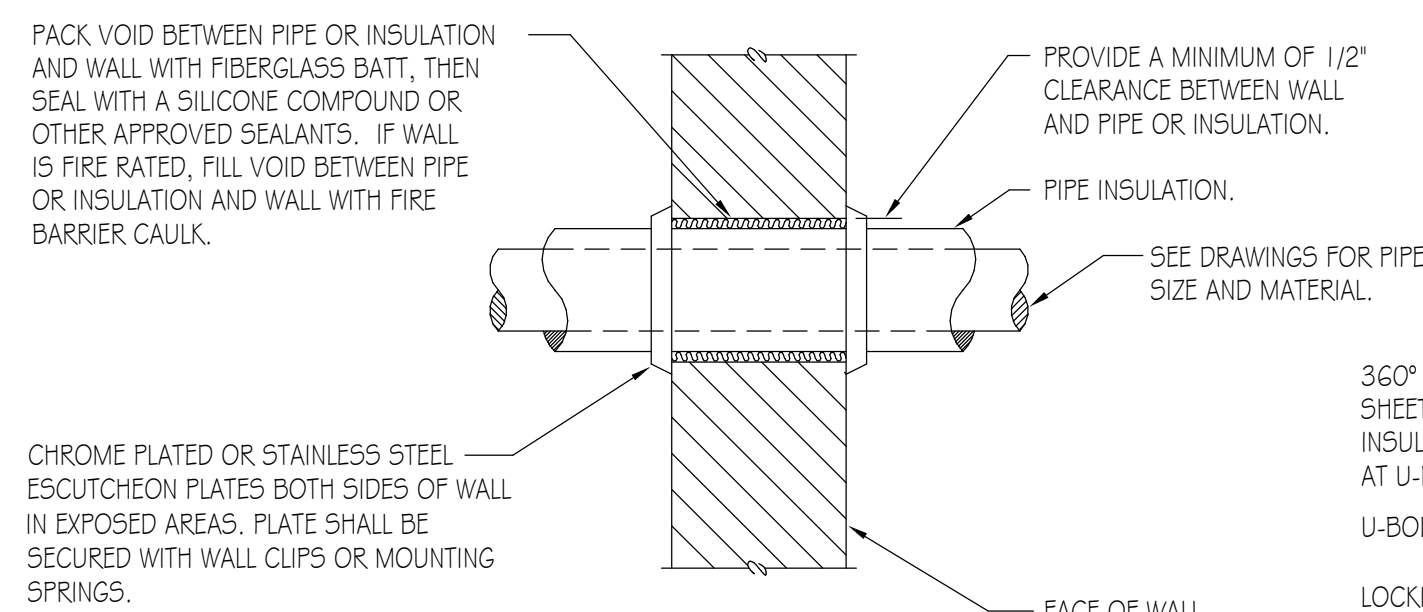
1. ALL WORK SHOWN ON DRAWINGS SHALL BE CONSIDERED NEW AND IN CONTRACT UNLESS SPECIFICALLY INDICATED OTHERWISE.
2. DRAWINGS ARE GENERALLY DIAGRAMMATIC. ROUTING OF PIPING, DUCTWORK, CONDUITS, RACEWAYS, ETC. AS SHOWN ON DRAWINGS, DOES NOT INTEND TO SHOW EVERY RISE, DROP, OFFSET, FITTING NOR EVERY STRUCTURAL ELEMENT THAT MAY BE ENCOUNTERED DURING THE INSTALLATION OF THIS WORK. EACH CONTRACTOR SHALL MAKE ANY REQUIRED CHANGES FROM THE GENERAL ROUTING SHOWN ON THESE DRAWINGS, SUCH AS OFFSETS, BENDS OR CHANGES IN ELEVATION DUE TO COORDINATION WITH THE WORK OF OTHER TRADES AND BUILDING CONSTRUCTION. ALL CHANGES SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR DELAY IN COMPLETION DATE OF THE PROJECT.
3. IT IS INTENDED THAT EQUIPMENT SHALL BE LOCATED SYMMETRICALLY WITH THE ARCHITECTURAL ELEMENTS OF THE BUILDING, NOTWITHSTANDING THE FACT THAT LOCATIONS INDICATED BY THESE DRAWINGS MAY BE DISTORTED FOR CLEARNESS OF PRESENTATION.
4. CONTRACTOR SHALL CHECK DRAWINGS OF OTHER TRADES TO VERIFY THAT SPACES IN WHICH THEIR WORK WILL BE INSTALLED ARE CLEAR OF OBSTRUCTIONS. WORK SHALL BE INSTALLED TO MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS AT ALL POINTS IN THE BUILDING. WHERE HEADROOM OR SPACE CONDITIONS APPEAR INADEQUATE, CONTRACTOR SHALL NOTIFY OWNER/ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE INSTALLATION OF THEIR WORK.
5. CONTRACTOR SHALL FURNISH OTHER TRADES ADVANCE INFORMATION AND/OR SHOP DRAWINGS ON LOCATIONS AND SIZES OF PIPING, DUCTWORK, CONDUIT, RACEWAYS, EQUIPMENT, FRAMES, BOXES, SLEEVES AND OPENINGS, ETC. NEEDED FOR THEIR WORK TO PERMIT OTHER TRADES AFFECTED TO INSTALL THEIR WORK PROPERLY AND WITHOUT DELAY.
6. WHERE THERE IS EVIDENCE THAT WORK OF ONE TRADE WILL INTERFERE WITH WORK OF OTHER TRADES, ALL TRADES SHALL MEET ON JOB SITE TO WORK OUT SPACE CONDITIONS AND MAKE SATISFACTORY ADJUSTMENTS TO INSTALLATION OF THE NEW WORK. CONTRACTORS SHALL VERIFY EXACT LOCATIONS OF ALL DEVICES AND EQUIPMENT WITH FIELD CONDITIONS, SHOP DRAWINGS, AND WORK OF OTHER TRADES PRIOR TO ROUGH-IN. EACH CONTRACTOR SHALL BE RESPONSIBLE, AT THEIR OWN EXPENSE, FOR THE REMOVAL AND REINSTALLATION OF ANY PART OF THEIR WORK IF SAME WAS INSTALLED WITHOUT CONSULTING WITH OTHER TRADES BEFORE INSTALLING THEIR WORK.
7. CONTRACTOR SHALL PROVIDE SLEEVES IN BEAMS, FLOORS, COLUMNS AND WALLS AS SHOWN ON THE DRAWINGS, AS REQUIRED BY JOB SITE CONDITIONS, AND/OR AS SPECIFIED, WHEN INSTALLING THEIR WORK. ALL BEAMS AND COLUMNS WHICH ARE REQUIRED TO BE SLEEVED SHALL BE CUT AND REINFORCED AS REQUIRED BY FIELD CONDITIONS AND LOCATIONS AND SIZES SHALL BE CHECKED AND APPROVED BY ARCHITECT BEFORE CONTRACTOR CUTS ANY STRUCTURAL BUILDING MEMBER.
8. THE SEQUENCE FOR THE INSTALLATION OF ALL WORK SHALL BE COORDINATED BETWEEN ALL CONTRACTORS ON THE PROJECT AND IN STRICT ACCORDANCE WITH ARCHITECT/ENGINEER AND OWNERS STIPULATION AS DIRECTED.
9. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND STRUCTURAL CONTRACT DRAWINGS (BEFORE SUBMITTING THEIR BIDS) TO FAMILIARIZE THEMSELVES WITH THE EXTENT OF THE GENERAL CONTRACTORS WORK, CEILING HEIGHTS AND CLEARANCE FOR INSTALLING THEIR WORK.
10. CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL CORING, CUTTING, PATCHING, REPAIRING, REFINISHING AND REMOVAL/REPLACEMENT OF NEW OR EXISTING BUILDING CONSTRUCTION REQUIRED TO ACCOMMODATE THE INSTALLATION OR REMOVAL OF THEIR WORK. ALL PATCHING, REPAIRING AND REFINISHING WORK SHALL BE PERFORMED BY THOSE REGULARLY INVOLVED IN THAT TRADE AND SHALL MATCH THE ADJACENT CONSTRUCTION AS CLOSELY AS POSSIBLE. CARE SHALL BE TAKEN SO AS NOT TO DAMAGE ANY EXISTING BUILDING CONSTRUCTION OR ITEMS THAT ARE TO REMAIN. ANY EXISTING FINISHES THAT ARE DAMAGED DURING THE INSTALLATION OF NEW WORK OR REMOVAL OF EXISTING WORK SHALL BE REPAIRED, REPLACED AND PAID FOR BY THE INSTALLING CONTRACTOR, TO THE SATISFACTION OF THE ARCHITECT AND OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR EXISTING BUILDING CONSTRUCTION THAT IS TO REMAIN AND, THEREFORE, SUBJECT TO PATCHING, REPAIRING, REFINISHING, AND REMOVAL/REPLACEMENT. (NOTE: CONTRACTOR SHALL VERIFY EXISTING BUILDING'S ROOF WARRANTY AND EMPLOY OTHER SUBCONTRACTOR(S) AS REQUIRED BY ROOF MANUFACTURER'S REPRESENTATIVE SO AS NOT TO VOID OWNER'S ROOF WARRANTY.)
11. SOME OF THE EXISTING ITEMS AND EQUIPMENT SCHEDULED TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER. ANY ITEMS THAT THE OWNER WANTS TO RETAIN SHALL BE REMOVED CAREFULLY SO AS NOT TO DAMAGE THEM. ALL OTHER ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR OWN CLEAN-UP DURING CONSTRUCTION. IF CONTRACTOR FAILS TO PROVIDE SUCH CLEAN-UP, THE ARCHITECT/ENGINEER WILL DIRECT ANOTHER CONTRACTOR TO PERFORM THE CLEAN-UP AND THE NEGLIGENT CONTRACTOR SHALL PAY THE ASSOCIATED BACK-CHARGES AS DEEMED APPROPRIATE BY THE ARCHITECT/ENGINEER.
13. CONTRACTOR SHALL INSTALL ALL AUXILIARY SUPPORTING STEEL AS REQUIRED FOR THE SUPPORTING OF THEIR PIPING, DUCTWORK, CONDUIT, TANKS, EQUIPMENT, ETC. ALL SUPPORTING STEEL FOR ITEMS ABOVE A SUSPENDED CEILING SHALL BE FROM BUILDING STRUCTURAL MEMBERS ONLY.
14. IT IS MANDATORY THAT THE COMPLETE EXISTING BUILDING REMAIN IN CONTINUOUS AND NON-INTERRUPTED OPERATION DURING REMODELING/ALTERING OF SAID EXISTING BUILDING. THE SPECIFIC AREA(S) BEING REMODELED/ALTERED AT ANY SCHEDULED TIME ARE OBVIOUSLY EXCLUSIVE OF THIS STATEMENT. SERVICES TO EXISTING BUILDING SHALL BE KEPT IN CONTINUOUS OPERATION INCLUDING POWER, SIGNAL SYSTEMS, LIGHTING, TELEPHONE, HEATING, COOLING, VENTILATING, TEMPERATURE CONTROL, SEWERS AND HOT AND COLD WATER. ANY ABSOLUTELY NECESSARY INTERRUPTION OF THESE SERVICES TO ACCOMPLISH CONTRACT WORK SHALL BE ARRANGED WITH THE OWNER A MINIMUM OF TEN (10) WORKING DAYS IN ADVANCE. SUCH INTERRUPTIONS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AS FAR AS TIME INTERVAL IS INVOLVED AND TEMPORARY SERVICES SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT WHERE NECESSARY TO ACCOMPLISH THIS PURPOSE. TEMPORARIES SHALL BE REMOVED BY THE CONTRACTOR ONLY AFTER NEW PERMANENT SERVICES ARE INSTALLED AND FULLY OPERATIONAL.
15. UNLESS INDICATED OTHERWISE, THE ARCHITECT/ENGINEER MAKES NO REPRESENTATION AS TO WHETHER OR NOT ANY HAZARDOUS OR CONTAMINATED MATERIALS (INCLUDING BUT NOT LIMITED TO ASBESTOS, PCB'S, CONTAMINATED SOILS, ETC.) ARE PRESENT WITHIN THE EXISTING BUILDING OR ON THE SITE. WORK SHOWN ON THE DRAWINGS AND/OR INDICATED IN THE SPECIFICATIONS SHALL NOT BE CONSTRUED TO CALL FOR CONTACT WITH ANY OF THESE MATERIALS. IF THESE MATERIALS ARE ENCOUNTERED OR SUSPECTED, THE CONTRACTOR SHALL NOT DISTURB THEM AND SHALL CONTACT THE ARCHITECT/ENGINEER IMMEDIATELY.
16. WHERE WORK CALLED FOR ON THE DRAWINGS OR IN THE SPECIFICATIONS INVOLVES THE REMOVAL OR RELOCATION OF PIPING OR EQUIPMENT CONTAINING REFRIGERANT, ALL REFRIGERANT SHALL BE RECOVERED BY APPROVED METHODS PER EPA REGULATIONS.
17. CONTRACTOR SHALL STORE ALL MATERIALS AND EQUIPMENT SHIPPED TO THE SITE IN A PROTECTED AREA. IF MATERIAL IS STORED OUTSIDE OF THE BUILDING, IT MUST BE STORED OFF THE GROUND A MINIMUM OF SIX INCHES (6") SET ON 6 X 6 PLANKS AND/OR WOOD PALLETES. ALL MATERIAL AND EQUIPMENT MUST BE COMPLETELY COVERED WITH WATERPROOF TARP'S OR VISQUIN. ALL PIPING AND DUCTWORK WILL HAVE THE ENDS CLOSED TO KEEP OUT DIRT AND OTHER DEBRIS. NO EQUIPMENT WILL BE ALLOWED TO BE STORED OUTSIDE THE BUILDING ON THE SITE UNLESS IT IS SUPPORTED OFF THE GROUND AND COMPLETELY PROTECTED WITH WEATHERPROOF COVERS.
18. THE DRAWINGS, SCHEDULES AND SPECIFICATIONS HAVE BEEN PREPARED USING ONE MANUFACTURER FOR EACH PIECE OF EQUIPMENT AS THE BASIS FOR DIMENSIONAL DESIGN. IF THE CONTRACTOR PURCHASES EQUIPMENT FROM A SPECIFIED ACCEPTABLE MANUFACTURER, BUT NOT THE SCHEDULED MANUFACTURER USED FOR THE BASE DESIGN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL THE DIMENSIONS OF THE EQUIPMENT TO VERIFY THAT IT WILL FIT IN THE SPACE SHOWN ON THE DRAWINGS. MINOR DEVIATIONS IN DIMENSIONS WILL BE PERMITTED, PROVIDED THE RATINGS MEET THOSE SHOWN ON THE DRAWINGS AND EQUIPMENT WILL PHYSICALLY FIT INTO THE SPACE ALLOCATED WITH SUITABLE ACCESS AROUND EQUIPMENT FOR OPERATION AND MAINTENANCE OF THE EQUIPMENT. WHEN EQUIPMENT SUBMITTED FOR REVIEW DOES NOT MEET THE PHYSICAL SIZE OR ARRANGEMENT OF THAT SCHEDULED AND SPECIFIED, CONTRACTOR SHALL PAY FOR ALL ALTERATIONS REQUIRED TO ACCOMMODATE SUCH EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR WILL ALSO PAY ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, OWNER, ARCHITECT OR ENGINEER TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT TO FIT IN THE SPACE AND FUNCTION AS INTENDED.
19. CONTRACTOR AND/OR MANUFACTURER SHALL VERIFY THAT THE CHARACTERISTICS OF THE EQUIPMENT SUBMITTED FOR REVIEW MEETS THE CAPACITY AND DUTY SPECIFIED. WHEN EQUIPMENT SUBMITTED FOR REVIEW REQUIRES MODIFICATIONS TO THE WORK OF OTHER CONTRACTORS, SUBMITTING CONTRACTOR SHALL PAY FOR ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, OWNER, ARCHITECT OR ENGINEER TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT FUNCTION SAFELY AND PROPERLY.
20. CONTRACTOR SHALL FIELD VERIFY THE SIZE OF EXISTING OPENINGS, WINDOWS, DOORS, CORRIDORS, ROOMS, ETC. FOR ACCESS OF THE NEW EQUIPMENT INTO OR REMOVAL OF EXISTING EQUIPMENT FROM THE BUILDING. IF OPENINGS ARE TOO SMALL FOR ACCESS THEN CONTRACTOR SHALL, AT THEIR OWN EXPENSE, PROVIDE NEW OR ENLARGED OPENINGS AND RESTORE SAME TO ORIGINAL SIZE AND CONDITION. CONTRACTOR MAY ELECT TO ORDER THE EQUIPMENT DISASSEMBLED AND/OR WITH SPLIT HOUSING FOR ENTRANCE INTO THE EXISTING SPACE OR BUILDING. CONTRACTOR SHALL REASSEMBLE EQUIPMENT AFTER IT IS IN THE SPACE AT THEIR OWN EXPENSE.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND THEIR ASSOCIATED FEES.
22. CONTRACTOR SHALL SUBMIT DIGITAL COPIES OF SHOP DRAWINGS OF ALL EQUIPMENT, DIFFUSERS, REGISTERS, TEMPERATURE CONTROL SYSTEM, AND ELECTRICAL DEVICES TO ENGINEER FOR APPROVAL PRIOR TO ORDERING ANY ITEMS OR FABRICATING ANY DUCTWORK.
23. CONTRACTOR SHALL PROVIDE OWNER TRAINING ON ALL EQUIPMENT AND BUILDING SYSTEMS PROVIDED/ALTERED BY THEIR WORK. TRAINING SHALL BE ACCOMPLISHED DURING TIME DEDICATED FOR THAT PURPOSE, NOT IN CONJUNCTION WITH SERVICE WORK. SEE SPECIAL TEMPERATURE CONTROL TRAINING INSTRUCTIONS ELSEWHERE.
24. AT COMPLETION OF PROJECT, CONTRACTOR SHALL SUBMIT ONE PHYSICAL AND DIGITAL COPIES OF OPERATION AND MAINTENANCE MANUALS FOR ALL WORK PROVIDED BY THEM ON PROJECT. MANUALS SHALL BE CLEARLY ORGANIZED AND CONTAIN COPIES OF APPROVED EQUIPMENT, SHOP DRAWINGS, EQUIPMENT PARTS LISTS, SERVICE CONTACTS, CONTRACTOR AND MANUFACTURER WARRANTIES, AND "AS BUILT" FLOOR PLANS.
25. CONTRACTOR SHALL PROVIDE WARRANTY FOR ALL MATERIAL AND GUARANTEE ALL WORKMANSHIP PROVIDED BY THEM FOR 1 (ONE) YEAR FROM SUBSTANTIAL COMPLETION OF WORK INVOLVED.
26. CONTRACTOR SHALL MAINTAIN A CURRENT CITY OF OAK PARK LICENSE THROUGHOUT ALL PHASES OF CONSTRUCTION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE ALL INSPECTIONS WITH THE VILLAGE OF OAK PARK OFFICIALS.
27. IDENTIFY ALL PIPING AND DUCTWORK WITH PLASTIC LABELS INDICATING CONTENTS AND FLOW DIRECTION. MARKERS TO BE PLACED AT A MAXIMUM OF 50 FT. INTERVALS AT BRANCH CONNECTIONS, AND AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. IDENTIFY VALVES, EQUIPMENT, AND PANELS WITH ENGRAVED 3-LAYER PLASTIC LAMINATED TAGS OR SIGNS.



**NOTES:**

1. CONTRACTOR SHALL ISOLATE ALL PIPES WHICH VIBRATE FROM CONSTRUCTION IN ORDER TO AVOID TRANSMISSION TO STRUCTURE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THEIR WALL OPENINGS WITH OTHER TRADES AND/OR CONTRACTORS.

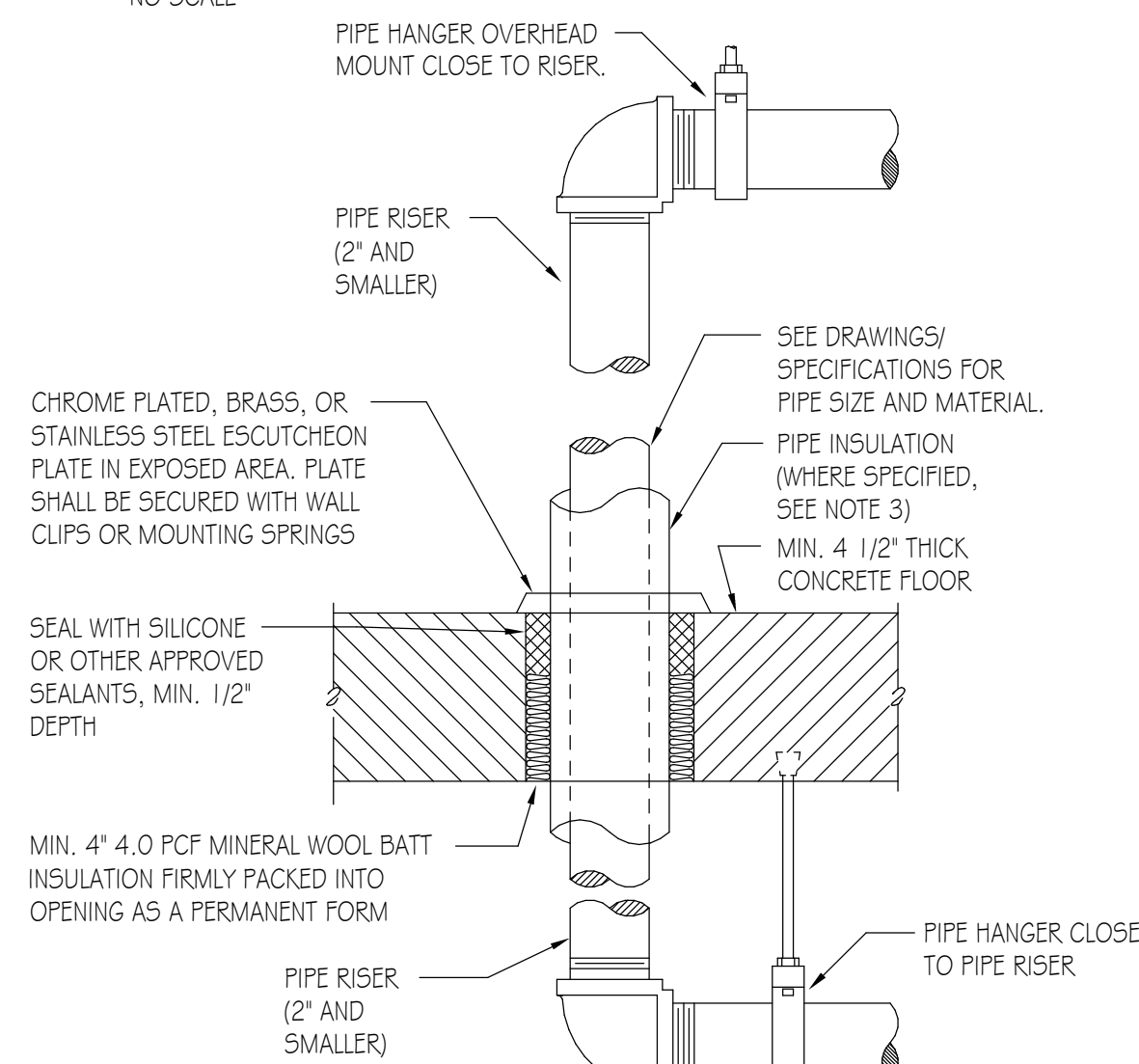
**PIPE PENETRATION OF EXTERIOR WALL ABOVE GRADE**  
NO SCALE



**NOTES:**

1. I. D. OF WALL OPENING TO BE A MIN. OF 1/2" LARGER THAN O. D. OF PIPE OR INSULATION PASSING THROUGH WALL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THEIR WALL OPENINGS WITH OTHER TRADES AND/OR CONTRACTORS.
3. PIPE PENETRATIONS OF SMOKE OR FIRE WALLS SHALL BE IN COMPLIANCE WITH NFPA-90A.

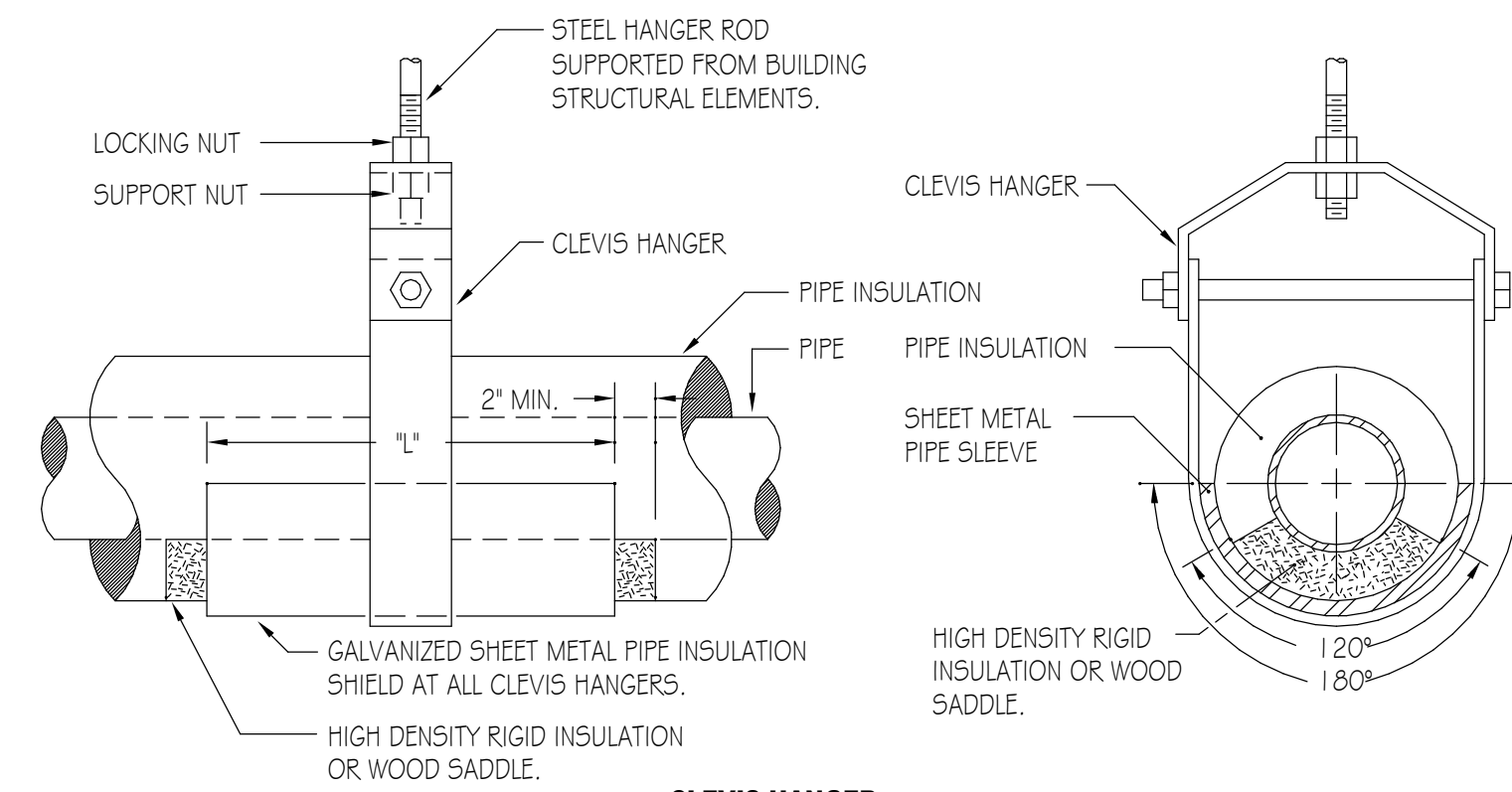
**PIPE PENETRATION OF INTERIOR WALL DETAIL**  
NO SCALE



**NOTES:**

1. CONTRACTOR SHALL ISOLATE ALL PIPES WHICH VIBRATE FROM CONSTRUCTION IN ORDER TO AVOID TRANSMISSION TO STRUCTURE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THEIR WALL OPENINGS WITH OTHER TRADES AND/OR CONTRACTORS.
3. WHERE INSULATED: 1" THICK 3.5 PCF GLASS FIBER INSULATION WITH ALL SERVICE JACKET SHALL BE UTILIZED AND SEALED WITH METAL PASTENERS OR SELF SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL PASTENERS OR WITH BUTT TAPE SUPPLIED WITH PRODUCT.

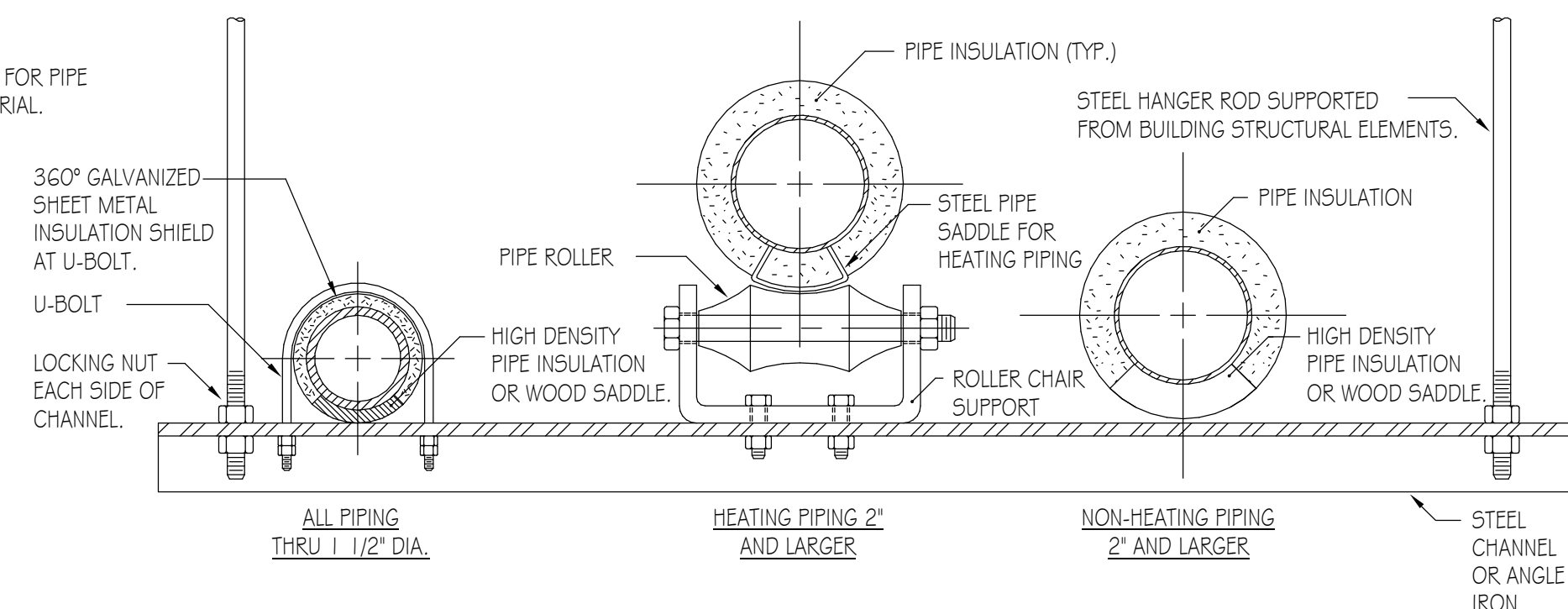
**PIPE PENETRATION OF FLOOR ASSEMBLY (DIA. 2" AND BELOW)**  
NO SCALE



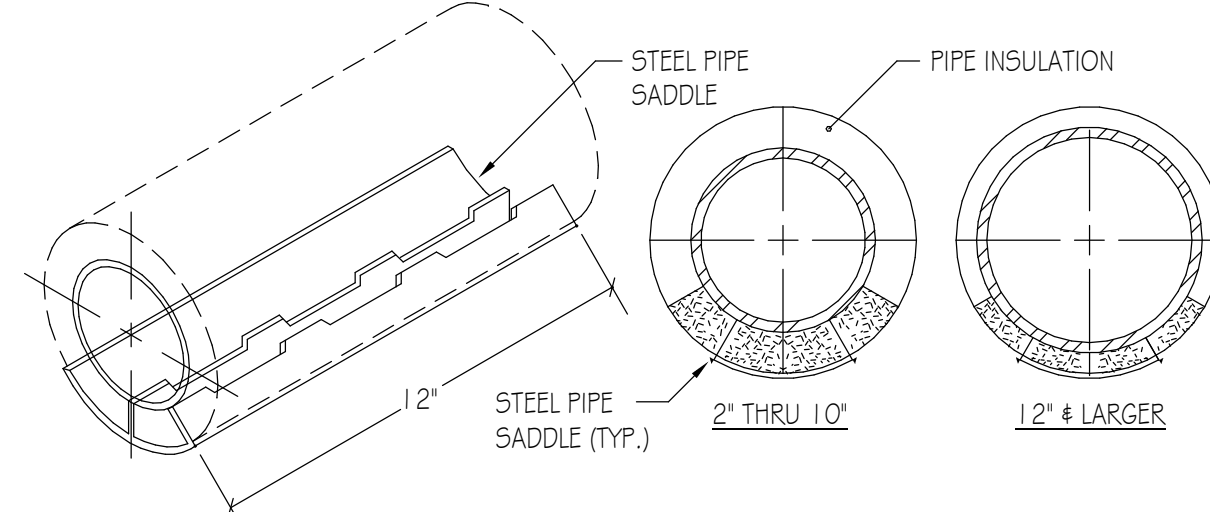
PIPE SIZE	LENGTH	GAUGE
UP TO 3/4"	8"	20 GA.
1" - 2"	12"	18 GA.
2 1/2" - 4"	12"	16 GA.
5" & 6"	18"	16 GA.
8" & UP	24"	14 GA.

**CLEVIS HANGER**

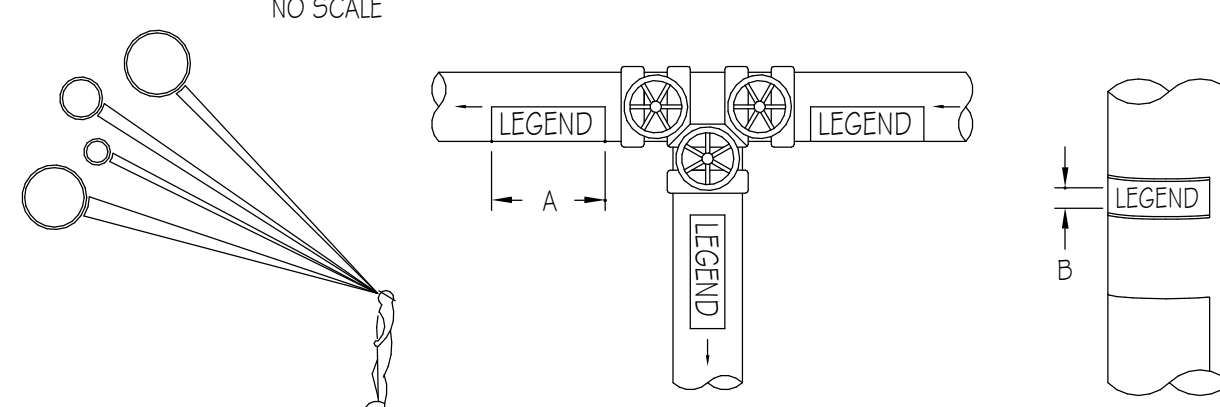
**NOTE:** 1. CONFER WITH ARCHITECT AND REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION ON ACCEPTABLE METHODS AND LOCATIONS FOR HANGER SUPPORTS.



**TRAPEZE HANGER**



**TYPICAL PIPE HANGER DETAILS**  
NO SCALE



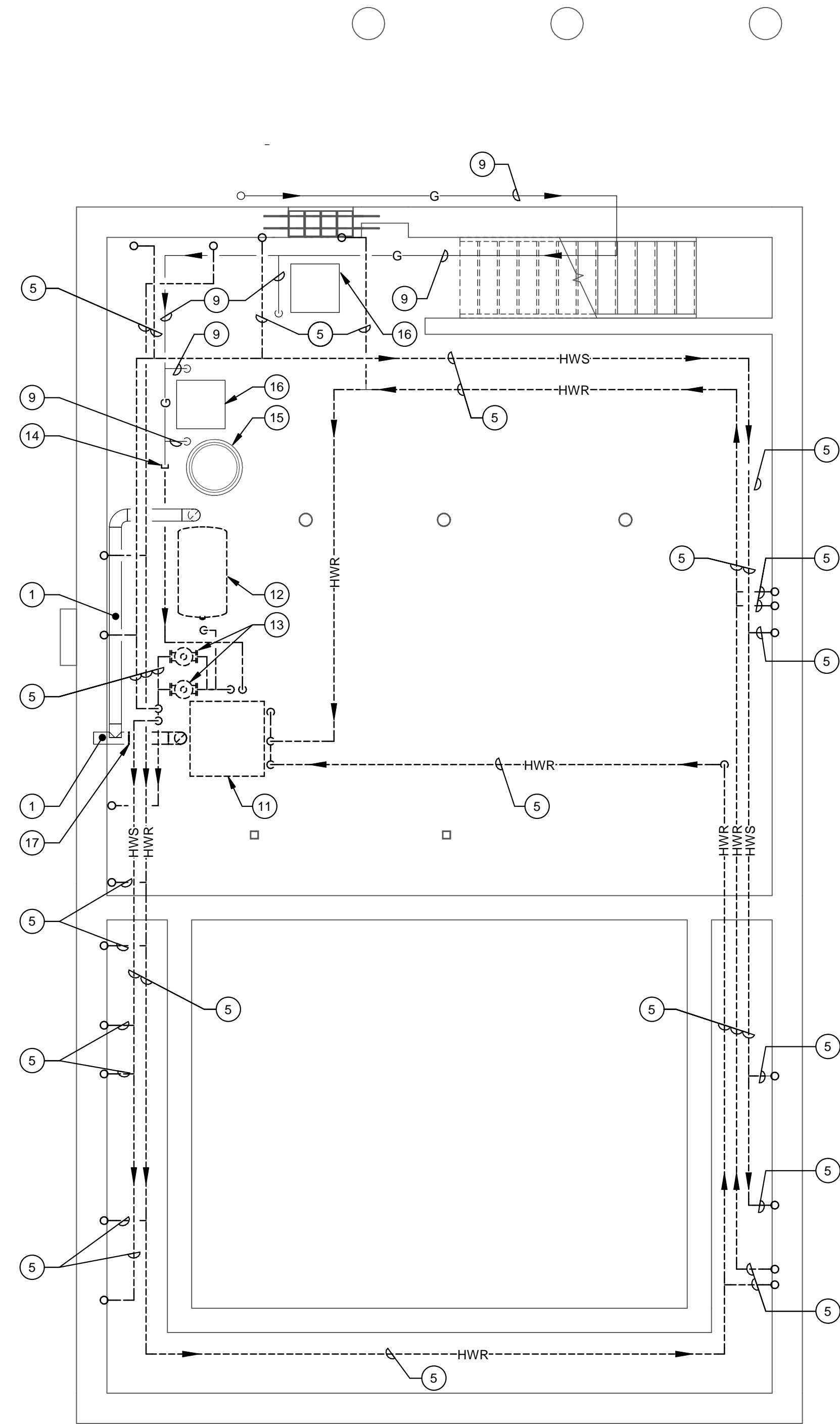
**NOTE:** IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS, ADJACENT TO ALL VALVES OR BRANCHES, AND AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING DIRECTION OF FLOW.

SIZE OF LEGEND LETTERS		
OUTSIDE DIAMETER OF PIPE OR COVERING	LENGTH OF COLOR FIELD A	SIZE OF LETTERS B
3/4" TO 1 1/4"	8"	1/2"
1 1/2" TO 2"	8"	3/4"
2 1/2" TO 6"	12"	1 1/4"
8" TO 10"	24"	2 1/2"
OVER 10"	32"	3 1/2"

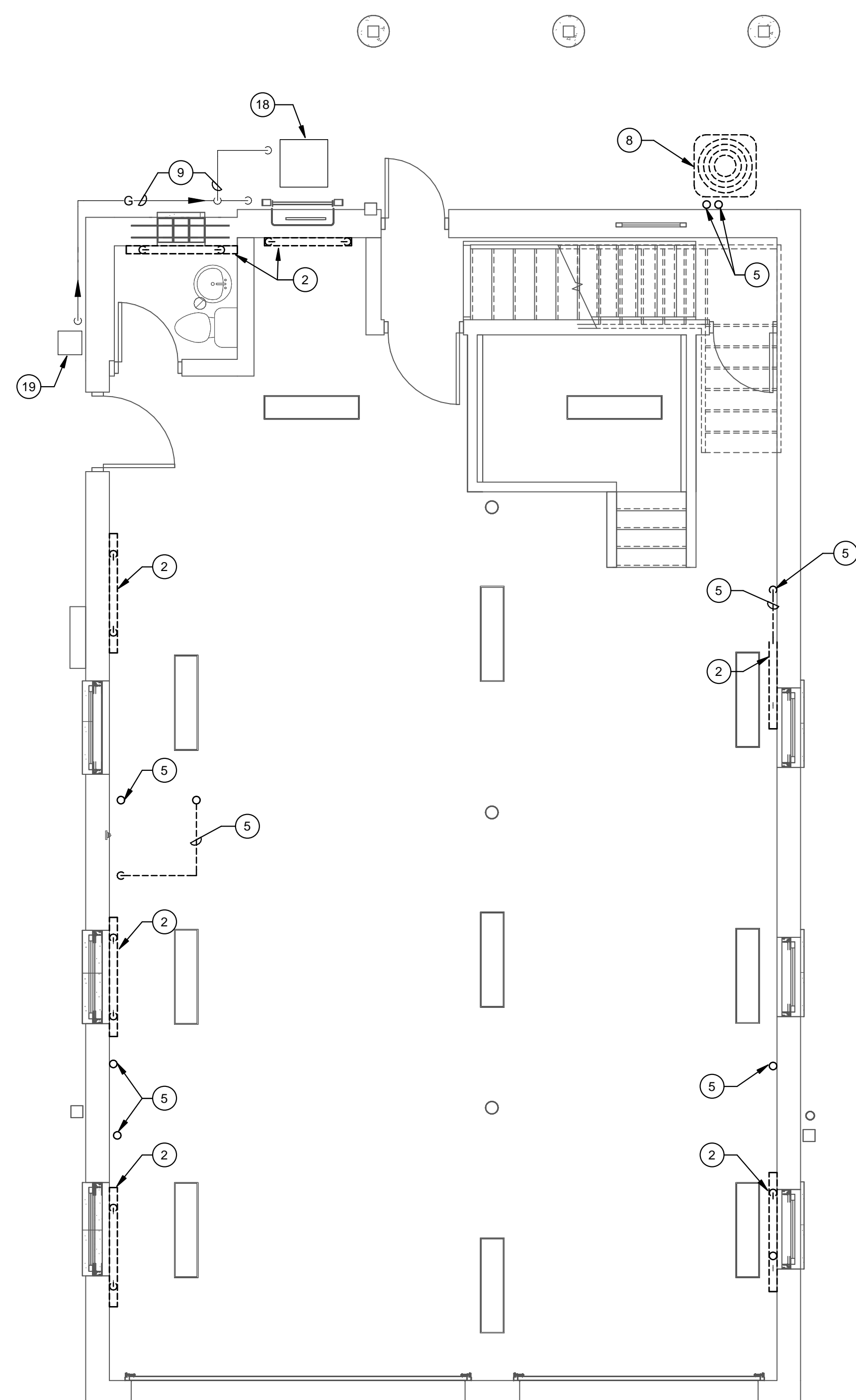
SERVICE	BACKGROUND OR COLOR BAND	LETTER COLOR
CONDENSATE	SAFETY GREEN	WHITE
REFRIGERANT SUCTION	SAFETY ORANGE	BLACK
REFRIGERANT LIQUID	SAFETY ORANGE	BLACK
NATURAL GAS	SAFETY YELLOW	BLACK

**TYPICAL PIPE IDENTIFICATION MARKERS**  
NO SCALE

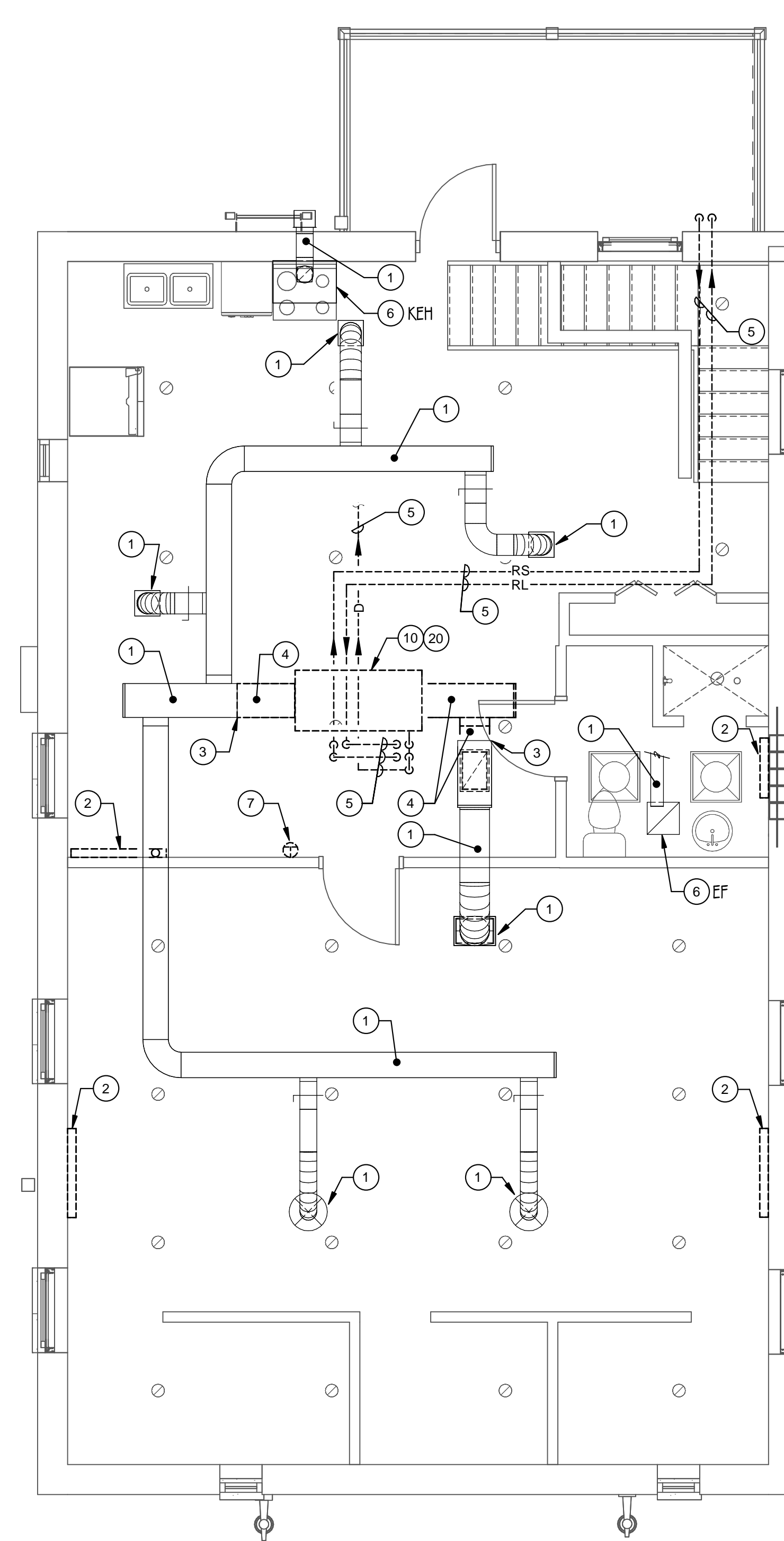
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③ BASEMENT HVAC DEMOLITION PLAN  
 1/4" = 1'-0"



② FIRST FLOOR HVAC DEMOLITION PLAN  
 1/4" = 1'-0"



① SECOND FLOOR HVAC DEMOLITION PLAN  
 1/4" = 1'-0"

**DRAWING NOTES**

- 1 EXISTING DUCTWORK, DIFFUSERS, REGISTERS, AND GRILLES TO REMAIN.
- 2 REMOVE CONVECTOR AND ALL ASSOCIATED PIPING, VALVING AND CONTROLS.
- 3 NEW CONNECTION TO BE MADE AT THIS LOCATION. REMOVE ALL DUCTWORK, DIFFUSERS, REGISTERS, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
- 4 REMOVE ALL DUCTWORK, DIFFUSERS, REGISTERS, HANGERS, INSULATION, ETC. SHOWN DASHED.
- 5 REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED.
- 6 EXISTING HVAC EQUIPMENT TO REMAIN.
- 7 REMOVE EXISTING THERMOSTAT INCLUDING ALL ASSOCIATED CONDUIT, WIRING, PNEUMATIC TUBING, ETC. LOCATED ABOVE ANY ACCESSIBLE CEILING BETWEEN THERMOSTAT AND THE UNIT IT CONTROLS. PROVIDE BLANK COVER PLATE OVER ALL ABANDONED JUNCTION BOXES IN WALLS THAT ARE TO REMAIN.
- 8 REMOVE AIR COOLED CONDENSING UNIT, CONCRETE PAD, AND ALL ASSOCIATED PIPING, VALVING, AND CONTROLS.
- 9 EXISTING PIPING AND VALVING TO REMAIN.
- 10 REMOVE SUSPENDED FAN COIL UNIT AND ALL ASSOCIATED DUCTWORK, PIPING, VALVING, CONTROLS, ETC.
- 11 REMOVE BOILER, CONCRETE PAD, AND ALL ASSOCIATED PIPING, VALVING, FLUE, BREECHING, AND CONTROLS.

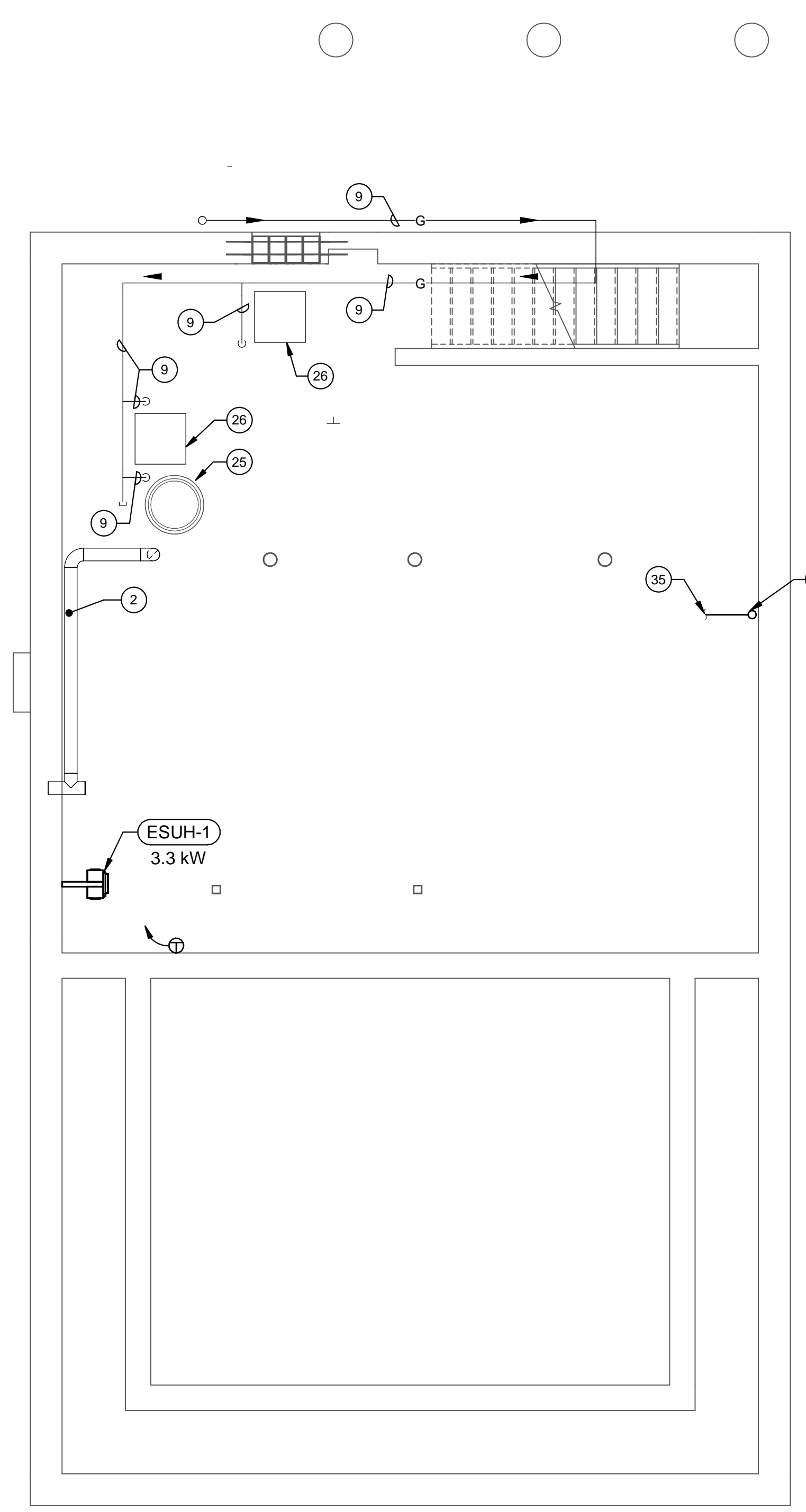
**DRAWING NOTES**

- 12 REMOVE EXPANSION TANK AND ALL ASSOCIATED PIPING, VALVING, INSULATION, HANGERS, SUPPORTS, ETC.
- 13 REMOVE INLINE PUMP AND ALL ASSOCIATED PIPING, VALVING, INSULATION, HANGERS, SUPPORTS, ETC.
- 14 CAP EXISTING PIPE AT LOCATION SHOWN AND REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
- 15 EXISTING DOMESTIC WATER HEATER TO REMAIN.
- 16 EXISTING WASHER/DRYER TO REMAIN.
- 17 CAP EXISTING DUCT AT LOCATION SHOWN AND REMOVE ALL DUCTWORK, REGISTERS, DIFFUSERS, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
- 18 EXISTING GENERATOR TO REMAIN.
- 19 EXISTING GAS METER TO REMAIN.
- 20 CAREFULLY REMOVE EXISTING BIPOLAR IONIZATION DEVICE FROM EXISTING FAN COIL UNIT AND REINSTALL IN NEW GAS FURNACE UNIT.

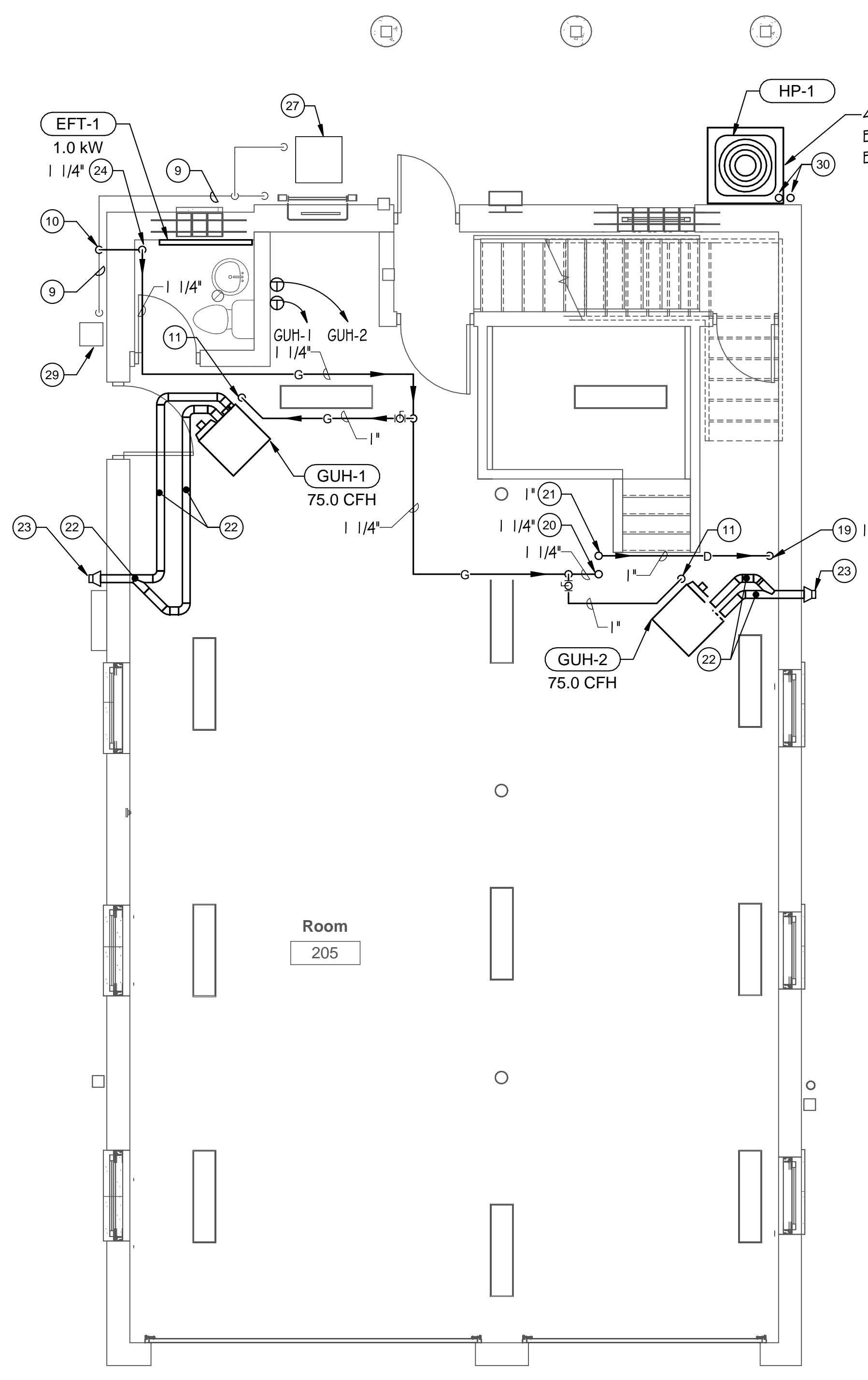
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**HVAC Demolition Plans**

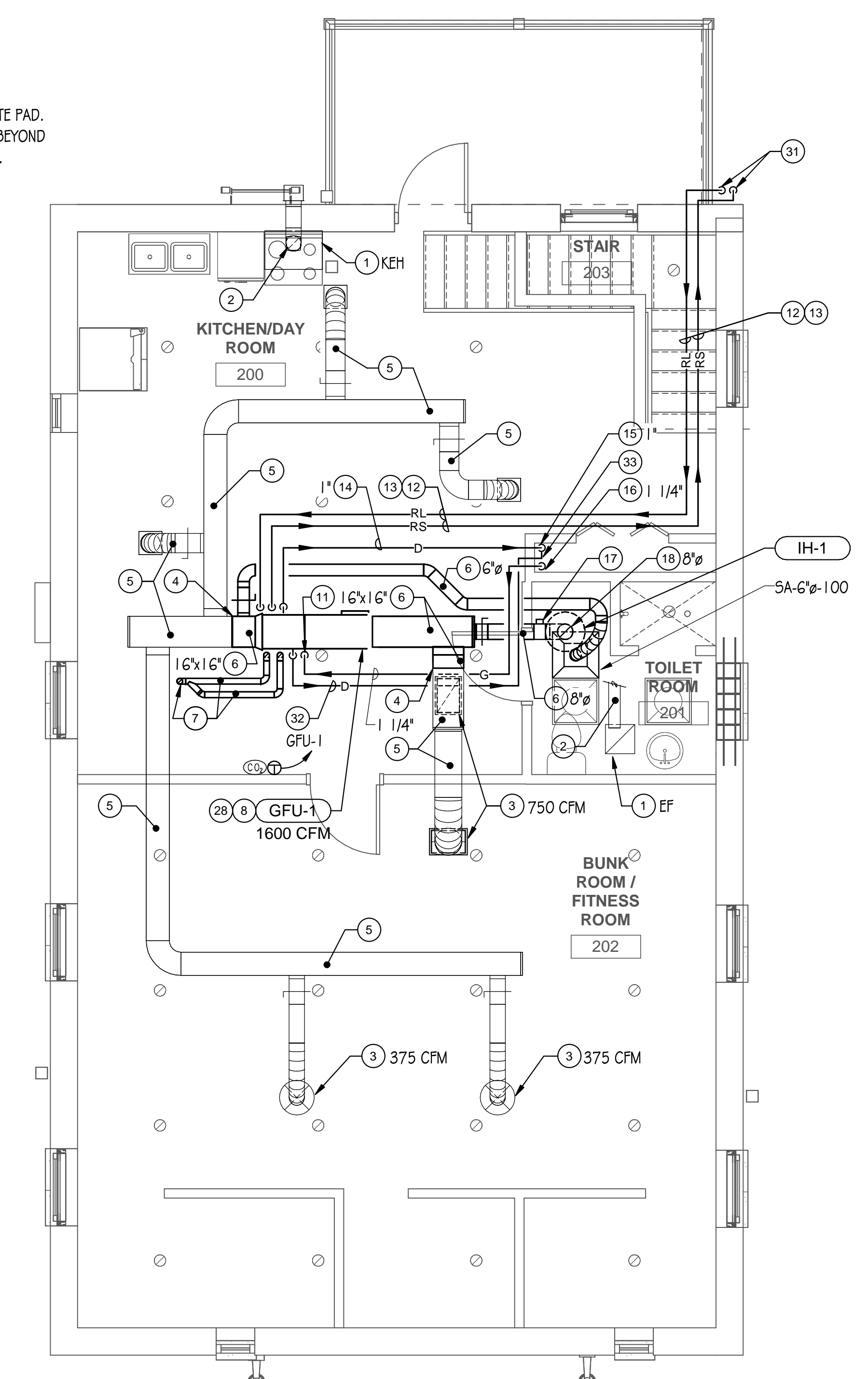
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3 BASEMENT HVAC PLAN  
 1/4" = 1'-0"



2 FIRST FLOOR HVAC PLAN  
 1/4" = 1'-0"



1 SECOND FLOOR HVAC PLAN  
 1/4" = 1'-0"

**DRAWING NOTES**

- 1 EXISTING HVAC EQUIPMENT TO REMAIN.
- 2 EXISTING DUCTWORK, DIFFUSERS, REGISTERS, AND GRILLES TO REMAIN.
- 3 BALANCE EXISTING DIFFUSER/GRILLE TO AIRFLOW RATE INDICATED.
- 4 MAKE NEW CONNECTION TO EXISTING DUCTWORK AT THIS LOCATION.
- 5 EXISTING DUCTWORK ROUTED WITHIN ATTIC SPACE TO REMAIN. WRAP EXISTING DUCTWORK WITH MINIMUM R-12 FLEXIBLE FIBERGLASS DUCT INSULATION WITH FOILED FACE.
- 6 DUCTWORK OF SIZE INDICATED TO BE ROUTED WITHIN ATTIC SPACE. WRAP DUCTWORK WITH MINIMUM R-12 FLEXIBLE FIBERGLASS DUCT INSULATION WITH FOILED FACE.
- 7 3"Ø FLUE AND COMBUSTION AIR DUCTWORK SIZED, INSULATED, AND INSTALLED PER MANUFACTURER'S REQUIREMENTS. TERMINATE THRU ROOF WITH MANUFACTURER'S CONCENTRIC TERMINATION KIT.
- 8 STEEL ROD SUSPEND FROM STRUCTURE ABOVE WITH NEOPRENE VIBRATION ISOLATORS.
- 9 EXISTING PIPING AND VALVING TO REMAIN.
- 10 MAKE NEW CONNECTION TO EXISTING PIPING AT THIS LOCATION.
- 11 MAKE FINAL FULL SIZE CONNECTION TO GAS FIRED EQUIPMENT WITH MIN. 6" DIRT LEG.
- 12 REFRIGERANT PIPING SIZED, INSULATED, SUPPORTED, AND INSTALLED IN STRICT ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTION.
- 13 REFRIGERANT PIPING TO BE ROUTED WITHIN ATTIC SPACE.
- 14 CONDENSATE DRAIN PIPING OF SIZE INDICATED TO BE ROUTED WITHIN ATTIC SPACE.
- 15 CONDENSATE DRAIN PIPING OF SIZE INDICATED DOWN IN WALL. COORDINATE EXACT DIMENSIONS AND WALL FURRING WITH ARCHITECT.
- 16 GAS PIPING OF SIZE INDICATED DOWN IN WALL. COORDINATE EXACT DIMENSIONS AND WALL FURRING WITH ARCHITECT.
- 17 INTERLOCK OPERATION OF MOTORIZED DAMPER WITH WALL MOUNTED CO2 SENSOR.

**DRAWING NOTES**

- 18 DUCTWORK OF SIZE INDICATED UP THRU ROOF.
- 19 CONDENSATE DRAIN PIPING OF SIZE INDICATED DOWN THRU FLOOR.
- 20 GAS PIPING OF SIZE INDICATED UP THRU FLOOR.
- 21 CONDENSATE DRAIN PIPING OF SIZE INDICATED UP THRU FLOOR.
- 22 4"Ø FLUE AND COMBUSTION AIR DUCTWORK SIZED AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS. TERMINATE THRU WALL WITH MANUFACTURER'S CONCENTRIC TERMINATION KIT.
- 23 MANUFACTURER'S CONCENTRIC VENT KIT ASSEMBLY.
- 24 GAS PIPING OF SIZE INDICATED DOWN ALONG WALL WITHIN PRE-FINISHED SHEET METAL PIPE CHASE OF COLOR TO BE SELECTED BY ARCHITECT. SEE DETAIL ELSEWHERE.
- 25 EXISTING DOMESTIC WATER HEATER TO REMAIN.
- 26 EXISTING WASHER/DRYER TO REMAIN.
- 27 EXISTING GENERATOR TO REMAIN.
- 28 REINSTALL EXISTING BIPOLAR IONIZATION DEVICE ON NEW GAS FURNACE UNIT IN ACCORDANCE WITH IONIZATION DEVICE MANUFACTURER'S INSTRUCTIONS.
- 29 MODIFY EXISTING GAS METER TO REMAIN TO PROVIDE 453.0 CFH AT 7" W.C. COORDINATE WITH GAS COMPANY.
- 30 REFRIGERANT PIPING UP ALONG EXTERIOR WALL.
- 31 REFRIGERANT PIPING DOWN ALONG EXTERIOR WALL.
- 32 1" FLUE STACK DRAIN ROUTED WITHIN ATTIC SPACE.
- 33 PROVIDE CONDENSATE TRAP PRIOR TO COMBINING WITH FLUE STACK DRAIN. PROVIDE CONDENSATE NEUTRALIZING KIT.
- 34 CONDENSATE DRAIN PIPING OF SIZE INDICATED UP THRU FLOOR.
- 35 TERMINATE 1" CONDENSATE DRAIN PIPING WITH DOWN TURNED ELBOW TO NEAREST FLOOR DRAIN.

**HVAC Plans**

**GENERAL NOTES - HVAC WORK:**

- ALL NEW WORK AND MATERIALS SHALL CONFORM TO VILLAGE OF OAK PARK CODE AND BUILDING STANDARDS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND INSPECTIONS AND PAYING THEIR ASSOCIATED FEES.
- CONTRACTORS SHALL SUBMIT COMPLETE COORDINATED FLOOR PLAN SHOP DRAWINGS OF HIS PROPOSED WORK INSTALLATION (1/4 INCH MINIMUM SCALE) FOR REVIEW BY ARCHITECT/ ENGINEER/OWNER. "COORDINATED" MEANS WITH WORK OF ALL OTHER TRADES INCLUDING EXISTING AND PROPOSED FEATURES OF THE GENERAL BUILDING CONSTRUCTION AND OTHER TRADES WORK.
- NOISE AND VIBRATION WILL NOT BE TOLERATED. CONTRACTOR SHALL BID ON FURNISHING EVERY DETAIL TO ASSURE THIS END.
- PATCH AND REFINISH ALL DAMAGED INSULATED SURFACES OF ALL EXISTING DUCTWORK, PIPING AND ASSOCIATED FITTINGS TO MATCH EXISTING WHERE NEW CONNECTIONS ARE BEING MADE.
- CONTRACTORS SHALL PROVIDE A ONE YEAR WARRANTY ON ALL MATERIALS, EQUIPMENT AND LABOR FROM DATE OF SUBSTANTIAL COMPLETION OF WORK EXCEPT AS FOLLOWS: PROVIDE A 5 YEAR PARTS AND LABOR WARRANTY FOR ROOFTOP UNIT COMPRESSOR; PROVIDE A 10 YEAR PARTS AND LABOR WARRANTY FOR ROOFTOP UNIT HEAT EXCHANGER.
- CONTRACTORS SHALL PROVIDE IN WARRANTY LABOR AND MANUFACTURER WILL PROVIDE IN WARRANTY PARTS FOR EQUIPMENT WHICH HAS BEEN PRE-PURCHASED BY THE OWNER. CONTRACTOR SHALL RECEIVE THIS EQUIPMENT FROM THE OWNER AT THE PROJECT SITE, THEN COMPLETE REQUIRED ASSEMBLY WORK AND PROVIDE LABOR AND PROPER INSTALLATION.
- THE LOCATIONS SHOWN FOR ALL DIFFUSERS, REGISTERS AND GRILLES, ETC. ARE DIAGRAMMATIC. EXACT LOCATION SHALL BE DETERMINED FROM THE REFLECTED CEILING PLANS AND/OR ON THE JOB SITE BY THE ARCHITECT/ENGINEER REPRESENTATIVES.
- EXCEPT AS NOTED OTHERWISE, ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK SHALL BE GALVANIZED SHEET METAL WITH SEALED JOINTS CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CURRENT SMACNA MANUAL. SIZES SHOWN ARE INSIDE FACE TO INSIDE FACE.
- THE GAUGES OF IRON FOR DUCTS AND CASINGS AND SIZE OF STRUCTURAL REINFORCING ANGLES FOR DUCTS AND CASING SHALL BE SUCH AS TO PROVIDE ABSOLUTELY AIR TIGHT CONSTRUCTION FREE FROM PULSATION, DEFORMATION, OR VIBRATION AT NORMAL OPERATING PRESSURES.
- ALL SUPPLY AND RETURN DUCTWORK IN THE MECHANICAL OR BOILER ROOM, OUTSIDE, MIXED, OR COMBUSTION AIR DUCTWORK, OR EXHAUST DUCTWORK BETWEEN THE LOUVER AND THE DAMPER SHALL BE EXTERNALLY INSULATED WITH 3 LB. DENSITY RIGID BOARD FIBERGLASS DUCT INSULATION WITH ALL SERVICE JACKET. OUTSIDE AIR AND MIXED AIR DUCTWORK TO BE INSULATED 2" THICK, SUPPLY DUCTWORK TO BE INSULATED 1 1/2" THICK.
- ALL ROUND CONCEALED FLEXIBLE DUCT SHALL BE WIREMOLD OR THERMOFLEX FACTORY INSULATED 1" THICK MAXIMUM OF 5'-0" LONG TO DIFFUSERS/REGISTERS. FLEXIBLE DUCT MAY BE UTILIZED ONLY WHERE CONCEALED ABOVE ACCESSIBLE CEILINGS.
- ALL NEW RECTANGULAR SUPPLY AND RETURN DUCTWORK SHALL BE INTERNALLY LINED 1" THICK WITH MATT FACED FIBERGLASS DUCT LINER.
- ALL SUPPLY AND RETURN DUCTWORK LOCATED IN UNHEATED ATTICS OR CRAWL SPACES AND DRYER EXHAUST DUCTS SHALL BE WRAPPED WITH MINIMUM R-12, 4 3/8" THICK FLEXIBLE FIBERGLASS DUCT INSULATION WITH FOILED FACE.
- PROVIDE MANUAL VOLUME DAMPERS AT EACH BRANCH DUCT TAKEOFF IN SUPPLY DUCTWORK AND IN RETURN/EXHAUST DUCTWORK. PROVIDE TURNING VANES IN ALL SQUARE DUCT ELBOWS.
- PAINT ALL INTERIOR DUCTWORK VISIBLE THROUGH AIR INLETS OR OUTLETS FLAT BLACK.
- BALANCE DUCT SYSTEMS TO ACCOMPLISH AIR QUANTITIES SHOWN AT ALL INLETS/OUTLETS (NEW AND EXISTING) AS SHOWN ON DRAWING AND SUBMIT TEST REPORT FOR REVIEW BY OWNER AND ENGINEER.
- ALL REFRIGERANT PIPING SHALL BE TYPE "K" COPPER WITH WROUGHT COPPER SOLDER FITTINGS AND BE SIZED PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. INSULATE REFRIGERANT SUCTION AND HOT GAS LINES WITH 3/4" THICK AP/ARMAFLEX. PROVIDE EXTERIOR INSULATION WITH 2 COATS UV RESISTANT FINISH.
- DRIP PAN DRAIN PIPING SHALL BE TYPE "M" COPPER WITH 1/2" INSULATION.
- NATURAL GAS PIPING SHALL BE SCHEDULE 40 BLACK AND CONFORM WITH ASTM STANDARDS WELDED FOR PIPE SIZES 2 1/2" AND OVER AND SCREWED FOR PIPE SIZES 2" AND UNDER. WIRE BRUSH CLEAN AND PAINT ALL PIPING AND FITTINGS WITH 2 COATS OF RUST RESISTANT PAINT.
- ALL PIPING SHALL BE SUSPENDED WITH CLEVIS AND/OR TRAPEZE PIPE HANGERS. INSULATED PIPING SHALL REST ON SHEET METAL INSULATION SHIELDS. (ANCHORS SHALL BE DRILLED INTO EXISTING FLOOR CONSTRUCTION).
- BALL VALVES SHALL BE STOCKHAM, MILWAUKEE, OR NIBCO MSS SP 110, 400 PSI WOG, ONE PIECE BRONZE BODY, CHROME PLATED BRASS BALL, FULL PORT, TEFLON SEATS, BLOW-OUT PROOF STEM, SOLDER ENDS, LEVER HANDLE.
- PROVIDE GAS SHUT-OFF VALVE AT EACH PIECE OF EQUIPMENT AND PRESSURE REGULATORS WHERE REQUIRED. VENT ALL PRESSURE REGULATORS WITHIN THE BUILDING FULL SIZE TO BUILDING EXTERIOR.
- GAS FURNACE UNIT SHALL HAVE A WEB-BASED 7-DAY PROGRAMMABLE COLOR TOUCH THERMOSTAT WITH DEMAND CONTROL VENTILATION SEQUENCE AND HEATING/COOLING STAGES TO MATCH INSTALLATION.
- ELECTRIC SUSPENDED UNIT HEATER SHALL HAVE STAND-ALONE ELECTRIC THERMOSTAT.
- LOW VOLTAGE WIRING SHALL BE UL LISTED AND PLENUM RATED (LOW SMOKE PRODUCING). WIRING SHALL BE CONCEALED IN WALLS AND MAY BE INSTALLED WITHOUT CONDUIT ABOVE ACCESSIBLE LAY-IN CEILING SPACES ONLY.

**BIDDING NOTE:**  
SEE DRAWINGS ME1.00 FOR GENERAL NOTES AND ADDITIONAL DETAILS APPLICABLE TO THIS TRADE'S WORK.

**HVAC SYMBOLS AND ABBREVIATIONS**

ACCU	AIR COOLED CONDENSING UNIT		HWS	HOT WATER SUPPLY
A.F.F.	ABOVE FINISHED FLOOR		HWR	HOT WATER RETURN
AP	ACCESS PANEL		G	NATURAL GAS
BHP	BRAKE HORSEPOWER		RS	REFRIGERANT SUCTION
BOP	BOTTOM OF PIPE		RL	REFRIGERANT LIQUID
BTU	BRITISH THERMAL UNIT		D	DRAIN LINE
BTUH	BRITISH THERMAL UNIT PER HOUR			BALL VALVE (2" & SMALLER) BUTTERFLY VALVE (2 1/2" & LARGER)
CFM	CUBIC FEET PER MINUTE			RAIN VALVE WITH HOSE THREADED OUTLET
CV	CONVECTOR			PIPE UNION (OR FLANGES IF 2 1/2" OR LARGER PIPE)
D	DRAIN LINE			DIRECTION OF FLOW
DB	DRY BULB			PITCH OF PIPE (DOWN)
DN.	DOWN			PIPE ELBOW (TURNED UP)
EAT	ENTERING AIR TEMPERATURE			PIPE ELBOW (TURNED DOWN)
EF	EXHAUST FAN			PIPE TEE DOWN (DROP)
ESP	EXTERNAL STATIC PRESSURE			PIPE TEE UP
ET	EXPANSION TANK			PIPE TEE UP OR ANGLE
ESUH	ELECTRIC SUSPENDED UNIT HEATER			PIPE TEE DOWN OR ANGLE
F	FAHRENHEIT			NEW CONNECTION
FCU	FAN COIL UNIT			GAS PRESSURE REGULATOR
FD	FLOOR DRAIN			FLEXIBLE DUCT CONNECTION
FPM	FEET PER MINUTE			MANUAL SINGLE BLADE OR OPPOSED BLADE DAMPER
G	GAS PIPING			MOTOR OPERATED DAMPER
GC	GENERAL CONTRACTOR			AIR FLOW
GFU	GAS FURNACE UNIT			DUCT SIZE FREE AREA (1ST FIGURE, SIDE OF DUCT SHOWN)
GUH	GAS UNIT HEATER			CROSS-SECTION OF SUPPLY OR OUTSIDE AIR INTAKE DUCT
HP	HORSEPOWER			CROSS-SECTION OF RETURN OR EXHAUST DUCT
HWB	HOT WATER BOILER			INCLINED RISE (R) OR DROP (D)
HWP	HOT WATER CIRCULATING PUMP			90° ELBOW WITH TURNING VANES
HWR	HOT WATER RETURN			90° BRANCH TAKE-OFF W/45 DEGREE ENTRY
HWS	HOT WATER SUPPLY			ROUND FLEXIBLE DUCT
IH	INTAKE HOOD			SQUARE OR RECTANGLE DUCT TRANSITION
LAT	LEAVING AIR TEMPERATURE			SQUARE OR RECTANGLE TO ROUND DUCT TRANSITION
MCA	MINIMUM CIRCUIT AMPS			DUCT UP TO ROOF MOUNTED EXHAUST FAN OR VENTILATOR
MOCF	MAXIMUM OVERCURRENT PROTECTION			EQUIPMENT TAG
MOD	MOTOR OPERATED DAMPER			WALL THERMOSTAT OR TEMPERATURE SENSOR
NC	NEW CONNECTION			WALL THERMOSTAT OR TEMPERATURE SENSOR WITH GUARD
NK	NECK			WALL CARBON DIOXIDE SENSOR
PD	PRESSURE DROP			ROUND
PE	PIPE ENCLOSURE			PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED
PH	PHASE			
PSI	POUNDS PER SQUARE INCH			
RPM	REVOLUTIONS PER MINUTE			
SP	STATIC PRESSURE			
TSP	TOTAL STATIC PRESSURE			
TYP.	TYPICAL			
WB	WET BULB			
W.C.	WATER COLUMN			



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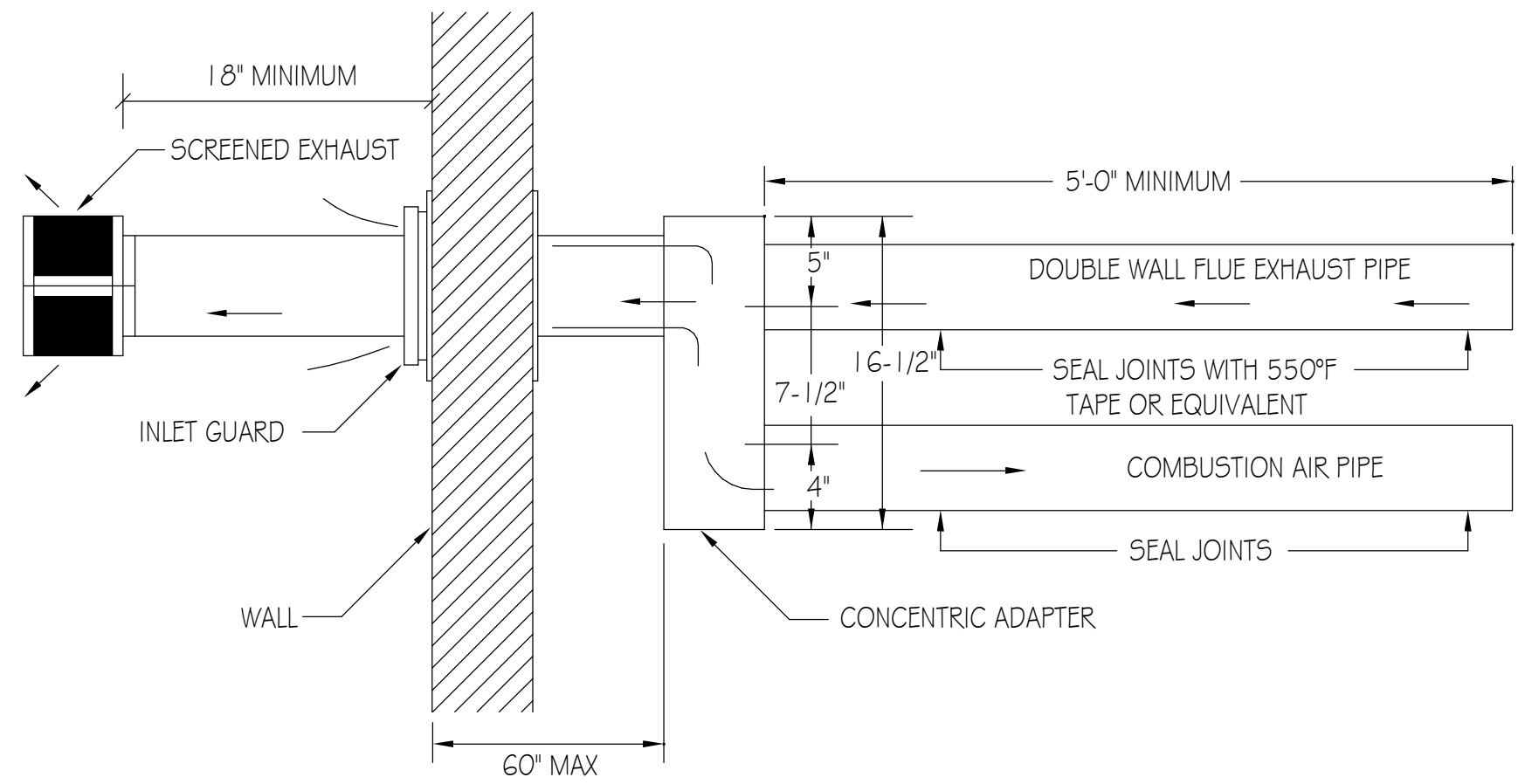
Fire Station #2 Mechanical Equipment Replacement

Village of Oak Park  
212 Augusta St, Oak Park, IL 60301

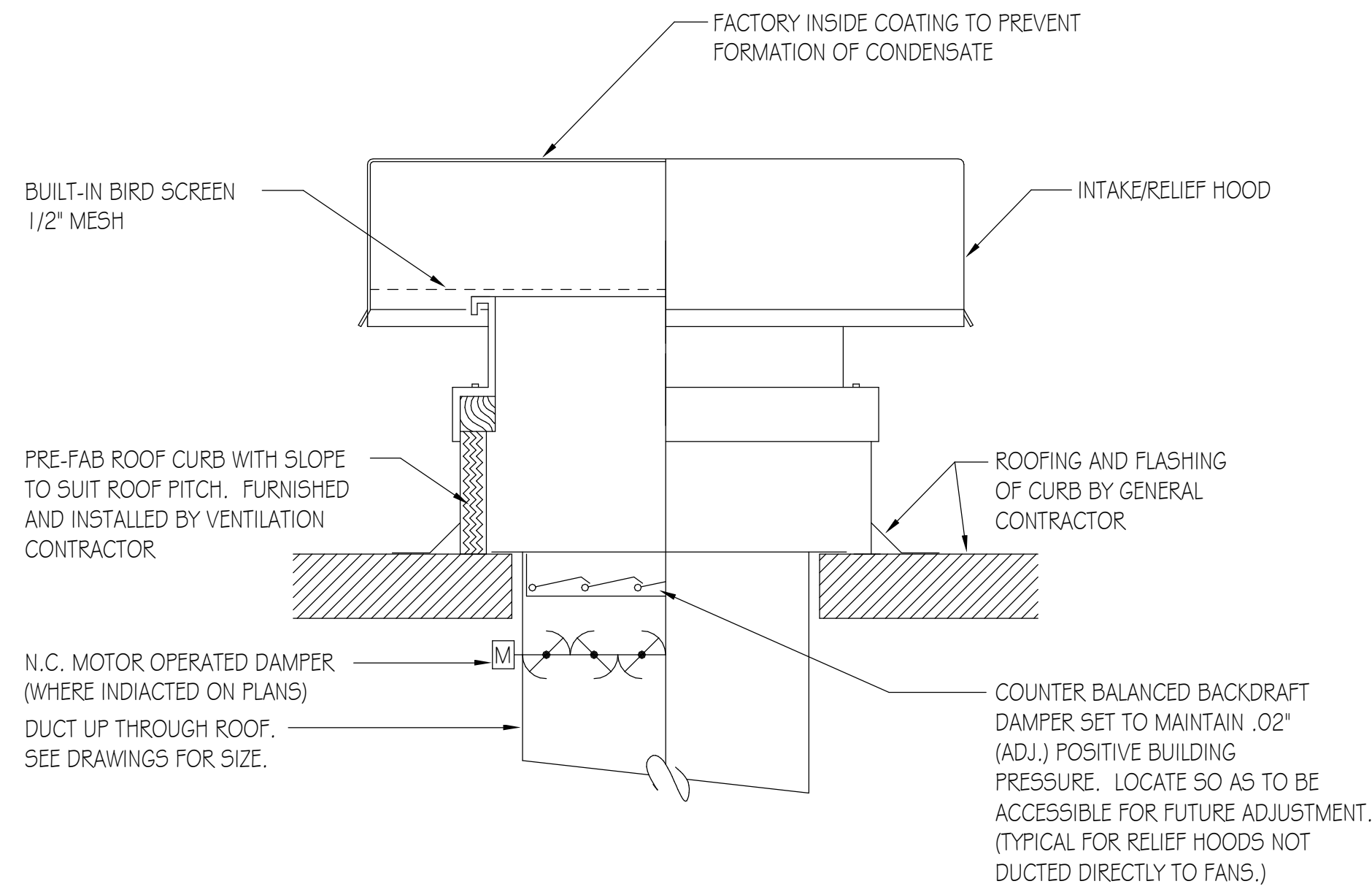
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**HVAC Notes, Legend, and Specifications**

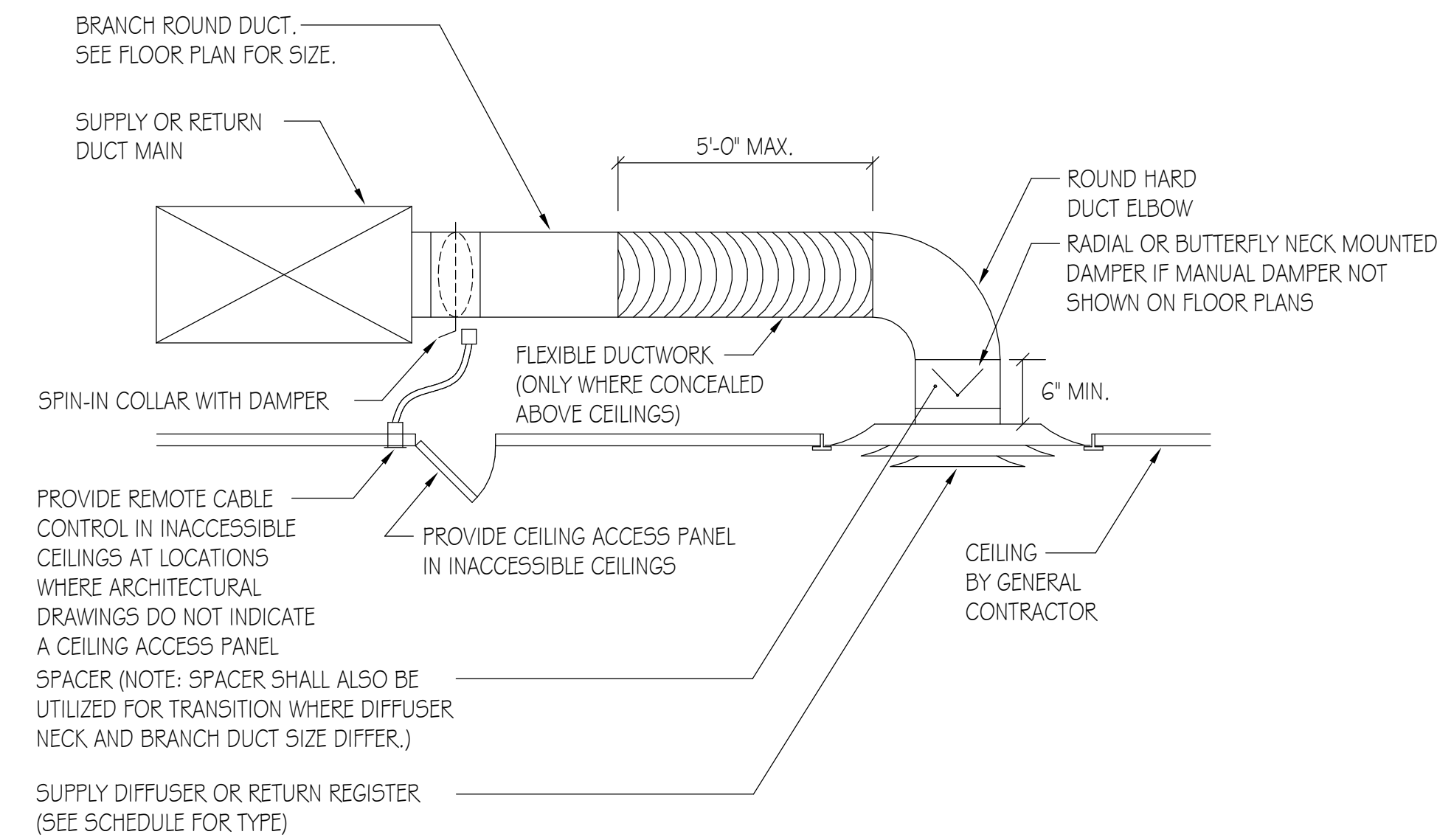
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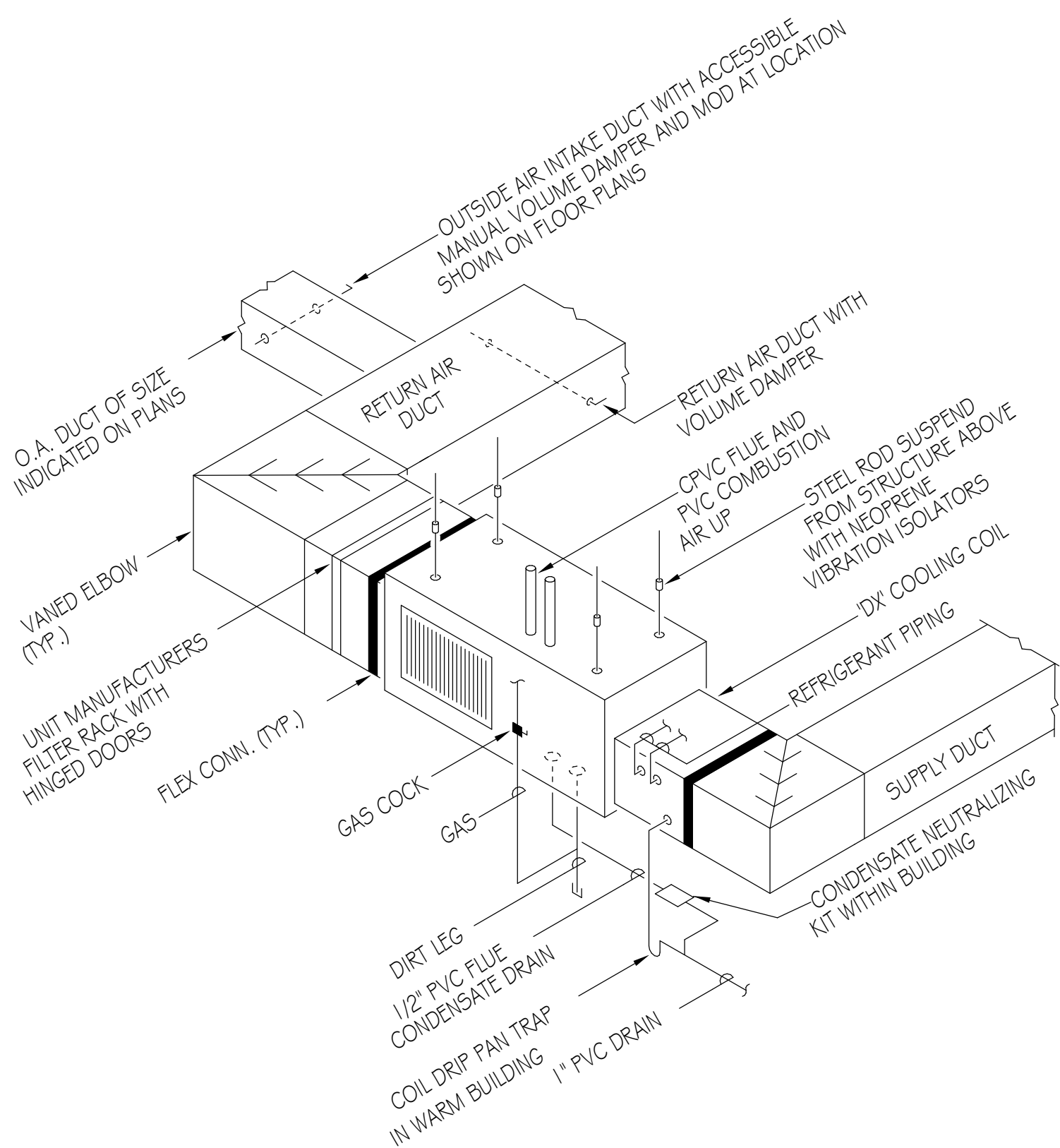
**GAS FIRED UNIT HEATER STANDARD HORIZONTAL VENT  
TERMINAL/COMBUSTION AIR INLET ASSEMBLY**  
NO SCALE



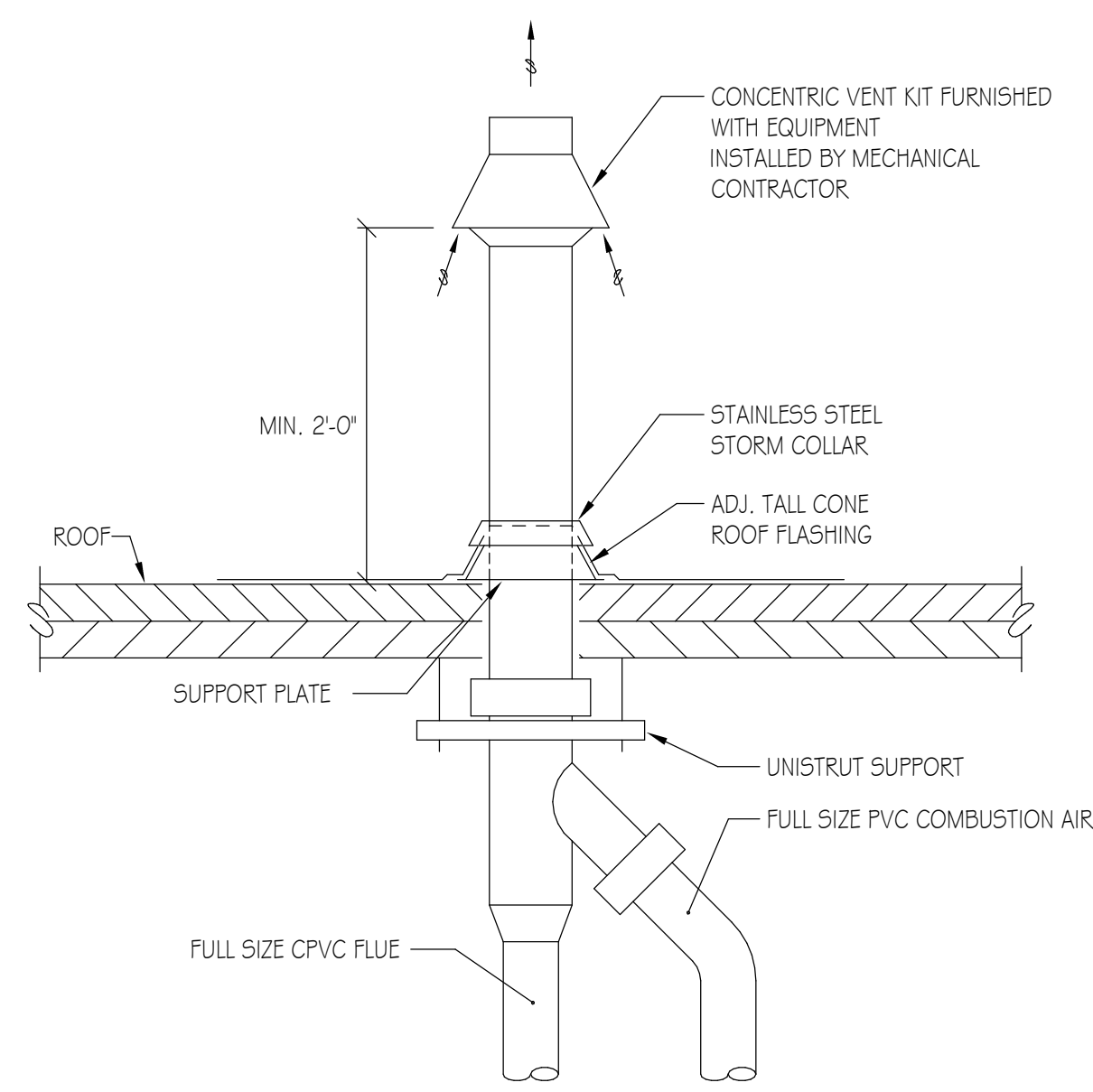
**INTAKE/RELIEF HOOD INSTALLATION DETAIL**  
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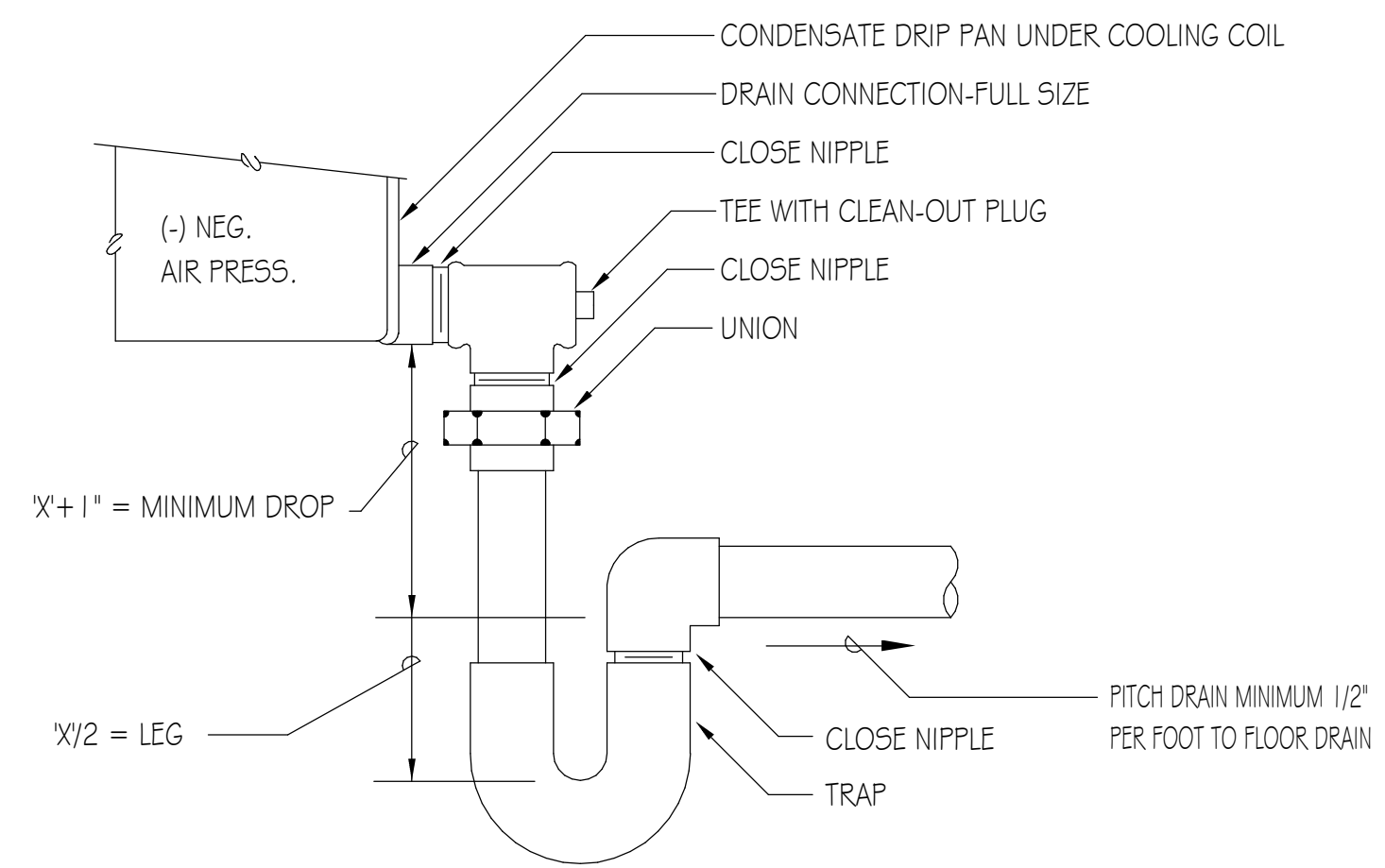
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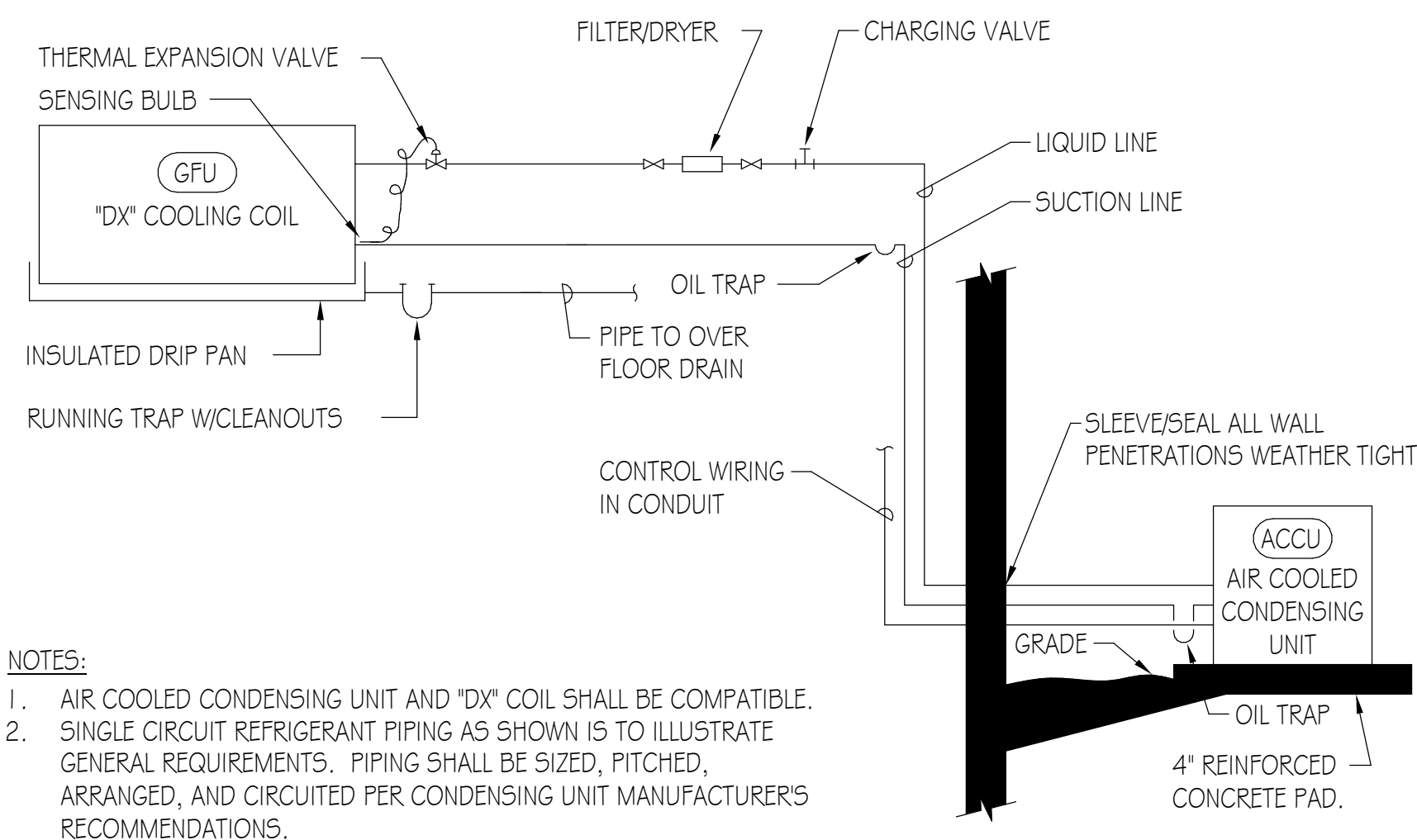
**HORIZONTAL FLOW FURNACE INSTALLATION DETAIL**  
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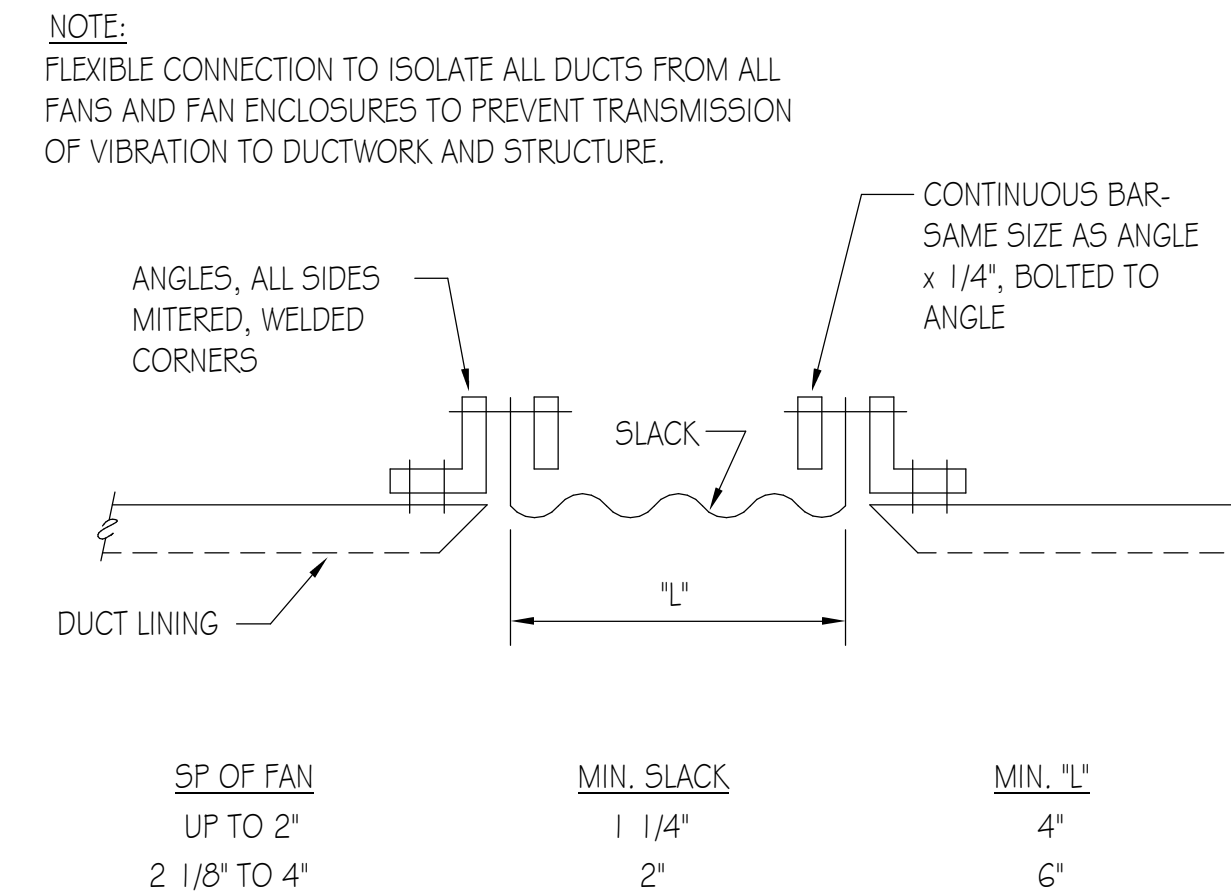
**CONCENTRIC FLUE VENT/COMBUSTION  
AIR STACK THRU ROOF DETAIL**  
NO SCALE



**DRAW-THRU COOLING COIL DRIP PAN DRAIN DETAIL**  
NO SCALE



**REFRIGERANT PIPING DETAIL**  
NO SCALE



**FLEXIBLE CONNECTION**  
NO SCALE

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Fire Station #2 Mechanical Equipment Replacement

Village of Oak Park  
212 Augusta St, Oak Park, IL 60301

**GAS FURNACE UNIT SCHEDULE**

EQUIP TAG	EQUIPMENT LOCATION	AREA SERVED	MANUF.	MODEL	TYPE	APPROXIMATE OVERALL DIMENSIONS (IN.)			AIRFLOW (CFM)	FAN			HEATING SECTION					COOLING SECTION					FILTERS	ELECTRICAL DATA				NOTES					
						L	W	H		MIN. OA (CFM)	ESP (IN.)	TYPE	INPUT (BTUH)	OUTPUT (BTUH)	HEATING STAGES	EAT (°F)	LAT (°F)	EAT (DB °F)	EAT (WB °F)	LAT (DB °F)	LAT (WB °F)	SENSIBLE CAPACITY (MBH)		TOTAL CAPACITY (MBH)	COOLING STAGES	MCA	MOCP		PHASE	VOLT			
						MOTOR				RPM	PHASE	VOLT																					
GFU-1	ATTIC	SECOND FLOOR	CARRIER	59TP6C080	VERTICAL UPFLOW	29.5	17.5	35.0	1600	100	0.50	FC	1050	1	120	80000	78000	2	65.0	110.1	80.0	67.0	60.1	58.3	34.5	44.8	2	1 IN. THICK THROWAWAY	13.1	20	1	120	1,2,3,4,5

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: DAIKIN, TRANE.
  - PROVIDE COMPATIBLE MULTI-POISE A-COIL EVAPORATOR COIL AND HEAT PUMP OUTDOOR UNIT.
  - PROVIDE MANUFACTURER'S CONCENTRIC VENT KIT.
  - PROVIDE WEB-BASED 7-DAY PROGRAMMABLE COLOR TOUCH THERMOSTAT WITH DEMAND CONTROL VENTILATION SEQUENCE AND HEATING/COOLING STAGES TO MATCH INSTALLATION.
  - PROVIDE CONDENSATE NEUTRALIZING KIT.

**ELECTRIC SUSPENDED UNIT HEATER SCHEDULE**

EQUIP TAG	LOCATION	GENERAL			FAN DATA		ELECTRICAL DATA				NOTES
		TYPE	MANUF.	MODEL	TYPE	CFM	HEATER KW	AMP	PH	VOLT	
ESUH-1	BASEMENT	SUSPENDED HORIZONTAL	MARKEL	5100 SERIES	PROP.	400	3.3	13.8	1	240	1,2,3,4,5

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL.
  - DISCONNECT SWITCH.
  - WALL BRACKET.
  - PROVIDE CONTROL RELAY AND TRANSFORMER.
  - PROVIDE WALL MOUNTED THERMOSTAT WITH LOCKING COVER.

**AIR COOLED HEAT PUMP UNIT SCHEDULE**

EQUIP TAG	MANUF.	MODEL	LOCATION	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	WEIGHT (LBS)	COMPRESSORS					FANS				ELECTRICAL DATA				NOTES	
							QUANTITY	SIZE (TONS)	STEPS	SST (°F)	REF. TYPE	EAT (°F)	QUANTITY	TYPE	HP	RPM	MCA	MOCP	PH		VOLT
HP-1	CARRIER	25TPA748A003	ON GRADE	45	47.6	295.0	1	4	2	45	R-410A	95	1	PROP	0.25	1100	33.5	50	1	240	1,2,3

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: SAME AS INDOOR UNIT.
  - PROVIDE ANTI-CYCLE KIT.
  - PROVIDE 5 YEAR COMPRESSOR PARTS WARRANTY.

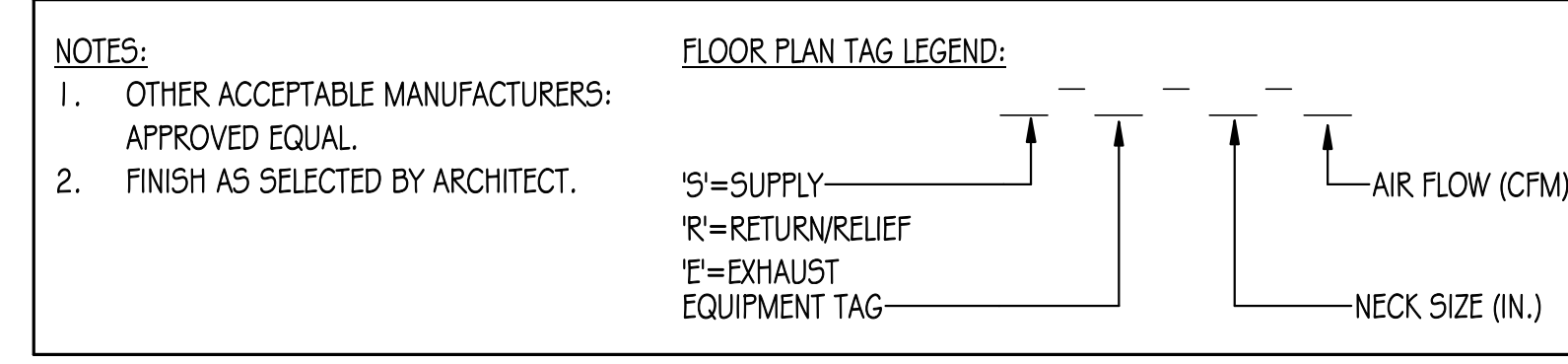
**GAS FIRED UNIT HEATER SCHEDULE**

EQUIP TAG	TYPE	MANUFACTURER	MODEL	DIMENSIONS (IN.)			HEATER				FAN DATA		MOTOR				NOTES
				LENGTH	WIDTH	HEIGHT	INPUT (MBH)	OUTPUT (MBH)	STAGES	FLUE DIA. (IN.)	FAN TYPE	CFM	RPM	HP	PHASE	VOLT	
GUH-1	SEPARATED COMBUSTION	REZNOR	UDXC-75	31 29/32"	27"	16 3/4"	75	62.25	1	4	PROP	960	1550	0.06	1	120	1,2,3
GUH-2	SEPARATED COMBUSTION	REZNOR	UDXC-75	31 29/32"	27"	16 3/4"	75	62.25	1	4	PROP	960	1550	0.06	1	120	1,2,3

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL.
  - INCLUDE OPTIONAL 409 STAINLESS STEEL HEAT EXCHANGER, SINGLE STAGE GAS VALVE AND THERMOSTAT WITH LOCKING COVER.
  - MANUFACTURER'S CONCENTRIC VENT KIT.

**DIFFUSER, REGISTER, AND GRILLE SCHEDULE**

TAG	MANUFACTURER	MODEL	TYPE	NOMINAL FACE SIZE	MATERIAL	MAX. N.C.	NOTES
A	TITUS	OMNI	SQUARE PANEL FACE	24"x24"	STEEL	30	1,2



**INTAKE AND RELIEF HOOD SCHEDULE**

EQUIP TAG	LOCATION	EQUIPMENT SERVED	MANUF.	MODEL	TYPE	THROAT SIZE			CFM	STATIC PRESSURE (IN. W.G.)	HOOD FREE AREA (SQFT)	MAX. THROAT VELOCITY (FPM)	NOTES
						DIA	H	W					
IH-1	ROOF	GFU-1	GREENHECK	GRSI-08	INTAKE	8"			100	0.01	0.3	287	1,2

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL.
  - MANUFACTURER'S STANDARD SLOPED ROOF CURB, VERIFY SLOPE OF ROOF PRIOR TO PLACING ORDER.

**ELECTRIC FINNED TUBE SCHEDULE**

EQUIP TAG	LOCATION	GENERAL		TYPE/MATERIAL	ENCLOSURE			MOUNTING HEIGHT (MIN. AFF)	ELEMENT					NOTES
		MANUF.	MODEL		LENGTH	HEIGHT	WIDTH		WATTS	CAPACITY (BTUH)	AMP	PH	VOLT	
EFT-1	FIRST FLOOR TOILET	MARKEL	3700 SERIES	ALUMINUM BASEBOARD	48"	9"	3"	6"	1,000	3,412	8.3	1	120	1,2,3,4

- NOTES:**
- OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL.
  - FIELD MEASURE ALL LENGTHS PRIOR TO FABRICATION. COLOR FINISH TO BE SELECTED BY ARCHITECT.
  - PROVIDE 6" CONTROL SECTION, END TRIMS, AND END CLOSURES.
  - TAMPER-PROOF BUILD-IN DISCONNECT SWITCH AND INTEGRAL THERMOSTAT.

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**HVAC Schedules**

**HV3.00**

**DRAWING NOTES**

- 1 ELECTRICALLY DISCONNECT EXISTING EQUIPMENT FOR REMOVAL. REMOVE ANY ASSOCIATED FIRE ALARM DEVICES, DISCONNECT SWITCHES, STARTERS, AND ALL CONDUITS AND CONDUCTORS BETWEEN UNIT AND PANEL. LEAVE CIRCUIT BREAKER AT 'OFF' POSITION AND INDICATE CIRCUIT AS 'SPARE' IN PANELBOARD DIRECTORY.
- 2 CAREFULLY DISCONNECT EXISTING IONIZER DEVICE TO ACCOMMODATE REMOVAL OF EXISTING EQUIPMENT. PROTECT DEVICE FOR REUSE AND REINSTALLATION.



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**ENGINEERING GROUP LLC**

**Fire Station #2 Mechanical Equipment Replacement**

**Village of Oak Park**  
 212 Augusta St, Oak Park, IL 60301

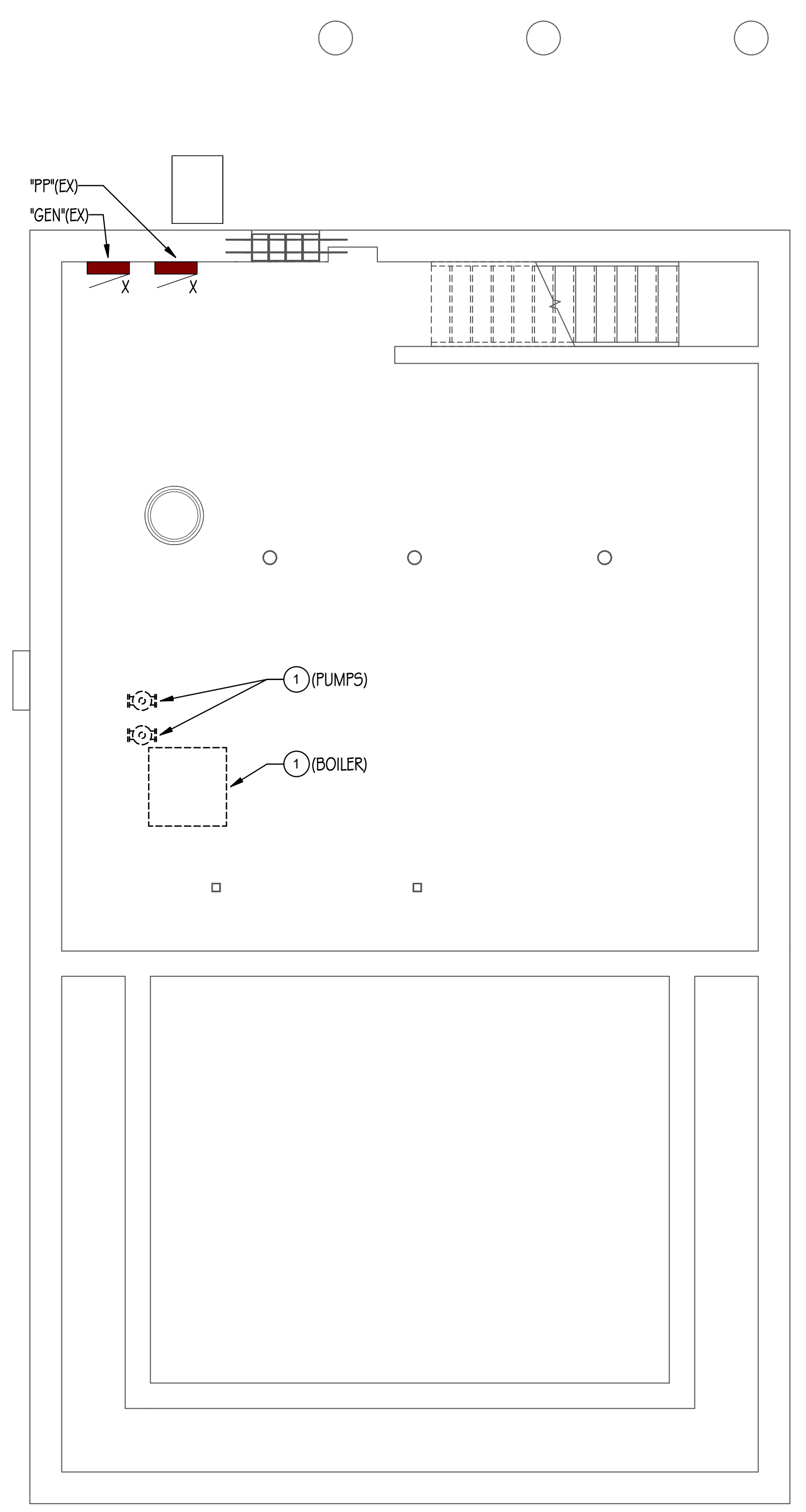
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**Electrical Demolition Plans**

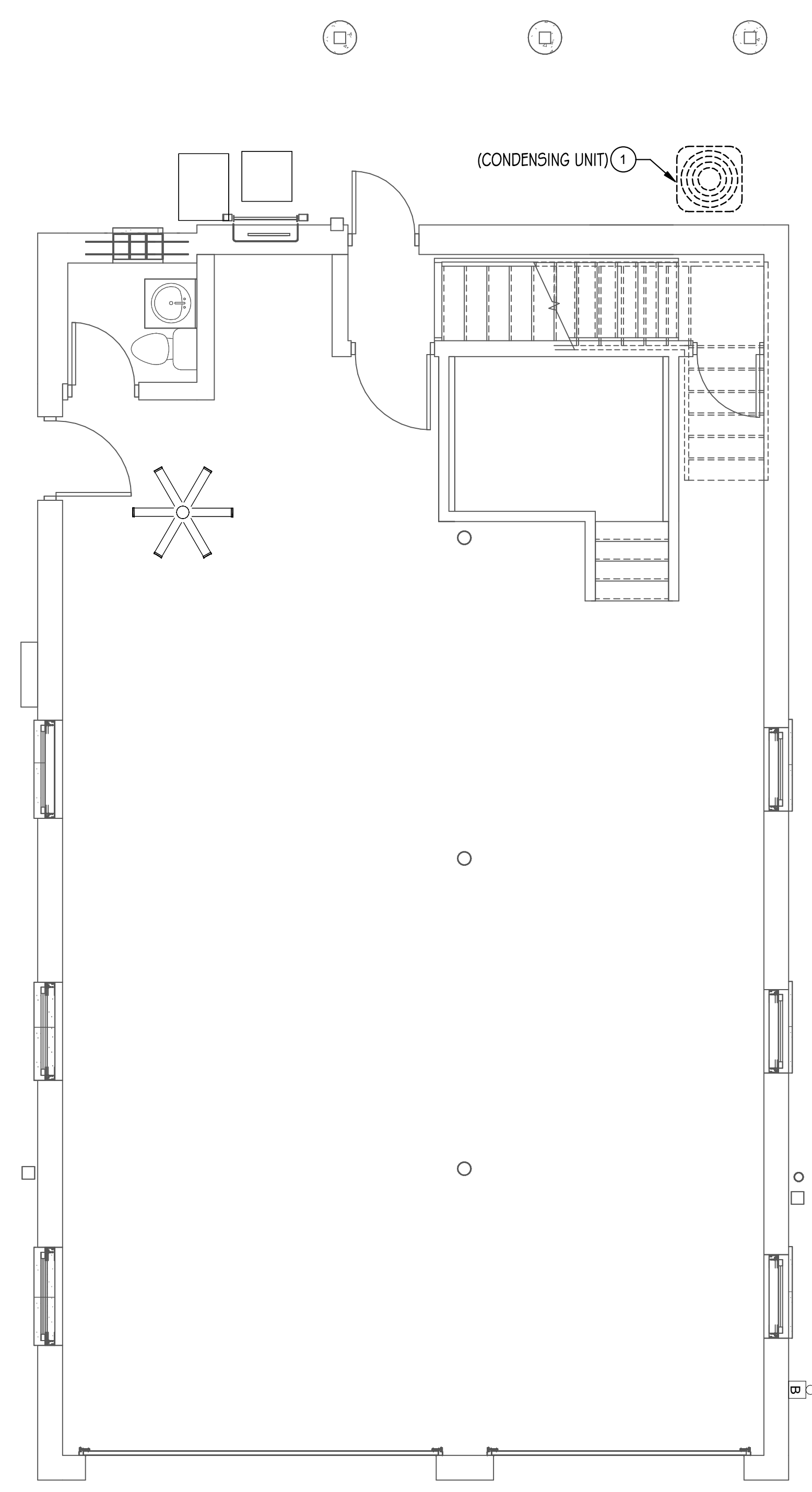
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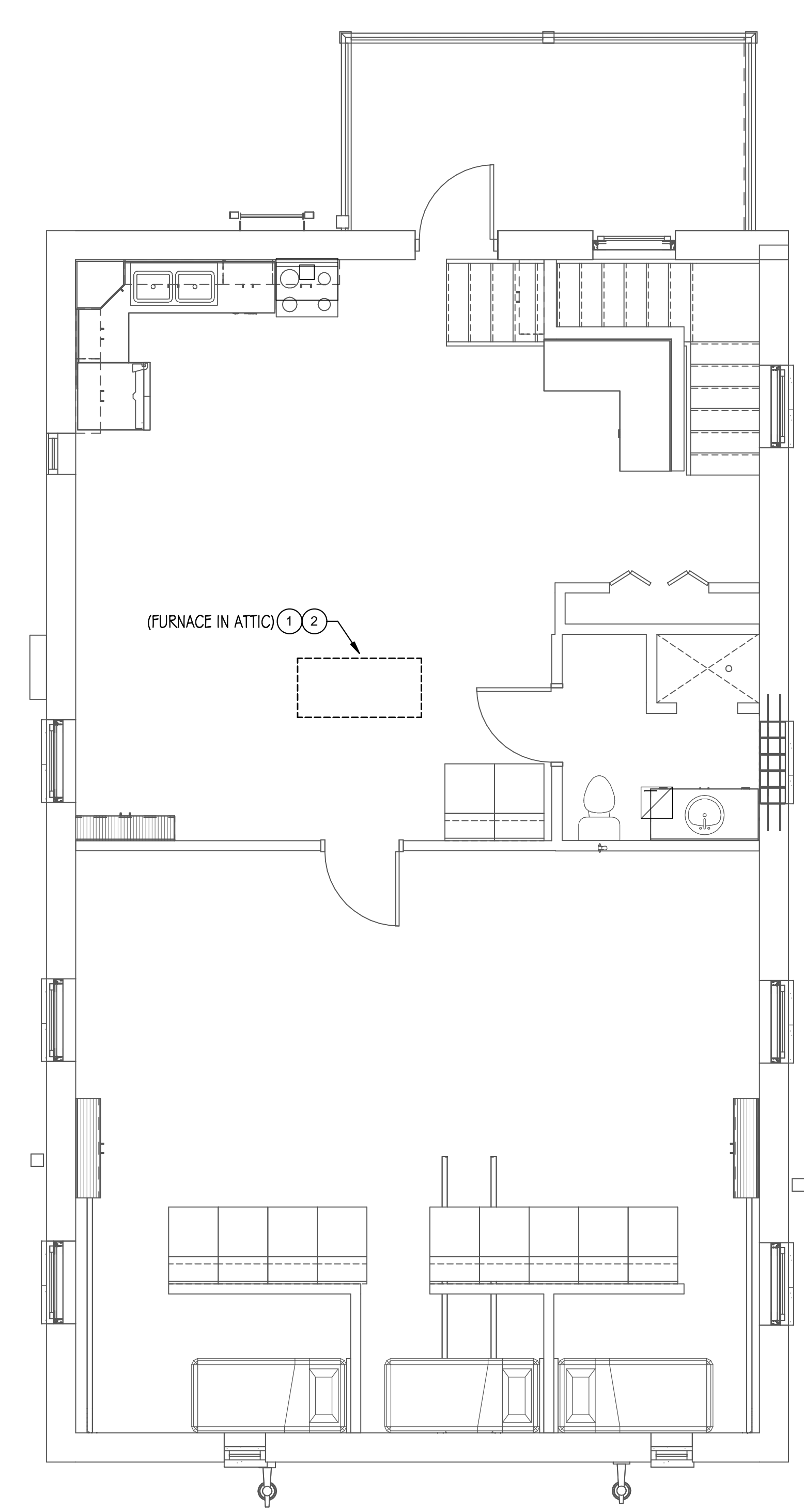
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① BASEMENT ELECTRICAL DEMOLITION PLAN  
 1/4" = 1'-0"



② FIRST FLOOR ELECTRICAL DEMOLITION PLAN  
 1/4" = 1'-0"



③ SECOND FLOOR ELECTRICAL DEMOLITION PLAN  
 1/4" = 1'-0"



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**DRAWING NOTES**

- 1 DISCONNECT SWITCH FURNISHED WITH EQUIPMENT, WIRED BY ELECTRICAL CONTRACTOR.
- 2 PROVIDE 120VAC, 20AMP, MOTOR RATED TOGGLE DISCONNECT SWITCH FOR MECHANICAL EQUIPMENT. COORDINATE EXACT LOCATION WITH OTHERS.
- 3 PROVIDE 240VAC, 2-POLE, 60AMP RATED NON-FUSIBLE DISCONNECT SWITCH IN NEMA 3R ENCLOSURE. COORDINATE EXACT LOCATION OF MECHANICAL EQUIPMENT WITH OTHERS TO MAINTAIN 3-FOOT WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT.
- 4 REUSE AND REINSTALL EXISTING IONIZER DEVICE ON NEW EQUIPMENT. EXTEND EXISTING CONDUITS AND CONDUCTORS TO NEW DEVICE LOCATION AS REQUIRED. COORDINATE INSTALLATION WITH OTHERS FOR A COMPLETE AND OPERABLE SYSTEM.
- 5 PROVIDE SINGLE GANG BACKBOX AND CONDUIT WITH PULL STRING ROUTED TO ASSOCIATED EQUIPMENT FOR THERMOSTAT/CARBON DIOXIDE DETECTOR, MOUNTED 48" A.F.F. UNLESS NOTED OTHERWISE. COORDINATE EXACT LOCATION WITH OTHER TRADES PRIOR TO ROUGH-IN.

**Fire Station #2 Mechanical Equipment Replacement**

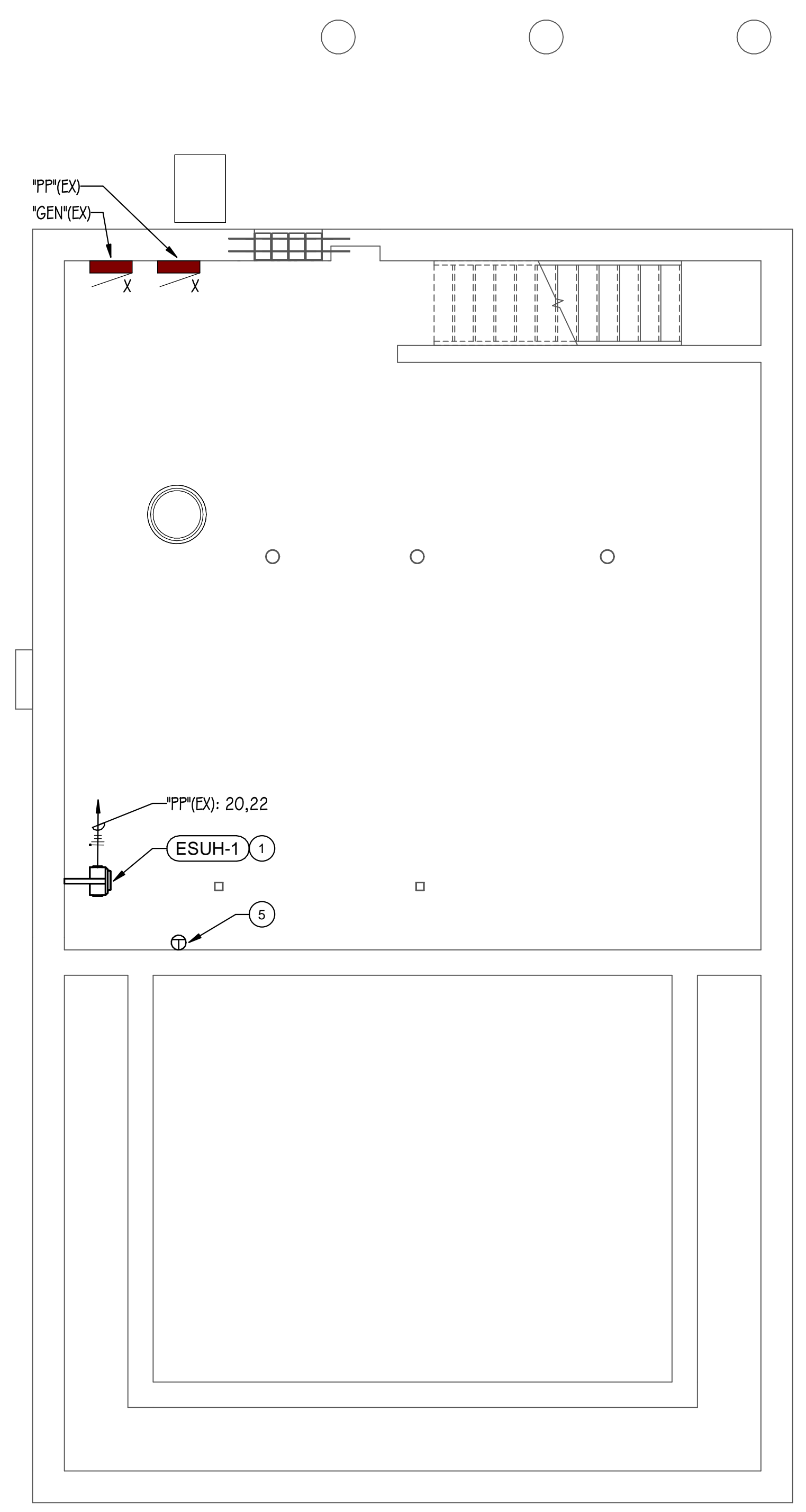
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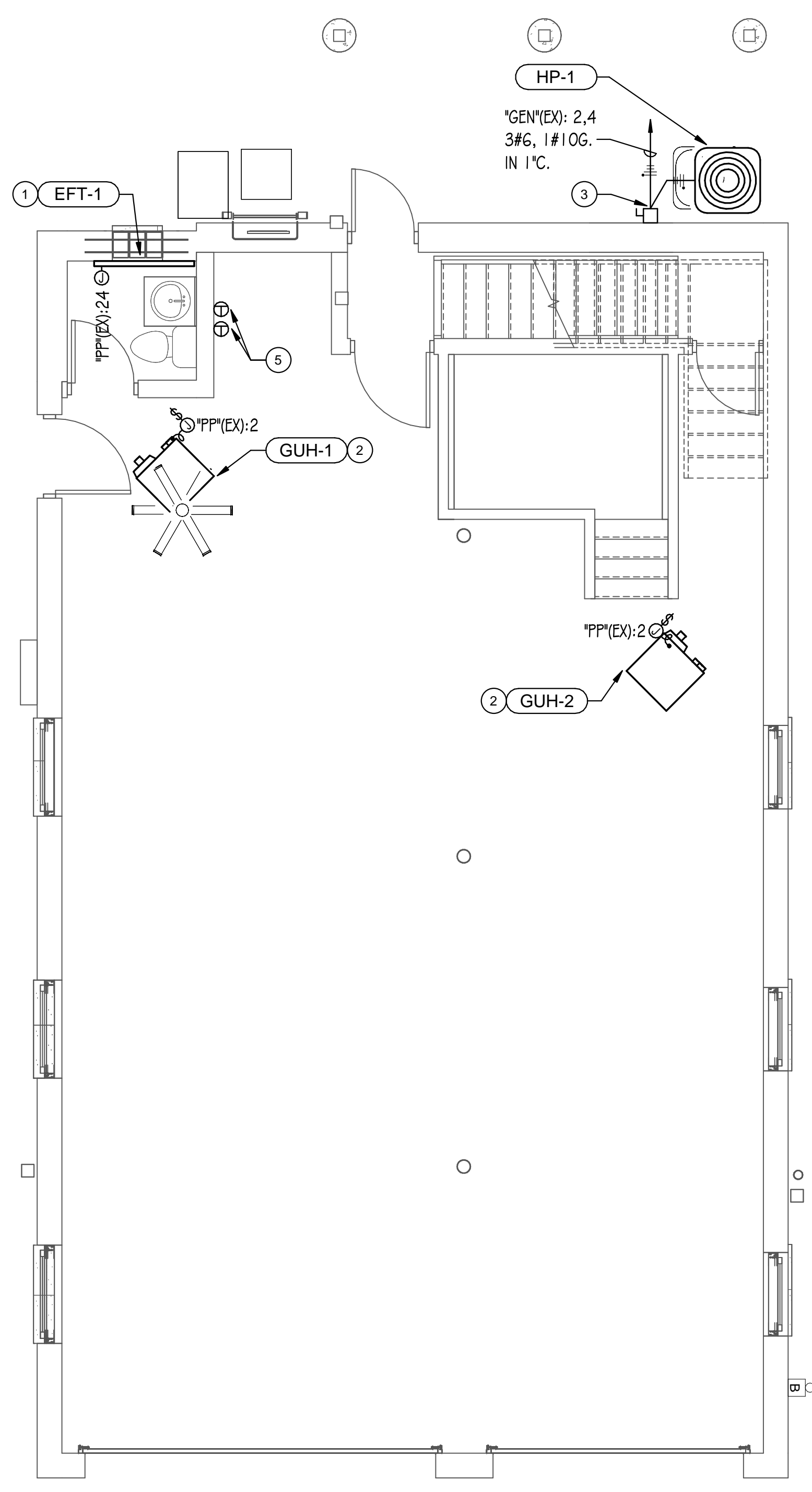
**Electrical Plans**

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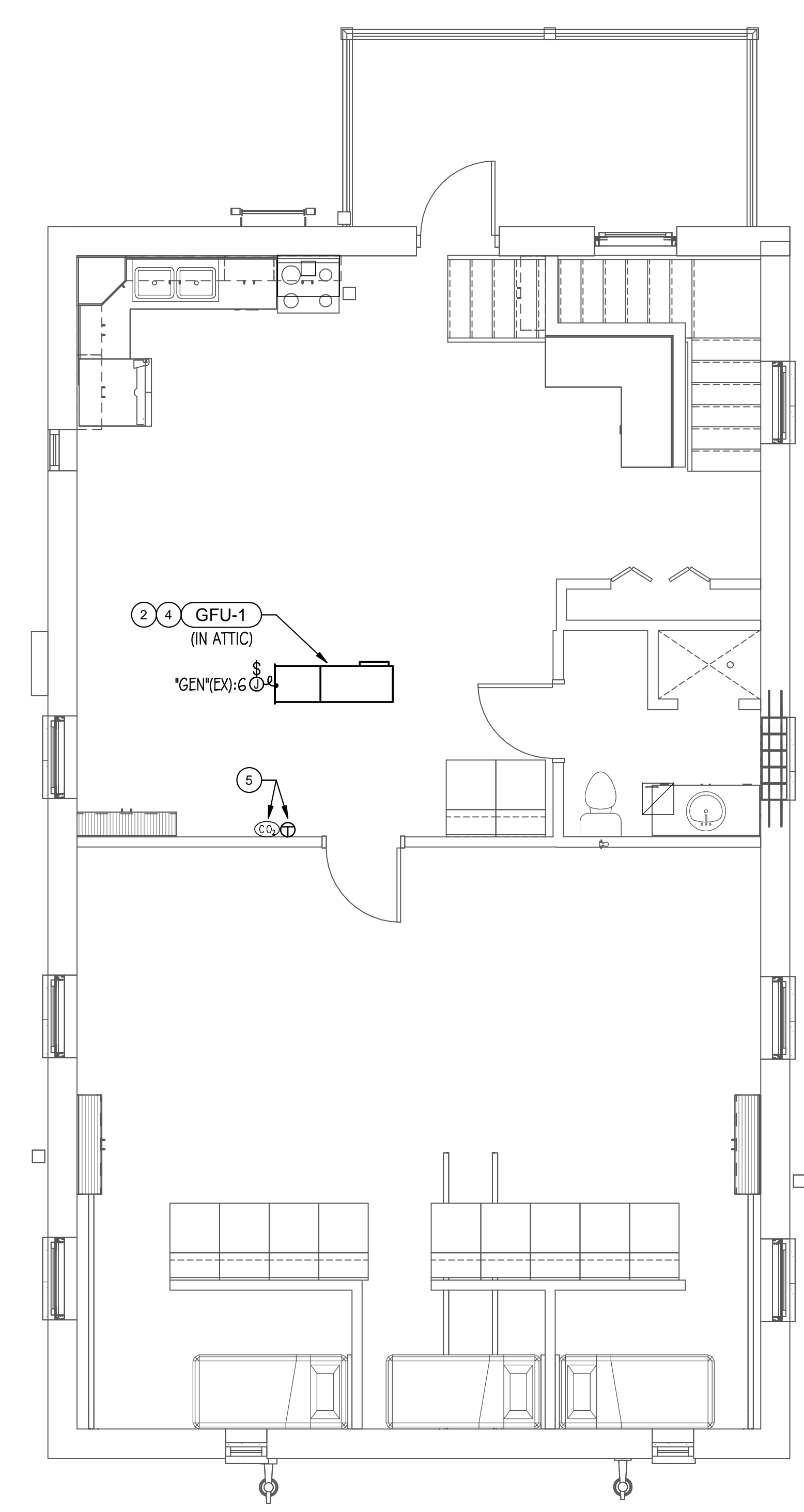
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① BASEMENT ELECTRICAL PLAN  
 1/4" = 1'-0"



② FIRST FLOOR ELECTRICAL PLAN  
 1/4" = 1'-0"



③ SECOND FLOOR ELECTRICAL PLAN  
 1/4" = 1'-0"

**ELECTRICAL SERVICE LOAD CALCULATION:**

EXISTING ELECTRICAL SERVICE SIZE	200	AMP
EXISTING LOADS		
PEAK DEMAND LOAD IN 08/2023 PER COMMONWEALTH EDISON ASSUME 0.85 POWER FACTOR	9.52 11200 X 1.25	KW VA VA
TOTAL EXISTING LOAD AMPERES @ 240V-1PH.	14000 58.3	VA AMPS
REMOVED HVAC LOADS		
(1) CONDENSING UNIT	5832	VA
(1) FURNACE	3240	VA
TOTAL REMOVED LOAD	9072	VA
NEW HVAC LOADS		
'GFU-1'	1572	VA
'HP-1'	8040	VA
'ESUH-1'	3300	VA
'GUH-1' / 'GUH-2'	500	VA
25% OF LARGEST MOTOR	2010	VA
TOTAL NEW LOAD	15422	VA
TOTAL COMBINED EXISTING, REMOVED, AND NEW LOADS	20350	VA
AMPERES @ 240V-1PH.	84.8	AMPS

PANEL SCHEULE: "GEN"(EX)				LOCATION:				C.B. RATING: VIF KAIC							
VOLT: 240/120V, 1Ø, 3W				MAINS: 100 A MLO				MOUNTING: SURFACE				TYPE: BOLT-ON			
REMARKS: EXISTING PANEL MANUFACTURED BY 'SIEMENS'.															
V.A.															
USE AND/OR AREA SERVED	C/B	CIR. NO.	A	B	CIR. NO.	C/B	USE AND/OR AREA SERVED	C/B	CIR. NO.	A	B				
	--	1			--				--						
	--	3	4020		2	2P 50 A	Δ M: HP-1		--						
	--	5		4020	4				--						
	--	7	1772		6	1P 20 A	Δ M: GFU-1		--						
	--	9			8				--						
	--	11			10				--						
	--	13			12				--						
	--	15			14				--						
	--	17			16				--						
	--	19			18				--						
	--				20				--						
TOTAL CONNECTED LOAD PER PHASE:			5541	4020	TOTAL =		9,517 VA								
							39.65	AMPS							

Δ - PROVIDE NEW CIRCUIT BREAKER OF TYPE AND AIC RATING TO MATCH EXISTING PANEL. UTILIZE AVAILABLE BUSSED SPACE FOR INSTALLATION OF NEW CIRCUIT BREAKER.

PANEL SCHEULE: "PP"(EX)				LOCATION:				C.B. RATING: VIF KAIC							
VOLT: 240/120V, 1Ø, 3W				MAINS: 200 A MCB				MOUNTING: SURFACE				TYPE: BOLT-ON			
REMARKS: EXISTING PANEL MANUFACTURED BY 'GENERAL ELECTRIC'.															
V.A.															
USE AND/OR AREA SERVED	C/B	CIR. NO.	A	B	CIR. NO.	C/B	USE AND/OR AREA SERVED	C/B	CIR. NO.	A	B				
	--	1			--				--						
	--	3	500		2	1P 20 A	Δ M: GUH-1 / GUH-2		--						
	--	5			4				--						
	--	7			6				--						
	--	9			8				--						
	--	11			10				--						
	--	13			12				--						
	--	15			14				--						
	--	17			16				--						
	--	19			18				--						
	--				20				--						
	--	21			20	2P 20 A	Δ M: ESUH-1		--						
	--	23			22				--						
	--	25		1000	24	1P 20 A	Δ M: EFT-1		--						
	--	27			26				--						
	--	29			28				--						
	--	31			30				--						
	--	33			32				--						
	--	35			34				--						
	--	37			36				--						
	--	39			38				--						
	--				40				--						
TOTAL CONNECTED LOAD PER PHASE:			2150	2522	TOTAL =		4,639 VA								
							19.33	AMPS							

Δ - PROVIDE NEW CIRCUIT BREAKER OF TYPE AND AIC RATING TO MATCH EXISTING PANEL. UTILIZE AVAILABLE BUSSED SPACE FOR INSTALLATION OF NEW CIRCUIT BREAKER.

**PANEL SCHEDULE NOTE:**

SCHEDULES FOR EXISTING PANELS ARE SHOWN FOR REFERENCE TO INDICATE SIZE AND QUANTITY OF NEW CIRCUIT BREAKERS REQUIRED. CONTRACTOR TO FIELD VERIFY EXISTING PANEL CHARACTERISTICS AND BRANCH CIRCUIT BREAKER LAYOUT.



Fire Station #2 Mechanical Equipment Replacement

Village of Oak Park  
212 Augusta St, Oak Park, IL 60301

NO	ISSUE	DATE
.	OUT FOR BID	4/03/2024
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Electrical Schedules

E2.00

DEMOLITION SYMBOLS	
SYMBOL	DESCRIPTION
X	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO REMAIN.
R	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE REMOVED.
XRR	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE REMOVED, RELOCATED AND JUNCTION BOX REMOVED OR CAPPED AS REQUIRED. STORE AND PROTECT EXISTING DEVICE FOR RE-USE AND RE-INSTALLATION.
XR	EXISTING ELECTRICAL EQUIPMENT OR OUTLET RELOCATED (NEW LOCATION). EXTEND EXISTING FEED AS REQUIRED TO MAINTAIN DEVICE/EQUIPMENT OPERATION. PROVIDE NEW FEED OF MATCHING SPECIFICATIONS IN SITUATIONS WHERE THEY CANNOT BE SPLICED OR ARE NOT OF SUFFICIENT LENGTH TO REACH NEW LOCATION.
XC	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE REMOVED AND JUNCTION BOX CAPPED OR REUSED AS REQUIRED.
XO	NEW ELECTRICAL EQUIPMENT INSTALLED OVER EXISTING OUTLET.
XA	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE ABANDONED.
XM	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE MODIFIED.
XW	EXISTING ELECTRICAL EQUIPMENT TO BE REWIRED.
XRT	EXISTING ELECTRICAL EQUIPMENT OR OUTLET TO BE TEMPORARILY REMOVED AND REINSTALLED IN SAME LOCATION.

NOTE: NOT ALL SYMBOLS ARE USED ON THIS PROJECT.

**GENERAL NOTES:**

- CONTRACTOR SHALL MAINTAIN FIRE RATING OF ALL PARTITIONS FOR NEW PENETRATIONS. ANY PENETRATIONS THROUGH WALLS AND FLOORS SHALL BE PROPERLY SEALED AND TREATED TO MAINTAIN THE FIRE STOPPING RATING OF THE WALL. CABLING SHALL NOT PENETRATE WALLS UNLESS ROUTED THROUGH RACEWAY SYSTEM OR ROUTED ABOVE ACCESSIBLE CEILINGS THROUGH METALLIC CONDUIT SLEEVES, EXTENDING A MINIMUM OF 6" EACH SIDE OF THE WALL WITH PROTECTIVE END BUSHINGS TO PREVENT DAMAGE TO CABLES. VOIDS AROUND SLEEVES SHALL BE SEALED WITH APPROPRIATE MATERIALS AS TO MAINTAIN THE ACOUSTIC OR FIRE RATING OF WALLS ABOVE AND BELOW CEILINGS. CABLES RAN THROUGH VOIDS WITHOUT SLEEVES OR RACEWAYS WILL NOT BE ACCEPTABLE. CONTRACTOR SHALL VERIFY EXISTING FIRE PARTITIONS IN THE FIELD.
- INCIDENTAL WORK MAY ALSO BE NECESSARY DUE TO CHANGES AFFECTING, FIRE ALARM, ELECTRICAL, OR OTHER SYSTEMS. SUCH INCIDENTAL WORK IS ALSO PART OF THIS CONTRACT. INSPECT THOSE AREAS, ASCERTAIN WORK NEEDED, AND DO THAT WORK IN ACCORD WITH THE CONTRACT REQUIREMENTS, AT NO ADDITIONAL COST. THE REMOVAL & REINSTALLATION OF EXISTING WORK TO ACCOMMODATE CHANGES TO EXISTING, OR INSTALLATION OF, ELECTRICAL, OTHER SYSTEMS IS ALSO PART OF THIS CONTRACT.
- EXISTING CONDITIONS WERE OBTAINED FROM EXISTING AS-BUILT DRAWINGS AND CURSORY FIELD OBSERVATION. THIS CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES IN THE FIELD AND REPORT THEM TO THE ENGINEER.

**BIDDING NOTE:**

SEE DRAWINGS ME1.00 FOR GENERAL NOTES AND ADDITIONAL DETAILS APPLICABLE TO THIS TRADE'S WORK.

**ELECTRICAL SYMBOL LIST** (NOTE: NOT ALL SYMBOLS ARE USED IN THE PROJECT.)

- (GFI,USB,WPI) 20A. 2P, 3 WIRE, GROUNDING TYPE, 125V. SPECIFICATION-GRADE, TAMPER-RESISTANT TYPE DUPLEX RECEPTACLE NEMA 5-20R INSTALLED + 16" A.F.F. UNLESS NOTED OTHERWISE.  
- "GFI" DENOTES RECEPTACLE EQUIPPED WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER.  
- "USB" DENOTES RECEPTACLE EQUIPPED WITH (2) USB PORTS.  
- "WP" DENOTES WEATHER-RESISTANT RECEPTACLE WITH LOW-PROFILE WHILE-IN-USE WEATHERPROOF COVER.
- (GFI,USB) 20A. 2P, 3 WIRE, GROUNDING TYPE, 125V. SPECIFICATION-GRADE, TAMPER-RESISTANT TYPE DUPLEX RECEPTACLE NEMA 5-20R INSTALLED 6" ABOVE COUNTER TOP OR +42" A.F.F. UNLESS NOTED OTHERWISE.  
- "GFI" DENOTES RECEPTACLE EQUIPPED WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER.  
- "USB" DENOTES RECEPTACLE EQUIPPED WITH (2) USB PORTS.
- (GFI,USB) TWO 20A. 2P, 3 WIRE, GROUNDING TYPE, SPECIFICATION-GRADE, TAMPER-RESISTANT TYPE DUPLEX RECEPTACLES NEMA 5-20R INSTALLED + 16" A.F.F. UNLESS NOTED OTHERWISE.  
- "GFI" DENOTES RECEPTACLE EQUIPPED WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER.  
- "USB" DENOTES RECEPTACLE EQUIPPED WITH (2) USB PORTS.
- CIRCUIT BREAKER PANELBOARD.
- NON-FUSED SAFETY DISCONNECT SWITCH, AMPERE RATING AND NUMBER OF POLES AS NOTED.
- FUSED DISCONNECT SWITCH, AMPERE RATING, NUMBER OF POLES AND FUSE SIZE AS NOTED.
- MANUAL MOTOR STARTER, THERMAL OVERLOAD TOGGLE SWITCH.
- CEILING JUNCTION BOX.
- WALL MOUNTED JUNCTION BOX.
- JUNCTION BOX WITH FLEXIBLE CONDUIT FOR FINAL CONNECTION TO EQUIPMENT.
- THERMOSTAT, PROVIDE RECESSED JUNCTION BOX AND CONDUIT STUB-UP, REFER TO MECHANICAL FOR EXACT QUANTITY AND LOCATION.
- CO2 SENSOR, PROVIDE RECESSED JUNCTION BOX AND CONDUIT STUB-UP, REFER TO MECHANICAL FOR EXACT QUANTITY AND LOCATION.
- CONDUIT ROUTED CONCEALED IN WALLS AND CEILING. HASH MARKS DENOTE QUANTITY OF #12 MINIMUM AWG CONDUCTORS OR AS NOTED.
- CONDUIT ROUTED EXPOSED. INSTALL PARALLEL TO WALLS AND CEILINGS. HASH MARKS DENOTE QUANTITY OF #12 MINIMUM AWG CONDUCTORS OR AS NOTED.
- DENOTES CONDUIT HOMERUN, 3/4" MINIMUM, PANEL DESTINATION AND CIRCUIT NUMBER(S) AS INDICATED.
- SHORT TICK MARK DENOTES LINE (HOT) OR SWITCH LEG CONDUCTOR, #12 MINIMUM AWG.
- LONG TICK MARK DENOTES NEUTRAL CONDUCTOR, #10 AWG MINIMUM.
- DENOTES INSULATED GROUND WIRE, #12 AWG MINIMUM.

**ELECTRICAL SPECIFICATIONS**

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE 2020 NATIONAL ELECTRICAL CODE WITH VILLAGE OF OAK PARK AMENDMENTS.
- PROVIDE ALL PERMITS AND INSPECTION FEES.
- ALL MATERIAL AND LABOR SHALL BE GUARANTEED FOR ONE YEAR AFTER FINAL ACCEPTANCE BY THE OWNER.
- CONTRACTOR SHALL PROVIDE ALL THEIR OWN RIGGING, SCAFFOLDING, RUBBISH REMOVAL, AND LEAVE SPACE BROOM CLEAN.
- MINIMUM SIZE CONDUIT SHALL BE 3/4" EMT, PROVIDE IMC FOR CONDUITS 2" AND LARGER OR WHERE EXPOSED TO WET OR DAMP LOCATIONS. EMT FITTINGS SHALL BE COMPRESSION TYPE. IMC SHALL HAVE THREADED CONNECTIONS. TRANSITION TO LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR FINAL CONNECTION (MAXIMUM LAST 6 FEET) OF CONDUCTORS SERVING EQUIPMENT SUBJECT TO VIBRATION.
- MINIMUM SIZE CONDUCTOR SHALL BE #12 THHN, OR THWN WHERE REQUIRED, WITH #14 USED FOR CONTROL WIRING. CONDUCTOR MATERIAL SHALL BE COPPER ONLY.
- PROVIDE SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR WITHIN EACH FEEDER AND BRANCH CIRCUIT RACEWAY. TERMINATE EACH END ON SUITABLE LUG, BUS, OR BUSHING.
- BRANCH CIRCUIT CONDUCTORS FOR 20 AMP RECEPTACLES AND LIGHTING CIRCUITS SHALL BE ADJUSTED FOR VOLTAGE DROP:
  - A. 120/208V: 0-75' - #12AWG MINIMUM  
75'-150' - #10AWG MINIMUM  
150'-225' - #8AWG MINIMUM
  - B. 277/480V: 0-100' - #12AWG MINIMUM  
100'-200' - #10AWG MINIMUM  
200'-300' - #8AWG MINIMUM
- CONDUCTOR SIZES #14 AWG, #12 AWG, AND #10 AWG SHALL BE SOLID. CONDUCTOR SIZES #8 AWG AND LARGER SHALL BE STRANDED. ALL CONDUCTORS SHALL BE COLOR CODED.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY CUTTING AND PATCHING INCLUDING SLEEVES AND INSERTS.
- THE COLOR AND FINISH OF ALL MATERIALS SHALL BE SUBJECT TO REVIEW AND APPROVAL OF OWNER OR ENGINEER. PROVIDE SHOP DRAWINGS REQUIRED FOR FINISH AND COLOR SELECTION.
- ALL NEW CIRCUIT BREAKERS SHALL BE BOLT-ON BREAKERS COMPATIBLE WITH EXISTING PANELBOARD. PROVIDE TYPEWRITTEN DIRECTORIES IN ALL PANELS.
- BEFORE SUBMITTING THEIR BID, CONTRACTOR SHALL VISIT THE SITE TO ASCERTAIN ALL WORK INVOLVED IN THE PROJECT.
- CONTRACTOR SHALL COORDINATE THEIR WORK WITH OTHER CONTRACTORS ON THE PROJECT.
- CONTRACTOR SHALL MAKE NECESSARY MODIFICATIONS AND ADJUSTMENTS TO ALL ELECTRICAL ITEMS AND EQUIPMENT AS MAY BE REQUIRED BY THIS WORK.
- ALL ELECTRICAL EQUIPMENT MUST MAINTAIN WORKING CLEARANCES AS REQUIRED BY NEC.
- FLEXIBLE RACEWAY SYSTEMS SHALL NOT BE USED TO PENETRATE ROOFS, FLOORS, OR AIRMOISTURE BARRIERS.
- RACEWAY SYSTEMS SHALL NOT BE ROUTED THROUGH OR IN HVAC DUCTS.
- CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL CORING, CUTTING, PATCHING, REPAIRING, REFINISHING, AND REMOVAL/REPLACEMENT OF NEW OR EXISTING BUILDING CONSTRUCTION REQUIRED TO ACCOMMODATE THE INSTALLATION OR REMOVAL OF THEIR WORK. REMOVE, STORE, AND REINSTALL CEILING TILES AS REQUIRED TO INSTALL WORK ABOVE EXISTING REMOVABLE CEILINGS WHICH REMAIN; REPLACE TILES BROKEN OR DAMAGED DURING CONSTRUCTION. ALL PATCHING, REPAIRING, AND REFINISHING WORK TO OTHER FINISHES AND STRUCTURAL ELEMENTS SHALL BE PERFORMED BY THOSE REGULARLY INVOLVED IN THAT TRADE AND SHALL MATCH THE ADJACENT CONSTRUCTION AS CLOSELY AS POSSIBLE WHILE MAINTAINING EXISTING FIRE RATINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXISTING FIRE RATINGS OF CEILINGS AND PARTITIONS SYSTEMS. CARE SHALL BE TAKEN SO AS NOT TO DAMAGE ANY EXISTING BUILDING CONSTRUCTION OR ITEMS THAT ARE TO REMAIN. ANY EXISTING FINISHES THAT ARE DAMAGED DURING THE INSTALLATION OF NEW WORK OR REMOVAL OF EXISTING WORK SHALL BE REPAIRED, REPLACED, AND PAID FOR BY THE INSTALLING CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT AND OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR EXISTING BUILDING CONSTRUCTION THAT IS TO REMAIN AND, THEREFORE, SUBJECT TO PATCHING, REPAIRING, REFINISHING, AND REMOVAL/REPLACEMENT.
- ALL PENETRATIONS THROUGH EXTERIOR WALL SHALL BE SEALED WATER TIGHT PER ARCHITECT'S REQUIREMENTS.
- DISCONNECTS  
ACCEPTABLE MANUFACTURERS: EATON, SQUARE D, OR SIEMENS  
  
THE CONTRACTOR SHALL FURNISH AND INSTALL ALL FUSIBLE OR NON-FUSIBLE DISCONNECT SWITCHES AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.  
  
PROVIDE HEAVY DUTY, KNIFE SWITCH TYPE DISCONNECT SWITCHES FOR ALL ELECTRICALLY OPERATED EQUIPMENT NEMA RATED FOR SIZE AND LOCATION. DISCONNECT SWITCHES SHALL BE PLENUM RATED OR WEATHERPROOF WHERE REQUIRED. HANDLE SHALL BE LOCKABLE IN THE 'OFF' POSITION. PROVIDE A PLASTIC LAMINATE INSCRIPTION PLATE WITH RIVETS FOR IDENTIFICATION. (PULLOUT SWITCHES ARE NOT APPROVED.)  
  
FOR FUSIBLE DISCONNECT SWITCHES, PROVIDE FUSE CLIPS DESIGNED TO ACCOMMODATE NEMA FU1, CLASS R FUSES.  
  
CONTRACTOR TO SUBMIT SHOP DRAWINGS ON THIS ITEM.



Fire Station #2 Mechanical Equipment Replacement

Village of Oak Park  
212 Augusta St, Oak Park, IL 60301

NO	ISSUE	DATE
.	OUT FOR BID	4/03/2024
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Electrical  
Symbol List,  
and  
Specifications

E2.10

# VILLAGE OF OAK PARK NORHT FIRE STATION #2

## MECHANICAL EQUIPMENT REPLACEMENT



architecture + interiors

ARCHITECT'S PROJECT NO. 24036

VILLAGE OF OAK PARK  
NORTH FIRE STATION No. 2  
MECHANICAL EQUIPMENT  
REPLACEMENT

VILLAGE OF OAK PARK  
DEPARTMENT OF PUBLIC WORKS  
201 SOUTH BLVD  
OAK PARK, ILLINOIS, 60302

ARCHITECT:           STUDIOGC ARCHITECTURE + INTERIORS  
                          223 WEST JACKSON BOULEVARD  
                          SUITE 1200  
                          CHICAGO, ILLINOIS 60606  
                          312-253-3400

DATE:                 APRIL 3, 2024

TABLE OF CONTENTS

<u>NO.</u>	<u>SECTION</u>	<u>PAGES</u>
<u>PROCUREMENT AND CONTRACTING REQUIREMENTS</u>		
	REQUEST FOR PROPOSAL BY VILLAGE OF OAK PARK.....	35
<u>CONDITIONS OF THE CONTRACT</u>		
PER REQUEST FOR PROPOSAL BY VILLAGE OF OAK PARK		
<u>DIVISION 01 - GENERAL REQUIREMENTS</u>		
011000	SUMMARY.....	4
012500	SUBSTITUTION PROCEDURES .....	4
012600	CONTRACT MODIFICATION PROCEDURES .....	2
012900	PAYMENT PROCEDURES .....	4
013100	PROJECT MANAGEMENT AND COORDINATION.....	7
013200	CONSTRUCTION PROGRESS DOCUMENTATION.....	5
013300	SUBMITTAL PROCEDURES.....	3
014000	QUALITY REQUIREMENTS .....	7
014200	REFERENCES .....	16
015000	TEMPORARY FACILITIES AND CONTROLS .....	7
016000	PRODUCT REQUIREMENTS .....	4
017300	EXECUTION .....	6
017700	CLOSEOUT PROCEDURES.....	5
017823	OPERATION AND MAINTENANCE DATA .....	8
017839	PROJECT RECORD DOCUMENTS .....	4
017900	DEMONSTRATION AND TRAINING.....	4
<u>DIVISION 02 - EXISTING CONDITIONS</u>		
024119	SELECTIVE DEMOLITION .....	5
<u>DIVISION 03 – CONCRETE</u>		
033000	CAST IN PLACE CONCRETE.....	22
<u>DIVISION 04 - MASONRY</u>		
042000	UNIT MASONRY .....	12
<u>DIVISION 05 - METALS</u>		
<u>DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES</u>		
061053	MISCELLANEOUS ROUGH CARPENTRY.....	5
<u>DIVISION 07 - THERMAL AND MOISTURE PROTECTION</u>		
072100	THERMAL INSULATION.....	4
073113	ASPHALT SHINGLES.....	6
076200	SHEET METAL FLASHING AND TRIM .....	10
078413	PENETRATION FIRESTOPPING.....	8
078446	FIRE RESISTANCE JOINT SYSTEMS.....	5

079200 JOINT SEALANTS ..... 6

DIVISION 08 – OPENINGS

083113 ACCESS DOORS AND FRAMES..... 3

DIVISION 09 - FINISHES

092216 NON-STRUCTURAL METAL FRAMING ..... 5

092900 GYPSUM BOARD ..... 7

095113 ACOUSTICAL PANEL CEILIINGS..... 5

099123 INTERIOR PAINTING..... 7

DIVISION 10 - SPECIALTIES

DIVISION 11 - EQUIPMENT

DIVISION 12 - FURNISHINGS

DIVISION 13 - SPECIAL CONSTRUCTION

DIVISION 21 - FIRE SUPPRESSION

DIVISION 22 - PLUMBING

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

DIVISION 26 – ELECTRICAL

DIVISION 27 – COMMUNICATIONS

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

END OF TABLE OF CONTENTS

SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section. The General Conditions, Supplementary Conditions, and Division 01 General Requirements are hereby made a part of each Division and Section of these Specifications.

1.2 PROJECT DESCRIPTION

- A. The Project consists of removing existing mechanical equipment and providing and installing new mechanical equipment at fire station #2 located at 212 Augusta Ave, Oak Park, IL 60301, for the Village of Oak Park, hereafter called the Owner. To be constructed in accordance with the Contract Documents prepared by Studio GC, dated April 3, 2024.
- B. Scope: The Work includes the work of all trades required; and all the labor, materials, and equipment necessary and incidental to the construction and completion of the Work.
- C. Work to be executed under one General Contract, including all trades.

1.3 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractor shall have limited use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited by the Owner's need for continuity of Fire Department operations.
- B. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.
  - 1. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
  - 2. Move all stored materials or equipment which interferes with the operations of the Owner or other contractors.
- C. Do not load structure with weight that will endanger structure.
- D. Contractor shall assume full responsibility for protection and safekeeping of materials and equipment stored on site.
- E. Contractor shall obtain and pay for additional storage space or work area as required for operations.

1.4 OWNER OCCUPANCY

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

1.5 DUTIES OF CONTRACTOR

- A. Except as specifically noted, provide and pay for:
  - 1. Labor, materials and equipment.
  - 2. Tools, construction equipment and machinery.
  - 3. Other facilities and services required to complete the Work.
- B. Secure and pay for as required to complete the Work, and as applicable at the time of receipt of bids:
  - 1. Licenses.
  - 2. Fees.
- C. Give required notices to Owner, testing agency, and public authorities which have jurisdiction over the Work.
- D. Comply with codes, ordinances and other legal requirements of public authorities which have jurisdiction over the Work.
- E. Promptly submit written notice to the Architect of any observed variance of Contract Documents from legal requirements.
- F. Provide bonds for each portion of the Work.
- G. Activities which are to occur on site during the construction period shall be coordinated with Owner to establish proper dates which construction operations may occur.
- H. The Contractor shall include expedited delivery schedules, additional labor shifts, overtime work, and such other labor, equipment and materials as are necessary to complete each portion of the work by the date of Substantial Completion.
- I. Utilities Shut-offs shall not occur without prior approval of the Owner.

1.6 PROJECT LIMITATIONS

- A. The Work shall commence as follows (subject to lead time/availability of mechanical equipment):
  - 1. Commencement of Work on site: July 30, 2024
  - 2. Final Completion of Work on site: November 30, 2024
- B. The Work shall not commence until the contractor's bonds and insurance have been received and approved by the Owner.

1.7 TIME OF COMPLETION AND OCCUPANCY

- A. As part of the bid proposal, the general contractor is to submit a proposed project schedule for the work.

1.8 JOB OPERATIONS

A. Work Limitations:

1. Areas that are under construction are located adjacent to areas occupied by the Owner's personnel and the public. Owner will endeavor to remain out of construction zones.
2. Owner will occupy those spaces in the building that are not under construction during each phase for the purpose of maintain fire department operations.
3. Schedule and perform work in such a manner so as not to disrupt existing electrical, plumbing and mechanical systems in the building areas that are used for maintaining fire department operations. Existing systems must remain fully functional at all times; the fire station is open 24 hours a day. Provide Owner with minimum 48 hours' notice of any required shut down of any existing system.
4. Provide Owner with minimum 48-hour notice before starting demolition of any area that may disturb Owner's operations.
5. Maintain required exits and exit pathways at all times building is occupied.

B. Project Security:

1. General Project Security to be provided by the General Contractor. All Subcontractors must provide necessary precautions to protect their own materials and equipment until such Work is installed and operational.
2. Provide necessary precautions, including, but not limited to barriers and/or fencing, to protect Owner's personnel, pedestrians and workmen in the area of construction or demolition, as well as areas with stored materials and equipment.
3. Securely close off all areas of construction to prevent unauthorized entry.

1.9 ELECTRICAL UTILITIES

- A. Owner will provide electrical power for construction activities in the form of designated existing line-voltage receptacles:

1. Coordinate power requirements with owner's representative.
2. Do not use emergency power circuits.
3. Do not overload circuits.
4. Provide all necessary extension cords.

- B. Contractor, if it intends to set a trailer on site as part of their operation, shall be responsible for obtaining and paying for a temporary electrical service to run the trailer.

- C. Contractor, if existing line voltage is insufficient to perform their work, shall be responsible for obtaining and paying for additional temporary electrical infrastructure to run the project.

1.10 CLEAN UP

- A. Rubbish and debris resulting from the Work shall be collected and properly disposed of away from the site. If the Owner is required to perform cleaning as a result of the Contractor's lack of cleaning, the Owner may perform the required cleaning. If the Owner performs the cleaning, the Contractor will be backcharged at a rate of three (3) times the cost of the cleaning including labor and material costs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

## SECTION 012500 - SUBSTITUTION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Sections:
  - 1. Division 01 Section "Allowances" for products selected under an allowance.
  - 2. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
  - 3. Divisions 02 through 32 Sections for specific requirements and limitations for substitutions.

#### 1.3 DEFINITIONS

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

#### 1.4 SUBMITTALS

- A. Substitution Requests: Submit each request for consideration electronically. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use facsimile of form provided in the Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect,

- sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one (1) week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
  - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

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

## 1.6 PROCEDURES

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

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

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

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - b. Substitution request is fully documented and properly submitted.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
  
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
  1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Substitution request is fully documented and properly submitted.
    - e. Requested substitution will not adversely affect Contractor's construction schedule.
    - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - g. Requested substitution is compatible with other portions of the Work.
    - h. Requested substitution has been coordinated with other portions of the Work.
    - i. Requested substitution provides specified warranty.
    - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SUBSTITUTIONS REQUEST FROM

All bids shall be based upon the Contractor providing materials and equipment as required by the proposed Contract Documents.

Bidders desiring to propose substitutions for acceptable manufacturers, suppliers, materials and/or equipment indicated within the specifications shall list below such proposed substitutions, along with the amount to be added or deducted from the lump sum base bid should the Owner decide to accept such proposed substitutions.

The Owner reserves the right to reject any and all such proposed substitutions.

Proposed substitutions will not be used to determine the low bid.

In order to receive consideration, each proposed substitution shall be accompanied by complete technical data and written description of material or product, including effect on the construction schedule.

Note: Manufacturers, suppliers, materials and/or equipment approved by the Architect prior to the scheduled time for receipt of Bids, but not indicated in Addenda, must be listed below if said change from the specification requirements is to be considered.

<u>ITEM SPECIFIED</u>	<u>PROPOSED SUBSTITUTION</u>	<u>ADD</u>	<u>DEDUCT</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Name of Bidder: \_\_\_\_\_

Date: \_\_\_\_\_

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Division 01 Section "Allowances" for procedural requirements for handling and processing allowances.
  - 2. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 5 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. Furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.
  - 5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - 6. Comply with requirements in Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

#### 1.5 CHANGE ORDER PROCEDURES

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

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Division 01 Section "Allowances" for procedural requirements governing handling and processing of allowances.
  - 2. Division 01 Section "Unit Prices" for administrative requirements governing use of unit prices.
  - 3. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittals Schedule.
    - c. Contractor's Construction Schedule.
  - 2. Submit the Schedule of Values to Architect at earliest possible date, but no later than the date scheduled for the pre-construction meeting.
  - 3. Subschedules: Where the Work is separated into multiple sites or phases, provide sub-schedules showing values correlated with each site or phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the Schedule of Values:

- a. Project name and location.
  - b. Name of Architect.
  - c. Architect's project number.
  - d. Contractor's name and address.
  - e. Date of submittal.
2. Submit draft of AIA Document G703 Continuation Sheets.
  3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value.
      - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
  4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 10 percent of the Contract Sum.
  5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if stored off site.
  7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
  9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the Schedule of Values and not distributed as general overhead expense.
  10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  - 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  - 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 2 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. Each copy shall include waivers of lien and similar attachments.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien as follows:
  - 1. From the Prime contractor for the Work covered by the payment.
  - 2. From subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
    - a. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
    - b. When an application shows completion of an item, submit final or full waivers.
    - c. Owner reserves the right to designate which entities involved in the Work must submit waivers.
    - d. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
    - e. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of Values.

3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list and local suppliers of products. List supplier's name, address, and contact person.
  5. Schedule of unit prices.
  6. Submittals Schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Initial settlement survey and damage report if required.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. Coordination Drawings.
  - 2. Administrative and supervisory personnel.
  - 3. Project meetings.
  - 4. Requests for Interpretation (RFIs).
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
  - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
  - 2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

#### 1.5 SUBMITTALS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
  - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
  - b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
  - c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
  - d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
  - e. Indicate required installation sequences.
  - f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Key Personnel Names: Within **15** days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other contractors.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Preparation of Record Documents.
    - l. Use of the premises and existing building.
    - m. Work restrictions.
    - n. Owner's occupancy requirements.
    - o. Responsibility for temporary facilities and controls.
    - p. Construction waste management and recycling.
    - q. Parking availability.
    - r. Office, work, and storage areas.
    - s. Equipment deliveries and priorities.
    - t. First aid.
    - u. Security.
    - v. Progress cleaning.
    - w. Working hours.
  3. Minutes: Record and distribute meeting minutes.

- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. The Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility problems.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written recommendations.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
  - 1) Interface requirements.
  - 2) Sequence of operations.
  - 3) Status of submittals.
  - 4) Deliveries.
  - 5) Off-site fabrication.
  - 6) Access.
  - 7) Site utilization.
  - 8) Temporary facilities and controls.
  - 9) Work hours.
  - 10) Hazards and risks.
  - 11) Progress cleaning.
  - 12) Quality and work standards.
  - 13) Status of correction of deficient items.
  - 14) Field observations.
  - 15) RFIs.
  - 16) Status of proposal requests.
  - 17) Pending changes.
  - 18) Status of Change Orders.
  - 19) Pending claims and disputes.
  - 20) Documentation of information for payment requests.
3. Minutes: Record the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- E. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
  1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or

behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
  - c. Review present and future needs of each contractor present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Work hours.
    - 10) Hazards and risks.
    - 11) Progress cleaning.
    - 12) Quality and work standards.
    - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.8 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
  1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
  1. Project name.
  2. Date.
  3. Name of Contractor.
  4. Name of Architect.
  5. RFI number, numbered sequentially.
  6. Specification Section number and title and related paragraphs, as appropriate.
  7. Drawing number and detail references, as appropriate.
  8. Field dimensions and conditions, as appropriate.
  9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  10. Contractor's signature.
  11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

- a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or RFIs with numerous errors.
  2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within three days of receipt of the RFI response.
- D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within three days if Contractor disagrees with response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for schedules and reports required for proper performance of the Work.
- B. Coordination: Each prime Contractor shall closely coordinate scheduling and reporting with the scheduling and reporting of other prime Contractors.
- C. Schedules required include:
  - 1. Preliminary Construction Schedule.
  - 2. Contractor's Construction Schedule.
  - 3. Schedule of Inspections and Tests.
- D. Reports required include:
  - 1. Daily Construction Reports.
  - 2. Material location reports.
  - 3. Field correction reports.
  - 4. Special reports.
- E. The schedule of values is included in Section "Payment Procedures."
- F. Project meeting minutes are included in Section "Project Management and Coordination."
- G. Inspection and test reports are included in Section "Quality Requirements."

1.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit a preliminary horizontal bar-chart type construction schedule within 2 days of the date established for Commencement of the Work.
  - 1. Provide a separate time bar for each significant construction activity. Coordinate each element on the schedule with other construction activities. Schedule each construction activity in proper sequence. Provide a continuous vertical line to identify the first working day of each week.
  - 2. Indicate completion of the Work in advance of the date established for Substantial Completion.
- B. Submittal Tabulation: With the submittal of the Preliminary Construction Schedule, include a tabulation by date of submittals required during the first 90 days of construction. List those submittals required to

maintain orderly progress of the Work, and those required early because of long lead time for manufacture or fabrication.

1. At the Contractor's option, submittal dates may be shown on the schedule, in lieu of being tabulated separately.

#### 1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a comprehensive, fully developed, horizontal bar-chart type Contractor's Construction Schedule based on the Preliminary Construction Schedule and on whatever updating and feedback was received since the start of the Project.

1. Submit the schedule within 15 days of the date established for commencement of the Work.
2. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.
  - a. If practical, use the same breakdown of units of the Work as indicated in the "Schedule of Values."
3. For significant construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within the time bar. As Work progresses, place a contrasting mark in each bar to indicate actual completion percentage.
4. Prepare the Schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data clearly for the entire construction period.
5. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other portions of the Work; include minor elements involved in the overall sequence of the Work. Show each construction activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
6. Coordinate the Contractor's Construction Schedule with the schedule of values, list of subcontracts, Submittal Schedule, progress reports, payment requests and other required schedules and reports.
7. Indicate completion of the Work in advance of the date established for Substantial Completion. Indicate Substantial Completion on the Schedule to allow ample time for the Architect administrative procedures necessary for Certification of Substantial Completion.

- B. Phasing: Provide notations on the Schedule to show how the sequence of the Work is affected by the following:

1. Requirements for phased completion.
2. Work by separate Contractors.
3. Work by the Owner.
4. Pre-purchased materials.
5. Coordination with existing construction.
6. Limitations of continued occupancies.
7. Uninterruptible services.
8. Partial occupancy prior to Substantial Completion.
9. Site restrictions.
10. Provisions for future construction.
11. Seasonal variations.
12. Environmental control.

- C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work.
  - D. Such stages include, but are not necessarily limited to:
    - 1. Subcontract awards.
    - 2. Purchases.
    - 3. Mockups.
    - 4. Fabrication.
    - 5. Sample testing.
    - 6. Deliveries.
    - 7. Installation.
    - 8. Testing.
    - 9. Adjusting.
    - 10. Curing.
    - 11. Start-up and placement into final use and operation.
  - E. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this article, a "major area" is defined as a story of construction, separate buildings or a similar significant construction element.
    - 1. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
      - a. Structural Completion.
      - b. Permanent space enclosure.
      - c. Completion of mechanical installation.
      - d. Completion of the electrical portion of the Work.
      - e. Substantial Completion.
  - F. Cost Correlation: Immediately below the date line at the head of the bar-chart, provide a two item cost correlation line, indicating both "precalculated" and "actual" costs. On the cost correlation line show dollar-volume of Work performed as of the same dates used for preparation of payment requests.
    - 1. Refer to Section "Payment Procedures" for cost reporting and payment procedures.
  - G. Distribution: Following the Architect response to initial submittal of the Contractor's Construction Schedule, print and distribute copies to the Architect, Owner, separate contractors, subcontractors, suppliers, fabricators, and other parties required to comply with scheduled dates.
    - 1. Post copies of the Schedule in the Project meeting room and temporary field office.
    - 2. When revisions are made, distribute the updated Schedule to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.
  - H. Schedule Updating: Revise the Schedule immediately after each meeting or other activity, where revisions have been recognized or made. Issue the updated Schedule concurrently with report of each meeting.
- 1.5 SCHEDULE OF INSPECTIONS AND TESTS
- A. Prepare a schedule of inspections, tests and similar services required by the Contract Documents. Submit the schedule within 30 days of the date established for commencement of the Work.

- B. Form: The Schedule shall be in tabular form and shall include but not be limited to the following data:
1. Specification Section number.
  2. Description of the test.
  3. Identification of applicable standards.
  4. Identification of test methods.
  5. Number of tests required.
  6. Time schedule or time span for tests.
  7. Entity responsible for performing tests.
  8. Requirements for taking Samples.
  9. Unique characteristics of each service.
- C. Distribution: Distribute the Schedule to the Owner, Architect, and each party involved in performance of portions of the Work, where inspections and tests are required.

## 1.6 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at weekly intervals:
1. List of subcontractors at the site.
  2. List of separate contractors at the site.
  3. Approximate count of personnel at the site.
  4. High and low temperatures, general weather conditions.
  5. Accidents (refer to accident reports).
  6. Meetings and significant decisions.
  7. Unusual events (refer to special reports).
  8. Stoppages, delays, shortages, losses.
  9. Meter readings and similar recordings.
  10. Emergency procedures.
  11. Orders and requests of governing authorities.
  12. Change Orders received, implemented.
  13. Services connected, disconnected.
  14. Equipment or system tests and start-ups.
  15. Partial Completions, occupancies.
  16. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals prepare a comprehensive list of materials delivered to and stored at the site. The list shall be cumulative, showing materials previously reported plus items recently delivered. Include with the list a statement of progress on and delivery dates for all materials or items of equipment being fabricated or stored away from the building site. Submit copies of the list to the Architect at weekly intervals.
- C. Field Correction Report: When the need to take corrective action that requires a departure from the Contract Documents arises, prepare a detailed report including a statement describing the problem and recommended changes. Indicate reasons the Contract Documents cannot be followed. Submit a copy to the Architect immediately.
- D. The Contractor shall furnish to the Owner weekly written progress reports including an updated schedule of construction and schedule of values in duplicate on all construction activities.

1.7 ACCIDENT REPORTS

- A. General: The Contractor shall provide a written report to the Owner of any and all accident whatsoever arising out of or in connection with the performance of the Work, whether on or adjacent to the site, which causes death or personal injury or property damage. The report shall be furnished to the Owner within five (5) days of the occurrence.

1.8 FIELD CORRECTION REPORTS

- A. Field Correction Report: When the need to take corrective action that requires a departure from the Contract Documents arises, prepare a detailed report including a statement describing the problem and recommended changes. Indicate reasons the Contract Documents cannot be followed. Submit a copy to the Architect immediately.

1.9 SPECIAL REPORTS

- A. General: Submit special reports directly to the Owner within one day of an occurrence. Submit a copy to the Architect and other parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at the site, prepare and submit a special report. List the chain of events, persons participating, response by the Contractor's personnel, an evaluation of the results or effects and similar pertinent information. Advise the Owner in advance when such events are known or predictable.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULES & REPORTS

- A. General: Maintain a record of all schedules and reports. Include with electronic version of closeout documents to Owner.

END OF SECTION 013200

## SECTION 013300 – SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work including:
  - 1. Submittal schedule.
  - 2. Shop Drawings.
  - 3. Product Data.
  - 4. Samples.
- B. Administrative Submittals: Refer to other Division 01 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
  - 1. Permits.
  - 2. Applications for payment.
  - 3. Performance and payment bonds.
  - 4. Insurance certificates.
  - 5. List of Subcontractors.
  - 6. Schedule of Values.
- C. Inspection and test reports are included in Section "Quality Requirements."

#### 1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
  - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
    - a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  - 3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

- a. Allow ten (10) business days for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
  - b. If an intermediate submittal is necessary, process the same as the initial submittal.
  - c. Allow ten (10) business days for reprocessing each submittal.
  - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Architect will provide access to their Newforma Project Center (Project Management System) to the Contractor for logging, transmission, and overall management of electronic submittals.
1. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
  2. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
  3. Include the following information on the label for processing and recording action taken.
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect/Engineer.
    - d. Name and address of Contractor.
    - e. Name and address of subcontractor.
    - f. Name and address of supplier.
    - g. Name of manufacturer.
    - h. Number and title of appropriate Specification Section.
    - i. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- 1.4 CONTRACTOR'S REVIEW OF SUBMITTALS
- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
  - B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp or indication in web-based Project software. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
  - C. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.5 ARCHITECT ACTION

- A. Except for submittals for record, information or similar purposes, where action and return are required or requested, the Architect/Engineer will review each submittal, mark to indicate action taken, and return promptly.
  - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
  - 1. Final Unrestricted Release: Where submittals are marked "Accepted," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
  - 2. Final-But-Restricted Release: When submittals are marked "Accepted as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
  - 3. Returned for Resubmittal: When submittal is marked "Not Accepted, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary, to obtain a different action mark.
    - a. Do not permit submittals marked "Not Accepted, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
  - 4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "No Action Taken"

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
  - 1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
  - 2. Division 01 Section "Execution" for repair and restoration of construction disturbed by testing and inspecting activities.
  - 3. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
  - 1. Material testing related to excavation and backfill testing and observation, cast in place concrete and reinforcement testing and observation, unit masonry mortar grout and reinforcement testing and observation, structural steel weld and bolt testing and observation, hot-mix asphalt testing and observation are conducted by Owner. Contractor shall be responsible for coordinating with Owner's testing agency to have testing and observation completed when required based on the construction schedule. Contractor shall maintain a log of all testing requested of the Owner's testing agency and documented results. The cost of follow up testing or observation that is required due to failed inspections, Contractor work not being ready for scheduled inspection, or miss communication by the Contractor which require rescheduling of the inspection shall be the responsibility of the Contractor.
  - 2. Material testing specified in the individual specifications, and not noted above, are to be provided by the Contractor's testing agency funded from the testing allowance at the discretion of the Owner through written authorization.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of **five** previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

#### 1.5 CONFLICTING REQUIREMENTS

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

#### 1.6 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  1. Specification Section number and title.
  2. Description of test and inspection.
  3. Identification of applicable standards.
  4. Identification of test and inspection methods.
  5. Number of tests and inspections required.
  6. Time schedule or time span for tests and inspections.
  7. Entity responsible for performing tests and inspections.
  8. Requirements for obtaining samples.
  9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
  1. Date of issue.
  2. Project title and number.
  3. Name, address, and telephone number of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments,

judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

- E. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

#### 1.7 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
  2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
  3. Demonstrate the proposed range of aesthetic effects and workmanship.
  4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
    - a. Allow three days for initial review and each re-review of each mockup.
  5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  6. Demolish and remove mockups when directed, unless otherwise indicated.
- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 02 through 33.

## 1.8 QUALITY CONTROL

- A. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Contractor shall engage a qualified testing agency to perform these quality-control services.
  2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  3. Where quality-control services are indicated, submit a certified written report, in duplicate, of each quality-control service.
  4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

- B. **Manufacturer's Field Services:** Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- C. **Retesting/Reinspecting:** Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. **Testing Agency Responsibilities:** Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and which tests are conducted.
  - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  - 6. Do not perform any duties of Contractor.
- E. **Associated Services:** Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- F. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- G. **Schedule of Tests and Inspections:** Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents.
  - 1. **Distribution:** Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

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

3.2 REPAIR AND PROTECTION

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

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board <a href="http://www.access-board.gov">www.access-board.gov</a>	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office <a href="http://www.access.gpo.gov/nara/cfr">www.access.gpo.gov/nara/cfr</a>	(888) 293-6498 (202) 512-1530
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterways Experiment Station <a href="http://www.wes.army.mil">www.wes.army.mil</a>	(601) 634-2355
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>	(215) 697-6257
DSCC	Defense Supply Center Columbus (See FS)	
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>	(215) 697-6257
	Available from General Services Administration <a href="http://www.apps.fss.gsa.gov/pub/fedspecs/index.cfm">www.apps.fss.gsa.gov/pub/fedspecs/index.cfm</a>	(202) 619-8925
	Available from National Institute of Building Sciences <a href="http://www.nibs.org">www.nibs.org</a>	(202) 289-7800
FTMS	Federal Test Method Standard (See FS)	
MIL	See MILSPEC	
MS MIL	See MILSPEC	

MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point <a href="http://www.dodssp.daps.mil">www.dodssp.daps.mil</a>	(215) 697-6257
UFAS	Uniform Federal Accessibility Standards Available from Access Board <a href="http://www.access-board.gov">www.access-board.gov</a>	(800) 872-2253 (202) 272-5434

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) <a href="http://www.aluminum.org">www.aluminum.org</a>	(202) 862-5100
AAADM	American Association of Automatic Door Manufacturers <a href="http://www.aaadm.com">www.aaadm.com</a>	(216) 241-7333
AABC	Associated Air Balance Council <a href="http://www.aabchq.com">www.aabchq.com</a>	(202) 737-0202
AAMA	American Architectural Manufacturers Association <a href="http://www.aamanet.org">www.aamanet.org</a>	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials <a href="http://www.aashto.org">www.aashto.org</a>	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) <a href="http://www.aatcc.org">www.aatcc.org</a>	(919) 549-8141
ABMA	American Bearing Manufacturers Association <a href="http://www.abma-dc.org">www.abma-dc.org</a>	(202) 367-1155
ACI	American Concrete Institute/ACI International <a href="http://www.aci-int.org">www.aci-int.org</a>	(248) 848-3700
ACPA	American Concrete Pipe Association <a href="http://www.concrete-pipe.org">www.concrete-pipe.org</a>	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) <a href="http://www.aeic.org">www.aeic.org</a>	(205) 257-2530

AFPA	American Forest & Paper Association (See AF&PA)	
AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHA	American Hardboard Association www.hardboard.org	(847) 934-8800
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
AI	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America www.alca.org	(800) 395-2522 (703) 736-9666
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
AOSA	Association of Official Seed Analysts www.aosaseed.com	(505) 522-1437
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
API	American Petroleum Institute	(202) 682-8000

	<a href="http://www.api.org">www.api.org</a>	
ARI	Air-Conditioning & Refrigeration Institute <a href="http://www.ari.org">www.ari.org</a>	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Association <a href="http://www.asphaltroofing.org">www.asphaltroofing.org</a>	(202) 207-0917
ASCA	Architectural Spray Coaters Association <a href="http://www.ascassoc.com">www.ascassoc.com</a>	(856) 848-6120
ASCE	American Society of Civil Engineers <a href="http://www.asce.org">www.asce.org</a>	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers <a href="http://www.ashrae.org">www.ashrae.org</a>	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) <a href="http://www.asme.org">www.asme.org</a>	(800) 843-2763 (212) 591-7722
ASSE	American Society of Sanitary Engineering <a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) <a href="http://www.astm.org">www.astm.org</a>	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industries International) <a href="http://www.awci.org">www.awci.org</a>	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (See WCSC)	
AWI	Architectural Woodwork Institute <a href="http://www.awinet.org">www.awinet.org</a>	(800) 449-8811 (703) 733-0600
AWPA	American Wood-Preservers' Association <a href="http://www.awpa.com">www.awpa.com</a>	(817) 326-6300
AWS	American Welding Society <a href="http://www.aws.org">www.aws.org</a>	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association <a href="http://www.awwa.org">www.awwa.org</a>	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association <a href="http://www.buildershardware.com">www.buildershardware.com</a>	(212) 297-2122
BIA	Brick Industry Association (The) <a href="http://www.bia.org">www.bia.org</a>	(703) 620-0010
BIFMA	BIFMA International	(616) 285-3963

	(Business and Institutional Furniture Manufacturer's Association International) www.bifma.com	
CCC	Carpet Cushion Council www.carpetcushion.org	(203) 637-1312
CCFSS	Center for Cold-Formed Steel Structures www.umn.edu/~ccfss	(573) 341-4471
CDA	Copper Development Association Inc. www.copper.org	(800) 232-3282 (212) 251-7200
CEA	Canadian Electricity Association www.canelect.ca	(514) 866-6121
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CGSB	Canadian General Standards Board www.pwgsc.gc.ca/cgsb	(819) 956-0425
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSA	CSA International (Formerly: IAS - International Approval Services) www.csa-international.org	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
CSSB	Cedar Shake & Shingle Bureau www.cedarbureau.org	(604) 820-7700

CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee www.asce.org	(800) 548-2723 (703) 295-6300
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
ESD	ESD Association	(315) 339-6937
FCI	Fluid Controls Institute www.fluidcontrolsintitute.org	(216) 241-7333
FGMA	Flat Glass Marketing Association (See GANA)	
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	(401) 275-3000
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridarroof.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fscoax.org	52 951 5146905
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association) www.glasswebsite.com	(785) 271-0208
GRI	Geosynthetic Research Institute www.drexel.edu/gri	(215) 895-2343

GTA	Glass Tempering Division of Glass Association of North America (See GANA)	
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
HPW	H. P. White Laboratory, Inc. www.hpwhite.com	(410) 838-6550
IAS	International Approval Services (See CSA)	
ICEA	Insulated Cable Engineers Association, Inc. www.icea.net	(770) 830-0369
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEC	International Electrotechnical Commission www.iec.ch	41 22 919 02 11
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	(613) 233-1510
ILI	Indiana Limestone Institute of America, Inc. www.iliai.com	(812) 275-4426
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(702) 567-8150
ITS	Intertek Testing Services www.itsglobal.com	(800) 345-3851 (607) 753-6711
IWS	Insect Screening Weavers Association (Now defunct)	

KCMA	Kitchen Cabinet Manufacturers Association <a href="http://www.kcma.org">www.kcma.org</a>	(703) 264-1690
LMA	Laminating Materials Association <a href="http://www.lma.org">www.lma.org</a>	(201) 664-2700
LPI	Lightning Protection Institute <a href="http://www.lightning.org">www.lightning.org</a>	(800) 488-6864 (847) 577-7200
LSGA	Laminated Safety Glass Association (See GANA)	
MBMA	Metal Building Manufacturers Association <a href="http://www.mbma.com">www.mbma.com</a>	(216) 241-7333
MFMA	Maple Flooring Manufacturers Association <a href="http://www.maplefloor.org">www.maplefloor.org</a>	(847) 480-9138
MFMA	Metal Framing Manufacturers Association <a href="http://www.metalframingmfg.org">www.metalframingmfg.org</a>	(312) 644-6610
MH	Material Handling Industry of America (See MHIA)	
MHIA	Material Handling Industry of America <a href="http://www.mhia.org">www.mhia.org</a>	(800) 345-1815 (704) 676-1190
MIA	Marble Institute of America <a href="http://www.marble-institute.com">www.marble-institute.com</a>	(440) 250-9222
MPI	Master Painters Institute <a href="http://www.paintinfo.com">www.paintinfo.com</a>	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. <a href="http://www.mss-hq.com">www.mss-hq.com</a>	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers <a href="http://www.naamm.org">www.naamm.org</a>	(312) 332-0405
NAAMM	North American Association of Mirror Manufacturers (See GANA)	
NACE	NACE International (National Association of Corrosion Engineers International) <a href="http://www.nace.org">www.nace.org</a>	(281) 228-6200
NADCA	National Air Duct Cleaners Association <a href="http://www.nadca.com">www.nadca.com</a>	(202) 737-2926
NAIMA	North American Insulation Manufacturers Association (The) <a href="http://www.naima.org">www.naima.org</a>	(703) 684-0084
NAMI	National Accreditation and Management Institute, Inc.	(304) 258-5100

NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(303) 697-8441
NFPA	NFPA International (National Fire Protection Association International) www.nfpa.org	(800) 344-3555 (617) 770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	National Oak Flooring Manufacturers Association www.nofma.org	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010

NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTMA	National Terrazzo and Mosaic Association, Inc. www.ntma.com	(800) 323-9736 (703) 779-1022
NTRMA	National Tile Roofing Manufacturers Association (See RTI)	
NWWDA	National Wood Window and Door Association (See WDMA)	
OPL	Omega Point Laboratories, Inc. www.opl.com	(800) 966-5253 (210) 635-8100
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting and Decorating Contractors of America www.pdca.com	(800) 332-7322 (703) 359-0826
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (508) 230-3516
PGI	PVC Geomembrane Institute www.pgi-tp.ce.uiuc.edu	(217) 333-3929
RCSC	Research Council on Structural Connections www.boltcouncil.org	(800) 644-2400 (312) 670-2400
RFCI	Resilient Floor Covering Institute  www.rfci.com	Contact by mail only
RIS	Redwood Inspection Service www.calredwood.org	(888) 225-7339 (415) 382-0662
RTI	Roof Tile Institute (Formerly: NTRMA - National Tile Roofing Manufacturers Association) www.ntrma.org	(541) 689-0366
SAE	SAE International www.sae.org	(724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 462-1930
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabfurn.com	(516) 294-5424
SGCC	Safety Glazing Certification Council	(315) 646-2234

	<a href="http://www.sgcc.org">www.sgcc.org</a>	
SIA	Security Industry Association <a href="http://www.siaonline.org">www.siaonline.org</a>	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (See IGMA)	
SJI	Steel Joist Institute <a href="http://www.steeljoist.org">www.steeljoist.org</a>	(843) 626-1995
SMA	Screen Manufacturers Association	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association <a href="http://www.smacna.org">www.smacna.org</a>	(703) 803-2980
SMPTE	Society of Motion Picture and Television Engineers <a href="http://www.smpte.org">www.smpte.org</a>	(914) 761-1100
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) <a href="http://www.sprayfoam.org">www.sprayfoam.org</a>	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) <a href="http://www.spib.org">www.spib.org</a>	(850) 434-2611
SPI/SPFD	Society of the Plastics Industry, Inc. (The) Spray Polyurethane Foam Division (See SPFA)	
SPRI	SPRI (Single Ply Roofing Institute) <a href="http://www.spri.org">www.spri.org</a>	(781) 647-7026
SSINA	Specialty Steel Industry of North America <a href="http://www.ssina.com">www.ssina.com</a>	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings <a href="http://www.sspc.org">www.sspc.org</a>	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute <a href="http://www.steeltank.com">www.steeltank.com</a>	(847) 438-8265
SWI	Steel Window Institute <a href="http://www.steelwindows.com">www.steelwindows.com</a>	(216) 241-7333
SWRI	Sealant, Waterproofing, & Restoration Institute <a href="http://www.swrionline.org">www.swrionline.org</a>	(816) 472-7974
TCA	Tile Council of America, Inc. <a href="http://www.tileusa.com">www.tileusa.com</a>	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic	(703) 907-7700

	Industries Alliance www.tiaonline.org	
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(608) 833-5900
TPI	Turfgrass Producers International www.turfgrassod.org	(800) 405-8873 (847) 705-9898
UL	Underwriters Laboratories Inc. www.ul.com	(800) 704-4050 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USITT	United States Institute for Theatre Technology, Inc. www.usitt.org	(800) 938-7488 (315) 463-6463
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WCMA	Window Covering Manufacturers Association (See WCSC)	
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association) www.windowcoverings.org	(800) 506-4636 (212) 661-4261
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association) www.wdma.com	(800) 223-2301 (847) 299-5200
WIC	Woodwork Institute of California www.wicnet.org	(916) 372-9943
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	(800) 725-0333 (650) 548-0112
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone

numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

BOCA	BOCA International, Inc. www.bocai.org	(708) 799-2300
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials (The) www.iapmo.org	(909) 595-8449
ICBO	International Conference of Building Officials www.icbo.org	(800) 284-4406 (562) 699-0541
ICBO ES	ICBO Evaluation Service, Inc. www.icbo.org/ICBO_ES/	(800) 423-6587
ICC	International Code Council, Inc. (Formerly: CABO - Council of American Building Officials) www.intlcode.org	(703) 931-4533
SBCCI	Southern Building Code Congress International, Inc. www.sbcci.org	(205) 591-1853

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE	Army Corps of Engineers www.usace.army.mil	
CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-0990
DOC	Department of Commerce www.doc.gov	(202) 482-2000
EPA	Environmental Protection Agency www.epa.gov	(202) 260-2090
FAA	Federal Aviation Administration www.faa.gov	(202) 366-4000
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(202) 708-5082

HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
LBL	Lawrence Berkeley Laboratory (See LBNL)	
LBNL	Lawrence Berkeley National Laboratory www.lbl.gov	(510) 486-5605
NCHRP	National Cooperative Highway Research Program (See TRB)	
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
PBS	Public Building Service (See GSA)	
RUS	Rural Utilities Service (See USDA)	(202) 720-9540
SD	State Department www.state.gov	(202) 647-4000
TRB	Transportation Research Board www.nas.edu/trb	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791
USPS	Postal Service www.usps.com	(202) 268-2000

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CAPUC (See CPUC)

CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation www.dca.ca.gov/bhfti	(800) 952-5210 (916) 574-2041
CPUC	California Public Utilities Commission www.cpuc.ca.gov	(415) 703-2782

VILLAGE OF OAK PARK – NORTH FIRE STATION #2  
MECHANICAL EQUIPMENT REPLACEMENT

PROJ. NO. 24036

TFS Texas Forest Service  
Forest Products Laboratory  
[www.txforestsERVICE.tamu.edu](http://www.txforestsERVICE.tamu.edu)

(936) 639-8180

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
  - 1. Temporary electric power and light.
  - 2. Temporary heat or cooling.
- C. Temporary construction and support facilities to be provided by the General Contractor include, but are not limited to:
  - 1. Field offices and storage sheds as needed.
  - 2. Temporary enclosures.
  - 3. Waste disposal services.
  - 4. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities to be provided by the General Contractor include, but are not limited to:
  - 1. Barricades, warning signs, lights.
  - 2. Enclosure to separate work area from remainder of fire station.

1.3 SUBMITTALS

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements.
  - 2. Health and safety regulations.
  - 3. Utility company regulations.
  - 4. Police, Fire Department and Rescue Squad rules.
  - 5. Environmental protection regulations.

- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
  - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
  - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

## 1.5 PROJECT CONDITIONS

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility or negotiate terms of use of existing utilities with Owner if available. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
  - 1. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
  - 2. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.
- C. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- D. Water: Provide potable water approved by local health authorities.
- E. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.
- F. Construction Sign: Provide 4' x 8' sign on approved backup material, mounted to three 4" galvanized steel pipe posts. Sign graphic to be provided by Owner.

## 2.2 EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
- G. First Aid Supplies: Comply with governing regulations.
- H. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
  - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service the general contractor requires to perform work. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
  - 1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
  - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
  - 3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
  - 4. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
  - 1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
  - 2. Connect temporary sewers to the municipal system as directed by the sewer department officials.
  - 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
- C. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.
- D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for protecting the existing building and its occupants from adverse effects of low or high temperatures or high humidity. Select equipment that will not have a harmful effect on the existing building or occupants.

### 3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access if facilities are required.
  - 1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- C. Toilets: Provide temporary facilities on site for use by contractors. Use of the Owner's existing toilet facilities will not be permitted.
- D. Drinking Water Facilities: Containerized tap-dispenser bottled-water type drinking water units, including paper supply to be provided by General Contractor.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7 to 13 deg C).
- E. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 02 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- F. Temporary Enclosures: General Contractor shall provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
  1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
  2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
  3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

#### 3.4 SUPPORT FACILITIES INSTALLATION

- A. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
  1. Do not load elevators beyond their rated weight capacity.
- B. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

#### 3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."
  1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
  1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations. Unless otherwise indicated on Drawings.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.
  1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- F. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

### 3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  1. Do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Burning: Do not burn waste materials.
  4. Disposal: Remove waste materials from Owner's property and legally dispose of them.

### 3.7 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
  1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.

2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
  2. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.
  3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
    - a. Replace air filters and clean inside of ductwork and housings.
    - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
    - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 015000

## SECTION 016000 – PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.
- B. The Contractor's Construction Schedule is included under Section "Submittal Procedures."
- C. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Substitution Procedures."

#### 1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.
  - 1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
    - a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
    - b. "Foreign Products", as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of nor living within the United States and its possessions.
  - 2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
  - 3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

#### 1.4 SUBMITTALS

- A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.
1. Coordinate the product list schedule with the Contractor's Construction Schedule.
  2. Form: Prepare the product listing schedule with information on each item tabulated under the following column headings:
    - a. Related Specification Section number.
    - b. Generic name used in Contract Documents.
    - c. Proprietary name, model number and similar designations.
    - d. Manufacturer's name and address.
    - e. Supplier's name and address.
    - f. Installer's name and address.
    - g. Projected delivery date, or time span of delivery period.
  3. Completed Schedule: Within 2 business days after date of commencement of the Work, submit 3 copies of the completed product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.
  4. Architect/Engineer's Action: The Architect will respond in writing to the Contractor within 2 business days of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect response will include the following:
    - a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.
- B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
1. No available domestic product complies with the Contract Documents.
  2. Domestic products that comply with Contract Document are only available at prices or terms that are substantially higher than foreign products that also comply with the Contract Documents.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
  2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
  3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
  4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
  5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
  6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
  7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
  2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
- B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
  2. Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
    - a. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
  3. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
  - a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
6. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
7. Visual Matching: Where Specifications require matching an established Sample, the Architect/Engineer's decision will be final on whether a proposed product matches satisfactorily.
  - a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.
8. Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect/Engineer will select the color, pattern and texture from the product line selected.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION OF PRODUCTS:

- A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
  1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Installation of the Work.
  - 3. Cutting and patching.
  - 4. Protection of installed construction.
- B. Related Sections include the following:
  - 1. Division 01 Section "Submittal Procedures" for submitting surveys.
  - 2. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 3. Division 02 Section "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

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

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least **10** days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.

5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architectural Elements: Where cutting and patching exterior or interior elements, indicate processes and procedures for restoring the area to match the existing historical character of the building.
8. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

#### 1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
  1. Primary operational systems and equipment.
  2. Air or smoke barriers.
  3. Fire-suppression systems.
  4. Mechanical systems piping and ducts.
  5. Control systems.
  6. Communication systems.
  7. Conveying systems.
  8. Electrical wiring systems.
  9. Operating systems of special construction in Division 13 Sections.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
  1. Water, moisture, or vapor barriers.
  2. Membranes and flashings.
  3. Exterior curtain-wall construction.
  4. Equipment supports.
  5. Piping, ductwork, vessels, and equipment.
  6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

## 1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize or prevent interruption to occupied areas.

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect and Construction Manager promptly.

- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
- C. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
- D. Establish limits on use of Project site.
- E. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
- F. Inform installers of lines and levels to which they must comply.
- G. Check the location, level and plumb, of every major element as the Work progresses.
- H. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
- I. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- J. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- K. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- L. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

### 3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.5 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Division 02 Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.

- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
  - 1. Inspection procedures.
  - 2. Project record document submittal.
  - 3. Operating and maintenance manual submittal.
  - 4. Submittal of warranties.
  - 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 02 through 32.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
    - a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
  - 2. Advise Owner of pending insurance change-over requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
  - 4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
  - 5. Submit record drawings, maintenance manuals, and similar final record information.
  - 6. Deliver tools, spare parts, extra stock, and similar items.
  - 7. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
  - 8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

9. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

#### 1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
4. Submit consent of surety to final payment.
5. Submit a final liquidated damages settlement statement.
6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

#### 1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
  3. Note related Change Order numbers where applicable.
  4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- D. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
- E. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.
  2. Spare parts list.
  3. Copies of warranties.
  4. Wiring diagrams.
  5. Recommended "turn around" cycles.
  6. Inspection procedures.
  7. Shop Drawings and Product Data.
  8. Fixture lamping schedule.

## 1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 30 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACT CLOSEOUT

- A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Identification systems.
7. Control sequences.
8. Hazards.
9. Cleaning.
10. Warranties and bonds.
11. Maintenance agreements and similar continuing commitments.

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

1. Start-up.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

3.2 FINAL CLEANING

- A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities and Controls".

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Complete cleaning after all construction operations are completed. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
  - a. Remove labels that are not permanent labels.
  - b. Clean transparent materials, including mirrors and glass in doors and windows.
  - c. Clean exposed exterior and interior hard-surfaced finishes and components to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces, extracting all construction debris and dust.

- d. Clean the interior of the duct system. Wipe surfaces of mechanical and electrical equipment and fixtures. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- C. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

- 1. Operation and maintenance documentation directory.
- 2. Emergency manuals.
- 3. Operation manuals for systems, subsystems, and equipment.
- 4. Maintenance manuals for the care and maintenance of products, materials, and finishes systems and equipment.

- B. Related Sections include the following:

- 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
- 2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
- 3. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
- 4. Divisions 02 through 32 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

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

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

- 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
- 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
  - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
  - b. Enable inserted reviewer comments on draft submittals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
  1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
  2. One indexed paper copy in 3 labeled three ring binders are to be provided to the Owner, matching the electronic submittal.

#### 1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

### PART 2 - PRODUCTS

#### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
  1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## 2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
  2. Table of contents.
  3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name, address, and telephone number of Contractor.
  6. Name and address of Architect.
  7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary, to provide essential information for proper operation or maintenance of equipment or system.

- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2 by 11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
  - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

### 2.3 EMERGENCY MANUALS

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

## 2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

## 2.5 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer

or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

- C. Product Information: Include the following, as applicable:
  - 1. Product name and model number.
  - 2. Manufacturer's name.
  - 3. Color, pattern, and texture.
  - 4. Material and chemical composition.
  - 5. Reordering information for specially manufactured products.
  
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. Repair instructions.
  
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
  
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

## 2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
  
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
  
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard printed maintenance instructions and bulletins.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.
  
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.

3. Precautions against improper maintenance.
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training videotape, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
1. Do not use original Project Record Documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."
- G. Comply with Division 01 Section "Project Closeout" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Related Sections include the following:
  - 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
  - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Divisions 02 through 32 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Initial Submittal: Submit one set of PDF files of scanned marked-up Record Prints. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Architect will return documents for corrections, organizing into sets, scanning, and final submittal.
    - b. Final Submittal: Submit one set of Record PDF Drawing plots to Owner and Architect. Submit one paper copy printed from record plots to Owner. Plot and print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.
  - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an understandable drawing technique.
    - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
  2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  - 1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Record PDF Drawings: Organize sheets into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification.

## 2.2 RECORD SPECIFICATIONS

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

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

## PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

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

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
  - 2. Demonstration and training video recordings.
- B. Specified Elsewhere:
  - 1. Refer to technical sections in Divisions 2 through 32 for systems requiring demonstration and training sessions.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name of Architect.
    - c. Name of Contractor.
    - d. Date of video recording.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.6 INSTRUCTION PROGRAM

A. Training Modules:

- 1. Emergencies: Include the following, as applicable:
  - a. Instructions on meaning of warnings, trouble indications, and error messages.
  - b. Instructions on stopping.
  - c. Shutdown instructions for each type of emergency.
  - d. Operating instructions for conditions outside of normal operating limits.
  - e. Sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
- 2. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
- 3. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
- 4. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
- 5. Maintenance: Include the following:

- a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning.
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
6. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

#### 1.7 PREPARATION

- A. Set up instructional equipment at instruction location.

#### 1.8 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  1. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

#### 1.9 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. Digital Video Recordings:
  1. Submit video recordings in electronic format.
  2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
  3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
- B. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
  1. Film training session(s) in segments not to exceed 15 minutes.
    - a. Produce segments to present a single significant piece of equipment per segment.

- b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
  - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- C. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
- 1. Furnish additional portable lighting as required.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

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

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

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

1.4 MATERIALS OWNERSHIP

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

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.

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

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
- B. Predemolition Photographs: Submit before Work begins.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- D. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

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

1.8 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Hazardous Materials, Lead Based Paint: When surfaces containing lead based paint are encountered during the course of demolition, comply with all applicable EPA and IEPA regulations and procedures concerning full or partial demolition.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

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

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
  - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

#### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
  - 1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

#### 3.3 PREPARATION

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

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  4. Dispose of demolished items and materials promptly.
- B. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
  2. Protect items from damage during transport and storage.
  3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- C. Removed and Salvaged Items:
1. Carefully remove and clean face brick in sufficient quantities as may be required to reinstall at transitions between new and existing construction.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

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

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

- 1. Section 030513 "Concrete Water Vapor Reducing Admixture" for admixture for all interior slabs on grade.
- 2. Section 312000.13 "Earth Moving for Buildings" for drainage fill under slabs-on-ground.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site

- 1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
  - a. Contractor's superintendent.
  - b. Independent testing agency responsible for concrete design mixtures.
  - c. Ready-mix concrete manufacturer.
  - d. Concrete Subcontractor.
  - e. Special concrete finish Subcontractor.
- 2. Review the following:
  - a. Special inspection and testing and inspecting agency procedures for field quality control.
  - b. Construction joints, control joints, isolation joints, and joint-filler strips.

- c. Semirigid joint fillers.
- d. Vapor-retarder installation.
- e. Anchor rod and anchorage device installation tolerances.
- f. Cold and hot weather concreting procedures.
- g. Concrete finishes and finishing.
- h. Curing procedures.
- i. Forms and form-removal limitations.
- j. Shoring and reshoring procedures.
- k. Methods for achieving specified floor and slab flatness and levelness.
- l. Floor and slab flatness and levelness measurements.
- m. Concrete repair procedures.
- n. Concrete protection.

#### 1.5 ACTION SUBMITTALS

##### A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Silica fume.
6. Performance-based hydraulic cement
7. Aggregates.
8. Admixtures:
  - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
9. Vapor retarders.
10. Floor and slab treatments.
11. Curing materials.
  - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
12. Joint fillers.
13. Repair materials.

##### B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.

10. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
11. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
12. Intended placement method.
13. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.

5. Silica fume.
6. Performance-based hydraulic cement.
7. Aggregates.
8. Admixtures:
  - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.
- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.
- E. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
- F. Preconstruction Test Reports: For each mix design.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as a ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.
  1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.
  1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated, and employing an ACI-certified Concrete Quality Control Technical Manager.
  1. Personnel performing laboratory tests shall be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Field Quality Control Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
  1. Personnel conducting field tests shall be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

1.8 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
  - 1. Include the following information in each test report:
    - a. Admixture dosage rates.
    - b. Slump.
    - c. Air content.
    - d. Seven-day compressive strength.
    - e. 28-day compressive strength.
    - f. Permeability.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94 and ACI 301.

1.10 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1 and as follows.
  - 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 3. Do not use frozen materials or materials containing ice or snow.
  - 4. Do not place concrete in contact with surfaces less than 35 deg F , other than reinforcing steel.
  - 5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1 , and as follows:
  - 1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
  - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
2. Obtain aggregate from single source.
3. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150, Type I, Type IA, gray
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595, Type IS, portland blast-furnace slag cement.
5. Silica Fume: ASTM C1240 amorphous silica.
6. Performance-Based Hydraulic Cement: ASTM C1157: Type GU, general use.

C. Normal-Weight Aggregates: ASTM C33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:
  - a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.
  - b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
  - c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
2. Maximum Coarse-Aggregate Size: 1 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.

1. Water-Reducing Admixture: ASTM C494, Type A.
2. Retarding Admixture: ASTM C494, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.
7. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494, Type C.
8. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

9. Permeability-Reducing Admixture: ASTM C494, Type S, hydrophilic, permeability-reducing crystalline admixture, capable of reducing water absorption of concrete exposed to hydrostatic pressure (PRAH).
  - a. Permeability: No leakage when tested in accordance with U.S. Army Corps of Engineers CRC C48 at a hydraulic pressure of 200 psi for 14 days.

F. Water and Water Used to Make Ice: ASTM C94, potable.

## 2.1 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with maximum water-vapor permeance of 0.0098. Include manufacturer's recommended adhesive or pressure-sensitive tape.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Insulation Solutions, Inc.; Viper VaporCheck II 15 mil.
  - b. Meadows, W. R., Inc.; Perminator 15 mil.
  - c. Stego Industries, LLC; Stego Wrap 15 mil Class A.

## 2.2 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:
  - a. Ambient Temperature Below 50 deg F : Black.
  - b. Ambient Temperature between 50 deg F and 85 deg F : Any color.
  - c. Ambient Temperature Above 85 deg F : White.

D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Dayton Superior; Clear Resin Cure J11W.
  - b. Euclid Chemical Company (The), an RPM company; Kurez DR VOX.
  - c. Meadows, W. R., Inc.; 1100-CLEAR.

E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. BASF Construction Chemicals - Building Systems; Kure 1315.
  - b. Dayton Superior Corporation; Cure & Seal 1315 J22WB.
  - c. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX.
  - d. Meadows, W. R., Inc.; VOCOMP-30.

2.3 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 or aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 in accordance with ASTM D2240.
- C. Bonding Agent: ASTM C1059, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Floor Slab Protective Covering: Eight-feet- wide cellulose fabric.

2.4 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C150 portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
  - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand, as recommended by underlayment manufacturer.
  - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C150 portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
  - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
  - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109.

2.5 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  1. Fly Ash or Other Pozzolans: 25 percent by mass.
  2. Slag Cement: 50 percent by mass.
  3. Silica Fume: 10 percent by mass.
  4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
  5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
  1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, and concrete with a w/cm below 0.50.
  4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
  5. Use permeability-reducing admixture in concrete mixtures where indicated.
- D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

## 2.6 CONCRETE MIXTURES

- A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.
  1. Exposure Class: ACI 318 F2
  2. Minimum Compressive Strength: 3000 psi at 28 days.
  3. Maximum w/cm: 0.45 .
  4. Slump Limit: 4 inches, plus or minus 1 inch .
  5. Air Content:
    - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch nominal maximum aggregate size.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- B. Class B: Normal-weight concrete used for foundation walls.
  1. Exposure Class: ACI 318 F2.
  2. Minimum Compressive Strength: 3000 psi 28 days.
  3. Maximum w/cm: 0.45 .
  4. Slump Limit: 4 inches, plus or minus 1 inch .
  5. Air Content:

- a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- C. Class C: Normal-weight concrete used for interior slabs-on-ground.
1. Exposure Class: ACI 318 F0.
  2. Minimum Compressive Strength: 4000 psi at 28 days.
  3. Maximum w/cm: 0.45
  4. Minimum Cementitious Materials Content: 520 lb/cu. yd.
  5. Slump Limit: 4 inches , plus or minus 1 inch
  6. Air Content:
    - a. Do not use an air-entraining admixture or allow total air content to exceed 3 percent for concrete used in trowel-finished floors.
  7. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
  8. Include concrete water vapor reducing admixture as specified in Section 030513.
- D. Class D: Normal-weight concrete used for exterior stoops and slabs on grade.
1. Exposure Class: ACI 318 F2.
  2. Minimum Compressive Strength: 5000 psi at 28 days.
  3. Maximum w/cm: 0.40 .
  4. Slump Limit: 4 inches , plus or minus 1 inch
  5. Air Content:
    - a. Exposure Classes F2 and F3: 6 percent, plus or minus 1.5 percent at point of delivery for concrete containing 1-inch .
  6. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

## 2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94, ASTM C1116, and furnish batch ticket information.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94. Mix concrete materials in appropriate drum-type batch machine mixer.
  1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
  2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd. .
  3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 INSTALLATION OF VAPOR RETARDER

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches , sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.
5. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.
  - a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.4 JOINTS

A. Construct joints true to line, with faces perpendicular to surface plane of concrete.

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
  2. Place joints perpendicular to main reinforcement.
    - a. Continue reinforcement across construction joints unless otherwise indicated.
    - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
  3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  6. Space vertical joints in walls as indicated on Drawings. Unless otherwise indicated on Drawings, locate vertical joints beside piers integral with walls, near corners, and in concealed locations where possible.
  7. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  8. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch . Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
  2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
  2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- 3.5 CONCRETE PLACEMENT
- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
  2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
1. If a section cannot be placed continuously, provide construction joints as indicated.
  2. Deposit concrete to avoid segregation.
  3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
    - a. Do not use vibrators to transport concrete inside forms.
    - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Do not place concrete floors and slabs in a checkerboard sequence.
  2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  3. Maintain reinforcement in position on chairs during concrete placement.
  4. Screed slab surfaces with a straightedge and strike off to correct elevations.
  5. Level concrete, cut high areas, and fill low areas.
  6. Slope surfaces uniformly to drains where required.
  7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
  8. Do not further disturb slab surfaces before starting finishing operations.

### 3.6 FINISHING FORMED SURFACES

- A. As-Cast Surface Finishes:

1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
  - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
  - b. Remove projections larger than 1 inch .
  - c. Tie holes do not require patching.
  - d. Surface Tolerance: ACI 117 Class D.
  - e. Apply to concrete surfaces not exposed to public view.
  
2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
  - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
  - b. Remove projections larger than 1/4 inch .
  - c. Patch tie holes.
  - d. Surface Tolerance: ACI 117 Class B.
  - e. Locations: Apply to concrete surfaces to be covered with a coating or covering material applied directly to concrete.
  
3. ACI 301 Surface Finish SF-3.0:
  - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
  - b. Remove projections larger than 1/8 inch .
  - c. Patch tie holes.
  - d. Surface Tolerance: ACI 117 Class A.
  - e. Locations: Apply to concrete surfaces exposed to public view.

B. Related Unformed Surfaces:

1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of 1/4 inch in one direction.
3. Apply scratch finish to surfaces to receive concrete floor toppings and to receive mortar setting beds for bonded cementitious floor finishes.

C. Float Finish:

1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.

3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface.
5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
7. Finish surfaces to the following tolerances, in accordance with ASTM E1155, for a randomly trafficked floor surface:

a. Slabs on Ground:

- 1) Specified overall values of flatness,  $F_F$  25; and of levelness,  $F_L$  20; with minimum local values of flatness,  $F_F$  17; and of levelness,  $F_L$  15.
  - 2) Specified overall values of flatness,  $F_F$  35; and of levelness,  $F_L$  25; with minimum local values of flatness,  $F_F$  24; and of levelness,  $F_L$  17.
  - 3) Specified overall values of flatness,  $F_F$  45; and of levelness,  $F_L$  35; with minimum local values of flatness,  $F_F$  30; and of levelness,  $F_L$  24.
  - 4) Specified Overall Value (SOV):  $F_F$  50 and  $F_L$  25 with minimum local value (MLV):  $F_F$  40 and  $F_L$  17.
  - 5) Specified Overall Value (SOV):  $F_F$  25 and  $F_L$  20 with minimum local value (MLV):  $F_F$  17 and  $F_L$  15.
8. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch .

E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.

1. Coordinate required final finish with Architect before application.
2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.8 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
  2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
  3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.
  2. Construct concrete bases 4 high unless otherwise indicated on Drawings, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated on Drawings, or unless required for seismic anchor support.
  3. Minimum Compressive Strength: 4000 psi at 28 days.
  4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
  5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
  6. Prior to pouring concrete, place and secure anchorage devices.
    - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
    - b. Cast anchor-bolt insert into bases.
    - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

### 3.9 CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
  2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply in accordance with manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
  2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
  3. If forms remain during curing period, moist cure after loosening forms.
  4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
    - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
    - b. Continuous Sprinkling: Maintain concrete surface continuously wet.

- c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
- d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
- e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
  - 2) Maintain continuity of coating and repair damage during curing period.

D. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

- 1. Begin curing immediately after finishing concrete.
- 2. Interior Concrete Floors:
  - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
    - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
      - a) Lap edges and ends of absorptive cover not less than 12-inches.
      - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
    - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive.
      - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
      - b) Cure for not less than seven days.
    - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
      - a) Water.
      - b) Continuous water-fog spray.
  - b. Floors to Receive Curing Compound:
    - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
    - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
    - 3) Maintain continuity of coating, and repair damage during curing period.
    - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
  - c. Floors to Receive Curing and Sealing Compound:

- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
- 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
- 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

### 3.10 TOLERANCES

- A. Conform to ACI 117.

### 3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

### 3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least six months.
  2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

### 3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
  1. Repair and patch defective areas when approved by Architect.
  2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
    - a. Limit cut depth to 3/4 inch.
    - b. Make edges of cuts perpendicular to concrete surface.
    - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
    - d. Fill and compact with patching mortar before bonding agent has dried.

- e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
    - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    - b. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
    - a. Correct low and high areas.
    - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
  2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  3. After concrete has cured at least 14 days, correct high areas by grinding.
  4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
    - a. Finish repaired areas to blend into adjacent concrete.
  5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
    - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
    - b. Feather edges to match adjacent floor elevations.
  6. Correct other low areas scheduled to remain exposed with repair topping.
    - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
    - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
    - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
    - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
    - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
    - d. Place, compact, and finish to blend with adjacent finished concrete.
    - e. Cure in same manner as adjacent concrete.
  8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.

- a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
  - b. Dampen cleaned concrete surfaces and apply bonding agent.
  - c. Place patching mortar before bonding agent has dried.
  - d. Compact patching mortar and finish to match adjacent concrete.
  - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
1. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  2. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
    - a. Test reports shall include reporting requirements of ASTM C31/C31M and ASTM C39/C39M, including the following as applicable to each test and inspection:
      - 1) Project name.
      - 2) Name of testing agency.
      - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
      - 4) Name of concrete manufacturer.
      - 5) Date and time of inspection, sampling, and field testing.
      - 6) Date and time of concrete placement.
      - 7) Location in Work of concrete represented by samples.
      - 8) Date and time sample was obtained.
      - 9) Truck and batch ticket numbers.
      - 10) Design compressive strength at 28 days.
      - 11) Concrete mixture designation, proportions, and materials.
      - 12) Field test results.
      - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
      - 14) Type of fracture and compressive break strengths at seven days and 28 days.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
1. Headed bolts and studs.
  2. Verification of use of required design mixture.

3. Concrete placement, including conveying and depositing.
  4. Curing procedures and maintenance of curing temperature.
  5. Verification of concrete strength before removal of shores and forms from beams and slabs.
  6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. Slump: ASTM C143:
    - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
    - b. Perform additional tests when concrete consistency appears to change.
  3. Air Content: ASTM C231 pressure method, for normal-weight concrete.
    - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  4. Concrete Temperature: ASTM C1064:
    - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
  5. Compression Test Specimens: ASTM C31:
    - a. Cast and laboratory cure two sets of three 6-inch by 12-inch cylinder specimens for each composite sample.
    - b. Cast and field cure two sets of three standard cylinder specimens for each composite sample.
  6. Compressive-Strength Tests: ASTM C39:
    - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
    - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
    - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi, if specified

compressive strength is 5000 psi, or no compressive strength test value is less than 1 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests:
  - a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
  - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by Architect.
    - 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

- F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 24 hours of completion of floor finishing and promptly report test results to Architect.

### 3.15 PROTECTION

- A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Clay face brick.
  - 3. Mortar and grout.
  - 4. Masonry-joint reinforcement.
  - 5. Ties and anchors.
  - 6. Embedded flashing.
  - 7. Miscellaneous masonry accessories.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  - 1. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
- C. Samples for Initial Selection: For each type and color of the following:
  - 1. Clay face brick, in the form of straps of five or more bricks.

1.5 INFORMATIONAL SUBMITTALS

- A. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
  - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

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

### 2.2 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### 2.3 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide bullnose units for outside corners unless otherwise indicated.
- B. CMUs: ASTM C 90.
  - 1. Density Classification: Normal weight.
  - 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
  - 3. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

### 2.4 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
  - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
  - 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Clay Face Brick: Facing brick complying with ASTM C 216.

1. Grade: SW.
2. Type: FBX.
3. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.
4. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
5. Size (Actual Dimensions): Modular - 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
6. Application: Use where brick is exposed unless otherwise indicated.
7. Provide face brick matching color range, texture, and size of existing adjacent brickwork, as approved by the Architect.
  - a. Basis of Design Match: Contractor shall provide three matching samples in field for selection by Architect.

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

E. Aggregate for Grout: ASTM C 404.

F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Euclid Chemical Company (The); Accelguard 80.
  - b. Grace Construction Products, W. R. Grace & Co. - Conn.; Morset.
  - c. BASF Corporation, Building Systems; Trimix-NCA.

G. Water: Potable.

## 2.6 REINFORCEMENT

- A. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.
  - 1. Interior Walls: Hot-dip galvanized carbon steel.
  - 2. Exterior Walls: Hot-dip galvanized carbon steel.
  - 3. Wire Size for Side Rods: 0.148-inch diameter.
  - 4. Wire Size for Cross Rods: 0.148-inch diameter.
  - 5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
  - 6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
  
- B. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

## 2.7 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
  
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
  - 2. Galvanized-Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 zinc coating.
  
- C. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
  - 1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire.
  - 2. Tie Section: Triangular-shaped wire tie made from 0.187-inch- diameter, hot-dip galvanized steel wire.
  
- D. Stabilization/Shear Anchor: Galvanized steel anchor that allows for load transfer across control joints and inhibits lateral movement. Resists out-of-plane shear forces while allowing for in-plane movement of the masonry. Provide one of the following:
  - 1. Heckmann Building Products, Inc.; No. 353 Debonded shear anchor.
  - 2. Hohmann & Barnard, Inc.; Slip-Set Stabilizer.
  - 3. Wirebond; No 1700 Control Joint Anchor
  
- E. Adjustable Masonry-Veneer Anchors:
  - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
  - 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.105-inch- thick steel sheet, galvanized after fabrication.
  - 3. Fabricate wire ties from 0.25-inch- diameter, hot-dip galvanized-steel wire unless otherwise indicated.

4. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a sheet metal anchor section, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom and with raised rib-stiffened strap, 5/8 inch wide by 3-5/8 inches long, stamped into center to provide a slot between strap and base for inserting wire tie.
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) Heckmann Building Products Inc.; 315-D with 316.
    - 2) Hohmann & Barnard, Inc.; DW-10HS.
    - 3) Wire-Bond; 1004, Type III.
5. Provide polymer-coated, steel expansion anchors to fasten sheet metal anchor sections to cmu backup..

## 2.1 EMBEDDED FLASHING MATERIALS

### A. Flexible Flashing: Use the following unless otherwise indicated:

1. Stainless Steel Flashing: Composite flashing product consisting of a stainless-steel core with one uncoated (bare) stainless steel face (outward facing) with a butyl block co-polymer adhesive (inward facing).
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) York Manufacturing, Inc.; York 304 SS.
    - 2) Illinois Products, Inc.; IPCO Self-Adhesive Stainless Steel.
    - 3) STS Coatings, Inc.; Wall Guardian Self Adhering Stainless Steel Flashing.
  - b. Stainless steel: type 304, ASTM A240.
  - c. Adhesive: block co-polymer.
  - d. Polyether sealant
    - 1) York Manufacturing, Inc.; UniverSeal US-100.
    - 2) STS Coatings; GreatSeal LT-100.
    - 3) Prosoco, Inc.; R-Guard Joint Seam Sealer.
  - e. Splice Tape
    - 1) York Manufacturing, Inc.; York 304 SS.
    - 2) Illinois Products, Inc.; IPCO Self-Adhering Stainless-Steel Flashing.
  - f. Corner and End Dams: form the stainless-steel flashing in the field or use 26-gauge stainless steel pre-manufactured corners.
  - g. Termination Bar: Rigid PVC or stainless-steel termination bar with sealant catch lip

## 2.2 MISCELLANEOUS MASONRY ACCESSORIES

- ### A. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Products: Subject to compliance with requirements, provide one of the following:

- a. Heckmann Building Products Inc.; #84 Wall Defender.
  - b. Hohmann & Barnard, Inc.; Mortar Trap.
  - c. Mortar Net USA, Ltd.; Mortar Net.
  - d. York Flashing; Weep-Armor.
2. Configuration: Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings. Provide multiple layers if necessary to fill full width of cavity.

### 2.3 MASONRY CLEANERS

- A. Proprietary Non-Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Diedrich Technologies, Inc.
    - b. EaCo Chem, Inc.
    - c. ProSoCo, Inc.

### 2.4 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
  2. Use portland cement-lime mortar unless otherwise indicated.
  3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
1. For all masonry, use Type N.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  2. Verify that foundations are within tolerances specified.

3. Verify that reinforcing dowels are properly placed.
  4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
  2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
  4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
  1. Install compressible filler in joint between top of partition and underside of structure above.
  2. Unless otherwise indicated, fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.

3. Wedge nonload-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078446 "Fire-Resistive Joint Systems."

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
  1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  2. Bed webs in mortar in grouted masonry, including starting course on footings.
  3. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

### 3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together using adjustable masonry veneer anchors.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
  1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### 3.7 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
  1. Space reinforcement not more than 16 inches o.c.
  2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### 3.8 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, head of wall cavities, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape.
  - 2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within 1/2 inch of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches on interior face.
  - 3. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under, lapping at least 4 inches.
  - 4. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
  - 1. Use open-head joints to form weep holes.
  - 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- E. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use open-head joints to form cavity vents.

### 3.9 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
6. Clean masonry with a proprietary non-acidic cleaner applied according to manufacturer's written instructions.
7. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

END OF SECTION 042000

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Wood blocking and backing.
  - 2. Plywood backing panels.

1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
  - 2. NLGA: National Lumber Grades Authority.
  - 3. SPIB: The Southern Pine Inspection Bureau.
  - 4. WCLIB: West Coast Lumber Inspection Bureau.
  - 5. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

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

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.
- C. MDF: ANSI A208.2, Grade 130, made with binder containing no urea-formaldehyde resin.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- 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. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
  - 3. 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 D2898. 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 testing and inspecting agency acceptable to authorities having jurisdiction.

E. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.
2. Plywood backing panels.
3. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.

### 2.3 MISCELLANEOUS LUMBER

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

1. Blocking.
2. Nailers.
3. Cants.

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

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north), Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir, Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

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

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

F. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade: Alder, aspen, basswood, cottonwood, gum, magnolia, soft maple, sycamore, tupelo, or yellow poplar; B Finish or better; NHLA.
2. Maximum Moisture Content: 13 percent.
3. Finger Jointing: Allowed.
4. Face Surface: Surfaced (smooth).
5. Ease exposed edges.

### 2.4 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior, BC, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.5 FASTENERS AND HARDWARE

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.
- F. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081 BHMA A156.9, B04102; with shelf brackets, B04112.
- G. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- G. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

- H. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
- I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

### 3.3 PROTECTION

- A. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Polyisocyanurate foam-plastic board.
  - 2. Glass-fiber blanket.
- B. Related Requirements:
  - 1. For sound attenuation blanket used as acoustic insulation.

1.3 ACTION SUBMITTALS

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

1.4 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, Foil Faced: ASTM C1289, foil faced, Type I, Class 1 or 2.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Atlas EPS; a Division of Atlas Roofing Corporation.
- b. Carlisle Coatings & Waterproofing Inc.
- c. Dow Chemical Company (The).
- d. Firestone Building Products.
- e. Hunter Panels.
- f. Rmax, Inc.

2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

## 2.2 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced: ASTM C665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation.
    - b. Johns Manville; a Berkshire Hathaway company.
    - c. Knauf Insulation.
    - d. Owens Corning.

## 2.3 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
  1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- C. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

## PART 3 - EXECUTION

### 3.1 PREPARATION

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

### 3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

### 3.3 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer.
  - 1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
  - 2. Press units firmly against inside substrates.
  - 3. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042000 "Unit Masonry."

### 3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
  - 4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
  - 5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
    - a. Exterior Walls: Set units with facing placed toward interior of construction.
- B. Loose-Fill Insulation: Apply according to ASTM C1015 and manufacturer's written instructions. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

### 3.5 PROTECTION

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

END OF SECTION 072100

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Asphalt shingles.
- 2. Underlayment.
- 3. Ridge vents.
- 4. Metal flashing and trim.

- B. Related Requirements:

- 1. Section 076200 "Sheet Metal Flashing and Trim."

1.3 DEFINITION

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
  - 1. Asphalt Shingles: Full size.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's warranty.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Asphalt Shingles: 100 sq. ft. of each type, in unbroken bundles.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
- C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.11 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Manufacturing defects.
  - 2. Material Warranty Period: Limited Lifetime Warranty prorated, with first 10 years nonprorated.
  - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 110 mph for five years from date of Substantial Completion.
  - 4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.
  - 5. Workmanship Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
1. Basis-of-Design Product: Subject to compliance with requirements, provide **Certainteed Landmark IR** - or alternate product exhibiting comparable or better performance and aesthetics by one of the following that has been pre-approved during the bidding process and included into the bidding documents by Addendum:
    - a. GAF Materials Corporation.
    - b. Owens Corning.
  2. Butt Edge: Straight cut.
  3. Strip Size: Manufacturer's standard.
  4. Algae Resistance: Granules resist algae discoloration.
  5. Color and Blends: As selected by the Architect from Manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970/D 1970M, minimum of 40-mil-thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release backing; cold applied
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Atlas Roofing Corporation.
    - b. Carlisle Residential; a division of Carlisle Construction Products.
    - c. CertainTeed Corporation.
    - d. Grace, W. R. & Co. - Conn.
    - e. Owens Corning.

2.4 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Certaineed Ridge Vent.
2. Minimum Net Free Area: 18 sq.m in. per linear foot.
3. Width: 12 inch.
4. Thickness: Manufacturer's standard.
5. Features:
  - a. Nonwoven geotextile filter strips.
  - b. External deflector baffles.

## 2.5 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- diameter, sharp-pointed, with a minimum 3/8-inch- diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
  1. Shank: Smooth.
  2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

## 2.6 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  1. Sheet Metal:
    - a. Zinc-tin alloy-coated steel.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
  1. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet with 1-inch- high, inverted-V profile at center of valley and equal flange widths of 12 inches.
  2. Drip Edges: re-use existing where possible; provide new to match existing if existing are not usable. Refer to Section 076200.
- C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches from pipe onto roof.

## 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.
  1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.

2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.

- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.
  1. Provide self-adhering sheet underlayment over entire roof surface.
- C. Concealed Valley Lining: For woven valleys. Comply with NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems." Install underlayment centered in valley and fastened to roof deck.
  1. Lap roof-deck underlayment over valley underlayment at least 6 inches.
  2. Install a full-width sheet of synthetic underlayment centered in valley. Lap ends of strips at least 12 inches in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck.

### 3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- D. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

### 3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed with self-sealing strip face up at roof edge.
  1. Extend asphalt shingles 3/4 inch over fasciae at eaves and rakes.

2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
  - D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
  - E. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
    1. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
    2. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.
  - F. Woven Valleys: Extend succeeding asphalt-shingle courses from both sides of valley 12 inches beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
    1. Do not nail asphalt shingles within 6 inches of valley center.
  - G. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
  - H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
    1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

- 1. Manufactured reglets with counterflashing.
- 2. Formed low-slope roof sheet metal fabrications.

B. Related Requirements:

- 1. Section 061053 Miscellaneous Rough Carpentry for wood nailers, curbs, and blocking.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each of the following

- 1. Underlayment materials.
- 2. Elastomeric sealant.
- 3. Butyl sealant.
- 4. Epoxy seam sealer.

B. Shop Drawings: For sheet metal flashing and trim.

- 1. Include plans, elevations, sections, and attachment details.
- 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
- 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
- 4. Include details for forming, including profiles, shapes, seams, and dimensions.
- 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
- 6. Include details of termination points and assemblies.

7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

- C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
  2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

#### 1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  2. Finish Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

## 2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

- 1. Exposed Coil-Coated Finish:

- a. Metallic Fluoropolymer: AAMA 2605. Three-coat fluoropolymer finish with suspended metallic flakes containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

- 2. Color: As selected by Architect from manufacturer's full range.
    - 3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

- C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.

- 1. Finish: ASTM A480/A480M, No. 2D (dull, cold rolled).

## 2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with underlayment manufacturer's written instructions.

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Carlisle Residential; a division of Carlisle Construction Materials.
    - b. Henry Company.
    - c. Owens Corning.
    - d. Protecto Wrap Company.

- 2. Source Limitations: Obtain underlayment from single source from single manufacturer.
    - 3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.

- C. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

#### 2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
  - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  - 3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329.
- C. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- E. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- F. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Fry Reglet Corporation.
    - b. Heckmann Building Products, Inc.
    - c. Hickman Company, W. P.
    - d. Hohmann & Barnard, Inc.
  - 2. Source Limitations: Obtain reglets from single source from single manufacturer.
  - 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
  - 4. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.
  - 5. Finish: With manufacturer's standard color coating.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
  - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
  - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
  
- B. Fabrication Tolerances:
  - 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
  - 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
  
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
  - 2. Use lapped expansion joints only where indicated on Drawings.
  
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
  
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
  
- F. Seams:
  - 1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
  - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.
  
- G. Do not use graphite pencils to mark metal surfaces.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long sections. Furnish with 6-inch- wide, joint cover plates.
  - 1. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate and exposed cover plate.
  - 2. Fabricate from the following materials:
    - a. Aluminum: 0.050 inch thick.

- B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, and weld watertight. Shop fabricate interior and exterior corners.
1. Coping Profile: in accordance with SMACNA's "Architectural Sheet Metal Manual."
  2. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate and 6-inch-wide, exposed cover plate.
  3. Fabricate from the following materials:
    - a. Aluminum: 0.050 inch thick.
- C. Roof-to-Wall Transition Expansion-Joint Cover: Fabricate from the following materials:
1. Aluminum: 0.050 inch thick.
- D. Base Flashing: Fabricate from the following materials:
1. Aluminum: 0.040 inch thick.
- E. Counterflashing: Fabricate from the following materials:
1. Aluminum: 0.032 inch thick.
- F. Flashing Receivers: Fabricate from the following materials:
1. Aluminum: 0.032 inch thick.
- G. Roof-Drain Flashing: Fabricate from the following materials:
1. Stainless Steel: 0.0156 inch thick.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
1. Install in shingle fashion to shed water.

2. Lap joints not less than 2 inches.

B. Self-Adhering, High-Temperature Sheet Underlayment:

1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
2. Prime substrate if recommended by underlayment manufacturer.
3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses.
5. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller.
6. Roll laps and edges with roller.
7. Cover underlayment within 14 days.

C. Install slip sheet, wrinkle free, directly on substrate before installing sheet metal flashing and trim.

1. Install in shingle fashion to shed water.
2. Lapp joints not less than 4 inches.

3.3 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim true to line, levels, and slopes.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
8. Do not field cut sheet metal flashing and trim by torch.
9. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of uncoated-aluminum stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
2. Use lapped expansion joints only where indicated on Drawings.

- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
  - 1. Use sealant-filled joints unless otherwise indicated.
    - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
    - b. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
    - c. Adjust setting proportionately for installation at higher ambient temperatures.
      - 1) Do not install sealant-type joints at temperatures below 40 deg F.
  - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

### 3.4 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
  - 1. Join sections with joints sealed with sealant.
  - 2. Provide for thermal expansion.
  - 3. Attach gutters at eave or fascia to firmly anchor them in position.
  - 4. Provide end closures and seal watertight with sealant.
  - 5. Slope to downspouts.
  - 6. Fasten gutter spacers to front and back of gutter.
  - 7. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
  - 8. Anchor gutter with straps spaced not more than 36 inches apart to roof deck unless otherwise indicated, and loosely lock to front gutter bead.
- C. Downspouts:
  - 1. Join sections with 1-1/2-inch telescoping joints.
  - 2. Provide hangers with fasteners designed to hold downspouts securely to walls.
  - 3. Locate hangers at top and bottom and at approximately 60 inches o.c.
  - 4. Provide elbows at base of downspout to direct water away from building.
  - 5. Connect downspouts to underground drainage system.
- D. Splash Bocks:
  - 1. Precast concrete splash blocks, minimum 36 inches long
- E. Parapet Scuppers:
  - 1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

2. Anchor scupper closure trim flange to exterior wall and make watertight at scupper.
  3. Loosely lock front edge of scupper with conductor head.
  4. Seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.
- F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below scupper or gutter discharge.
- G. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

### 3.5 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
  2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing:
1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
  2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Copings:
1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
  2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated.
    - a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
    - b. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.
- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
  2. Extend counterflashing 4 inches over base flashing.
  3. Lap counterflashing joints minimum of 4 inches.
  4. Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.

### 3.6 INSTALLATION OF WALL FLASHINGS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.7 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.

3.9 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

B. Related Sections:

1. Section 078446 "Fire-Resistive Joint Systems" for joints in or between fire-resistance-rated construction, at exterior curtainwall/floor intersections, and in smoke barriers.

1.3 ACTION SUBMITTALS

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

- B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 MOCKUPS

- A. Mockups: Build mockups of each firestop application to set quality standards for installation.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
  - 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
    - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
    - b. Classification markings on penetration firestopping correspond to designations listed by the following:
      - 1) UL in its "Fire Resistance Directory."
- C. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.
- C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product listed under each "Fill Material" type or comparable product by one of the following:
1. A/D Fire Protection Systems Inc.
  2. Hilti, Inc.
  3. Specified Technologies Inc.

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
1. Fire-resistance-rated walls include fire walls, fire-barrier walls, smoke-barrier walls, and fire partitions.
  2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
1. Horizontal assemblies include, but are not limited to, floors.
  2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
  3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
- E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
1. Permanent forming/damming/backing materials, including the following:
    - a. Slag-wool-fiber or rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  2. Temporary forming materials.
  3. Substrate primers.

4. Collars.
5. Steel sleeves.

### 2.3 FILL MATERIALS

- A. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
  1. Basis of Design: Hilti CFS-SP WB Firestop Joint Spray.
- B. Cast-In-Place Firestop Devices: Factory-assembled collars formed from plastic and lined with intumescent material sized to fit specific diameter of penetrant.
  1. Basis of Design: Hilti CP-680-P or CP-680-M Cast-In Device and appropriate accessories as applicable.
- C. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
  1. Basis of Design: Hilti CP 617 Putty Pad, CP 619 Putty Roll, and CP 618 Putty Stick.
- D. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
  1. Basis of Design: Hilti CP 648-S and 648-E Wrap Strips.
- E. Block: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
  1. Basis of Design: Hilti FS 657 Fire Block.
- F. Two Component Polyurethane Foam: Multicomponent, polyurethane-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
  1. Basis of Design: Hilti CP 620 Fire Foam.
- G. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
  1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.
  2. Basis of Design: Hilti CP 601s and CP 604 self-leveling sealant.
- H. Post Installed Firestop Devices: For use with noncombustible and combustible pipes (closed and open systems) and conduit penetrating concrete floors.
  1. Basis of Design: Hilti CFS-DID Drop-In Firestop Device.
- I. Cable Management Device: Re-penetrable cable management device for floor or wall applications.
  1. Basis of Design: Hilti CP 653 Speed Sleeve.

- J. Intumescent Sealants: Intumescent sealant that helps protect combustible and non-combustible penetrations.
  - 1. Basis of Design: Hilti FS-One.
- K. Acrylic Sealants: Acrylic based firestop sealant that provides movement capacity in penetrations and joints.
  - 1. Basis of Design: Hilti CP 606.
- L. Firestop Collars: Ready-to-use firestop collar, made of galvanized steel housing and intumescent inserts for firestopping large combustible pipes.
  - 1. Basis of Design: Hilti CP 644 and CP 643N.
- M. Firestop Plug: Ready-to-use intumescent and reusable plug for small openings.
  - 1. Basis of Design: Hilti CP 658T Firestop Plug.
- N. Outlet and Switch Box Protection: Ready-to-use intumescent insert to provide protection to outlet and switch boxes in fire rated assemblies.
- O. Basis of Design: Hilti Firestop Box Insert.
- P. Firestop Board: Ready-to-use firestop board designed for large opening with cable trays and multiple penetrations.
  - 1. Basis of Design: Hilti CP 675T.

## 2.4 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
  2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
  3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

### 3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
  2. Contractor's name, address, and phone number.
  3. Designation of applicable testing and inspecting agency.
  4. Date of installation.
  5. Manufacturer's name.
  6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- B. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

3.7 BASIS OF DESIGN SYSTEMS FOR THROUGH PENETRATIONS

Description	Concrete Floor / Block Walls	Gypsum Walls	Hollow Core Floors	Wood Floors	Gypsum Shaft Walls
Blank opening	CAJ-0090 FA-0014	WL-0040	** see note		
Metal pipe	CAJ-1226 FA-1016	WL-1054 WL-1297	CAJ-1184 CBJ-1046	FC-1009 FC-1106	WL-1206 WL-1380
Plastic Pipe	CAJ-2109 FA-2054 WJ-2109	WL-1078 WL-2128	CAJ-2567	FC-2389	
Cable Bundle	CAJ-3180 CAJ-3193 FA-3007	WL-3065 WL-3334	CBJ-3024	FC-3012 FC-3074	WL-3161
Metal pipe with glass fiber insulation	CAJ-5091 FA-5042 FA-5017	WL-5029 WL-5257	CBJ-5013	FC-5036 FC-5066	WL-5244
Metal pipe with AB/PVC insulation	CAJ-5090 FA-5032 FA-5015	WL-5028	** see note	FC-5004 FC-5065	WL-5143
Sheet metal duct (rectangular)	CAJ-7084 CAJ-7051	WL-7155 WL-7059	** see note		
Sheet metal duct (round)	CAJ-7084	WL-7042 WL-7153	** see note	FC-7013 FC-7025	
Multiple penetrants	CAJ-8099 FA-8012 FA-1022	WL-8079 WL-8071	** see note		

\*Note: Systems provided are for guidance. Contractor to submit final UL system based on actual field conditions

\*\*Note: refer to the "UL XHEZ Through Penetration Guidelines" for additional use of systems

END OF SECTION 078413

SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Joints in or between fire-resistance-rated constructions.
- 2. Joints in smoke barriers.

- B. Related Sections:

- 1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each fire-resistive joint system. Include location and design designation of qualified testing agency.
  - 1. Where Project conditions require modification to a qualified testing agency's illustration for a particular fire-resistive joint system condition, submit illustration, with modifications marked, approved by fire-resistive joint system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
- B. Installer Qualifications: A firm experienced in installing fire-resistive joint systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its fire-resistive joint system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- C. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:

1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
  - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
  - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
    - 1) UL in its "Fire Resistance Directory."

D. Preinstallation Conference: Conduct conference at Project site.

#### 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

#### 1.6 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

### PART 2 - PRODUCTS

#### 2.1 FIRE-RESISTIVE JOINT SYSTEMS

- A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:
  1. Joints include those installed in or between fire-resistance-rated walls and floor or floor/ceiling assemblies.
  2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.

3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. A/D Fire Protection Systems Inc.
  - b. Hilti, Inc.
  - c. Specified Technologies Inc.
- C. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- D. VOC Content: Provide fire-resistive joint systems that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Porous Substrates: 775 g/L.
- E. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
  2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
  3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

### 3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
  - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
  - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  - 1. The words "Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Designation of applicable testing agency.
  - 4. Date of installation.
  - 5. Manufacturer's name.
  - 6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.
- B. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

### 3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.

- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

3.7 BASIS OF DESIGN SYSTEMS FOR CONSTRUCTION JOINTS

<b>Gypsum Walls</b>		<b>Concrete or CMU Walls</b>	
Perpendicular to Metal Deck	HWD-0042 HWD-1066 HWD-0045	Perpendicular to Metal Deck	HWD-1037 HWD-0081
Parallel to Metal Deck	HWD-0049 HWD-1067 HWD-0184	Parallel to Metal Deck	HWD-0181 HWD-0081
Flat Concrete	HWD-1068 HWD-0209	Flat Concrete	HWD-1058 HWD-0268
Cut to Profile	HWD-0324		
Shaft Wall to flat concrete	HWD-0342		

END OF SECTION 078446

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Nonstaining silicone joint sealants.
  - 2. Latex joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.4 QUALITY ASSURANCE

- A. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.5 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

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

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

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
  - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
  - 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### 2.2 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dow Corning Corporation; 756 SM.
    - b. GE Construction Sealants; SCS 9000.
    - c. Pecora; 864 NST.
    - d. Tremco Incorporated; Spectrem 3.

### 2.3 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. BASF Construction Chemicals, LLC, Building Systems; Sonolac.
    - b. Sherwin-Williams Company (The); 850A.
    - c. Tremco Incorporated; Tremflex 834.

## 2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Construction Chemicals, LLC, Building Systems.
    - b. Construction Foam Products, a division of Nomaco, Inc.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or Type O (open-cell material), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Use open-cell material at double caulk beads in vertical joints for curing of initial (internal) caulk bead.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Remove laitance and form-release agents from concrete.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

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

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

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

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

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

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

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

### 3.4 FIELD QUALITY CONTROL

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

1. Extent of Testing: Test completed and cured sealant joints as follows:
  - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
  - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
  - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect tested joints and report on the following:
  - a. Whether sealants filled joint cavities and are free of voids.
  - b. Whether sealant dimensions and configurations comply with specified requirements.
  - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

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

### 3.5 CLEANING

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

### 3.6 PROTECTION

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

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
  - 1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Joints between storefront framing.
    - c. Joints between different materials listed above.
    - d. Exterior sealant joints as indicated.
  - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
  
- B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
  - 1. Joint Locations:
    - a. Control joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints between interior wall surfaces and frames of interior doors.
    - c. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Acrylic latex.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Access doors and frames for walls and ceilings.

1.3 ALLOWANCES

- A. In addition to access doors shown on the drawings, include in base bid the provision of two (2) 30-inch x 30-inch access doors and frames of each type specified in this section.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details materials, individual components and profiles, and finishes.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Acudor Products, Inc.
  - 2. Elmdor/Stoneman Manufacturing Co.; Div. of Acorn Engineering Co.
  - 3. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
  - 4. Larsen's Manufacturing Company.
  - 5. Milcor Inc.
  - 6. Nystrom, Inc.
- B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- C. Flush Access Doors with Exposed Flanges:
  - 1. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
  - 2. Locations: Wall.

3. Door Size: 30-inch x 30 inch, unless otherwise indicated.
4. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage.
  - a. Finish: Factory finish.
5. Frame Material: Same material, thickness, and finish as door.
6. Hinges: Manufacturer's standard.
7. Hardware: Lock.

D. Flush Access Doors with Concealed Flanges:

1. Assembly Description: Fabricate door to fit flush to frame. Provide frame with gypsum board beads for concealed flange installation.
2. Locations: Wall and ceiling.
3. Door Size: 30-inch x 30-inch, unless otherwise indicated.
4. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage.
  - a. Finish: Factory finish.
5. Frame Material: Same material and thickness as door.
6. Hinges: Manufacturer's standard.
7. Hardware: Lock.

E. Hardware:

Wall access panels.

1. Lock: Cylinder.
  - a. Key all locks the same.

Ceiling Access panels.

2. Lock: Latch.
  - a. Quarter turn latch.

## 2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.
- C. Frame Anchors: Same type as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

## 2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  - 1. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
  - 2. Provide mounting holes in frames for attachment of units to metal framing.
  - 3. Provide mounting holes in frame for attachment of masonry anchors.

#### 2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Steel and Metallic-Coated-Steel Finishes:
  - 1. Factory Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry-film thickness of 1 mil for topcoat.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

#### 3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
  - 1. Non-load-bearing steel framing systems for interior gypsum board assemblies.
  - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.
- B. Related Requirements:
  - 1. Section 054000 "Cold-Formed Metal Framing" for heavy gauge metal framing.

1.3 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
  - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
  - 2. Protective Coating: Coating with equivalent corrosion resistance of ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645.

1. Steel Studs and Runners:
  - a. Minimum Base-Metal Thickness: 20 ga. or as indicated on Drawings.
  - b. Depth: 3-5/8 inches.
  
- C. Slip-Type Head Joints: Provide the following:
  1. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
  
- D. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
    - b. Grace Construction Products; FlameSafe FlowTrak System.
    - c. Metal-Lite, Inc.; The System.
  
- E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
  1. Minimum Base-Metal Thickness: 20 ga.
  2. Depth: As indicated on Drawings.
  
- F. Cold-Rolled Furring Channels: 18 ga. minimum uncoated-steel thickness, with minimum 1/2-inch- wide flanges.
  1. Depth: As indicated on Drawings.
  2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch.
  3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
  
- G. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.018 inch, and depth required to fit insulation thickness indicated.

## 2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
  
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
  
- C. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.053 inch and minimum 1/2-inch- wide flanges.
  1. Depth: 2 inches.
  
- D. Furring Channels (Furring Members):
  1. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.

- E. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Chicago Metallic Corporation; Drywall Grid System.
    - b. USG Corporation; Drywall Suspension System.

#### 2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
  - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
  - 1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
  - 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

#### 3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
  - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.

- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

### 3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
  - 1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
  - 2. Multilayer Application: 16 inches o.c. unless otherwise indicated.
  - 3. Tile Backing Panels: 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. Direct Furring:
  - 1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

### 3.5 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
  - 1. Carrying Channels (Main Runners): 48 inches o.c.
  - 2. Furring Channels (Furring Members): 16 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. Do not attach hangers to steel roof deck.
  5. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
  6. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. 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.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Interior gypsum board.

- B. Related Requirements:

- 1. Section 061600 "Sheathing" for gypsum sheathing for exterior walls.
- 2. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

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

1.4 QUALITY ASSURANCE

- A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

- 1. Install mockups for the following:

- a. Each level of gypsum board finish indicated for use in exposed locations.

- 2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
- 3. Simulate finished lighting conditions for review of mockups.
- 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned. At Contractor's discretion and at contractor's cost, fiberglass faced interior gypsum panels may be installed in areas which are yet to be enclosed and conditioned. Follow gypsum panel manufacturer's recommendations.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. CertainTeed Corp.
  - 2. Georgia-Pacific Gypsum LLC.
  - 3. National Gypsum Company.
  - 4. USG Corporation.
- B. Gypsum Board: ASTM C 1396/C 1396M.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. CertainTeed Corp.: "ProRoc Regular Gypsum Board."

- b. Georgia-Pacific Gypsum LLC.; "ToughRock Gypsum Board."
      - c. National Gypsum Company; "Gold Bond Gypsum Board."
      - d. USG Corporation; "Sheetrock Gypsum Panels."
    - 2. Thickness: 5/8 inch.
    - 3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
  - C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
    - 1. Products: Subject to compliance with requirements, provide one of the following:
      - a. CertainTeed Corp.; "ProRoc Type X Gypsum Board."
      - b. Georgia-Pacific Gypsum LLC.; "ToughRock Fireguard Gypsum Board."
      - c. National Gypsum Company; "Fire-Shield Gypsum Board."
      - d. USG Corporation; "Sheetrock Firecode Core Gypsum Panels."
    - 2. Thickness: 5/8 inch.
    - 3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
  - D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
    - 1. Thickness: 1/2 inch.
    - 2. Long Edges: Tapered.
- 2.4 GYPSUM BOARD FOR INTERIOR FACE OF EXTERIOR WALL (OR AS NOTED ON DRAWINGS)
  - A. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
    - 1. Products: Subject to compliance with requirements, provide one of the following:
      - a. CertainTeed Corp.; "GlasRoc."
      - b. Georgia-Pacific Gypsum LLC; DensArmour Plus.
      - c. National Gypsum; e2XP Interior Extreme.
      - d. USG Corporation; "Mold Tough Glass-Mat Panels."
    - 2. Core: 5/8 inch, Type X, unless otherwise indicated.
    - 3. Core: 5/8 inch, abuse resistant where indicated.
    - 4. Long Edges: Tapered.
    - 5. Mold Resistance: ASTM D 3273, score of 10.
- 2.5 TRIM ACCESSORIES
  - A. Interior Trim: ASTM C 1047.
    - 1. Material: Plastic.
    - 2. Manufacturer: Subject to compliance with the requirements, provide trim accessories from the following:
      - a. Trimtex.
      - b. Manufacturer as approved by the Architect prior to receipt of bids.

3. Shapes:
  - a. Cornerbead.
  - b. Bullnose bead.
  - c. LC-Bead: J-shaped; exposed long flange receives joint compound.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

- 1 Basis-of-Design Product: Subject to compliance with requirements, provide Fry Reglet No. DA.1, DRM 625-100; Standard Reveal Molding 5/8" deep x " tall, or comparable product by one of the following:
  - a. Fry Reglet Corporation.
  - b. Gordon Inc.
  - c. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.
4. Provide Fry "Snap-In" Reveal where indicated to cover cut edge of wall coverings and prevent peeling.

## 2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
3. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
  - a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, sandable topping compound.
5. Skim Coat. For fourth coat, use drying-type, sandable topping compound.

## 2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- D. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
    - b. Pecora Corporation; AIS-919.
    - c. USG Corporation; SHEETROCK Acoustical Sealant.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Extend panels a minimum of 1/2-inch into hollow-metal frames.
- G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  2. Fit gypsum panels around ducts, pipes, and conduits.
  3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- J. STC-Rated Assemblies and Assemblies with Insulation: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- K. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
1. Wallboard Type: Vertical surfaces unless otherwise indicated.
  2. Type X: Where required for fire-resistance-rated assembly.
  3. Ceiling Type: Ceiling surfaces.
  4. Glass-Mat Interior Type: At interior face of exterior wall construction, tile backing panels, and as indicated on Drawings.
- B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
  2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
  3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners unless otherwise indicated.
  - 2. Bullnose Bead: Use where indicated.
  - 3. LC-Bead: Use at exposed panel edges.
- D. Aluminum Trim: Install in locations indicated on Drawings.

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in other Division 09 Sections.
  - 3. Level 5:
    - a. On interior face of exterior walls.
    - b. On all fiberglass-faced gypsum interior panels where paint is final decoration, unless otherwise noted.
    - c. On all walls scheduled to receive vinyl wall covering as a finish material.

### 3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity of each type of ceiling unit installed.
  - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity of each type of grid system installed.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Ceiling products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Class A according to ASTM E 1264.
  - 2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANEL TYPE **SAT-1**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide one of the following:
  - 1. Armstrong World Industries; "Ultima" No. 1910.
  - 2. CertainTeed Corporation; "Symphony M High NRC" No. 1222-75-1
  - 3. United States Gypsum Company; "Mars" No. 86185.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.
- C. Classification: Provide panels as follows:
  - 1. Type and Form: Type IV, mineral base with membrane-faced overlay; Form 2, water felted; with vinyl overlay on face.
  - 2. Pattern: E (lightly textured).
- D. Color: White.
- E. Light Reflectance (LR): Not less than 0.88.
- F. Ceiling Attenuation Class (CAC): Not less than 35.
- G. Noise Reduction Coefficient (NRC): Not less than 0.75.
- H. Edge/Joint Detail: Square.
- I. Thickness: 3/4 inch.
- J. Modular Size: 24 by 24 inches.

- K. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

#### 2.4 METAL SUSPENSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CertainTeed Corporation.
  - 3. United States Gypsum Company.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System for SAT-1 AND SAT-2: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.
  - 1. Structural Classification: Intermediate-duty system.
  - 2. End Condition of Cross Runners: Override (stepped) or butt-edge type.
  - 3. Cap Material: Cold-rolled steel or aluminum.
  - 4. Cap Finish: Painted white.

#### 2.5 ACCESSORIES

- A. Wire Hangers, Braces, and Ties: Provide wires as follows:
  - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.135-inch- diameter wire.

#### 2.6 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
  - 1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.
  - 2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
  - 3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, provide, as work of this Section, supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. When steel framing does not permit installation of hanger wires at spacing required, provide carrying channels or other supplemental support for attachment of hanger wires.
  - 6. Do not attach hangers to steel deck tabs.
  - 7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 8. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  - 9. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
  - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
  - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
  - 1. Arrange directionally patterned acoustical panels as follows:
    - a. As indicated on reflected ceiling plans.
  - 2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
  - 3. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

### 3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

### 3.5 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
  - 1. Concrete masonry units (CMUs).
  - 2. Steel and iron.
  - 3. Wood.
  - 4. Gypsum board.
  - 5. Sealed concrete floor.
- B. Related Requirements:
  - 1. Section 055000 "Metal Fabrications" for shop priming metal fabrications.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
    - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..

b. Other Items: Architect will designate items or areas required.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

#### 1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:
  1. Behr Process Corporation.
  2. Benjamin Moore & Co.
  3. PPG Architectural Coatings.
  4. Sherwin-Williams Company (The).

#### 2.2 PAINT, GENERAL

- A. Material Compatibility:
  1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- B. Colors: As indicated in a color schedule.
- C. Bonding Primer: Where paint is scheduled to be applied to glazed CMU, tile, or other similar surfaces, provide a bonding primer:

1. Behr Process Corporation: Interior/Exterior Bonding Primer 432.
2. Benjamin Moore & Co.; Insl-X STIX
3. PPG Architectural Coatings; Gripper interior/Exterior.
4. Sherwin-Williams Company (The); Extreme Bond Interior/Exterior Primer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  1. Masonry (Clay and CMUs): 12 percent.
  2. Wood: 15 percent.
  3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
  1. Application of coating indicates acceptance of surfaces and conditions.

#### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
  2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed in occupied spaces:
    - a. Uninsulated metal piping.
    - b. Pipe hangers and supports.
    - c. Metal conduit.
    - d. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
    - e. Other items as directed by Architect.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### 3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.6 INTERIOR PAINTING SCHEDULE

#### A. Concrete Substrates, Traffic Surfaces:

1. Water-Based Clear Sealer System: Two (2) coats water-based sealer:
  - a. BEN: M27-00 Clear Acrylic Sealer
  - b. PPG: Perma-Crete Plex-Seal WB Interior/Exterior Clear Sealer 4-6200.
  - c. S-W: H & C Wet Look Sealer 50.048054.

#### B. CMU Substrates:

1. Dry Environments:
  - a. One (1) coat, latex block filler:
    - 1) BEHR: Behr Pro Block Filler Primer, 50 (<50 g/L VOC).
    - 2) Benjamin Moore: Ultra Spec® Masonry Hi-Build Block Filler 571 (<50 g/L VOC).
    - 3) PPG Paints; Speedhide Masonry Latex Block Filler, 6-7 (<50 g/L VOC).
    - 4) Sherwin-Williams: PrepRite Latex Block Filler, B25W25 (<50 g/L VOC).
  - b. Two (2) coats, acrylic-latex enamel (eggshell):
    - 1) BEHR: Behr Pro i300 Interior Eggshell, 330 (<5 g/L VOC).
    - 2) Benjamin Moore: Ultra Spec® 500 Interior Eggshell Finish N538 (0 g/L VOC).
    - 3) PPG Paints: 6-4310XI Speedhide Zero VOC Interior Latex Eggshell (0 g/L VOC).
    - 4) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex EgShel, B20W2600 (<50 g/L VOC).
2. Wet Environments:
  - a. One (1) coat, latex block filler:

- 1) Behr Paint Company; Behr Pro Block Filler Primer PR50 (<50 g/L VOC).
- 2) PPG Paints; Amerlock 400 Block Filler (<199 g/L VOC).
- 3) Sherwin-Williams Company (The); Pro Industrial Heavy Duty Block Filler, B42W150 (< 50 g/L VOC).

b. Two (2) coats, acrylic-latex enamel (eggshell):

- 1) Behr Paint Company; US Coatings AquaGrip 2600 Gloss Water-Base Epoxy Coating (97 g/L VOC).
- 2) PPG Paints; Aquapon WB EP Epoxy, 98E-1 Series (26 g/L VOC).
- 3) Sherwin-Williams Company (The); Pro Industrial WB Catalyzed Epoxy, Gloss, B73 Series (<50 g/L VOC).

C. Steel Substrates:

1. Hollow Metal Doors and Frames:

a. One (1) coat, water based primer:

- 1) BEHR: Premium Plus Multi-Surface Primer, 436 (<50 g/L VOC).
- 2) Benjamin Moore: Ultra Spec HP Acrylic Metal Primer HP04 (43 g/L VOC).
- 3) PPG Paints; Pitt-Tech Plus Waterborne Acrylic Primer/Finish 4020PF (91 g/L VOC).
- 4) Sherwin-Williams: Pro Industrial Pro-Cryl Universal Primer, B66-310 (< 100 g/L).

b. Two (2) coats, water-based epoxy finish:

- 1) BEHR: Behr Pro Pre-Catalyzed Waterborne Epoxy Semi-Gloss HP150 (<10 g/L VOC).
- 2) Benjamin Moore: V341 COROTECH WB Pre-Cat Epoxy Coating Semi-Gloss (71 g/L VOC).
- 3) PPG Paints; Aquapon WB EP Epoxy, 98E-1 Series (26 g/L VOC).
- 4) Sherwin-Williams: Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series (<50 g/L VOC).

D. Wood Substrates:

1. Doors, Frames, Trim and Chair Rails

a. Opaque Epoxy System:

1) One (1) coat, latex primer:

- a) BEHR: Premium Plus All-In-One Primer & Sealer, 75 (<5 g/L VOC).
- b) Benjamin Moore: Advance® Waterborne Alkyd Primer 0790 (<50 g/L VOC).
- c) PPG Paints; Seal Grip Gripper Universal Acrylic Primer/Sealer, 17-921XI (<50 g/L VOC).
- d) Sherwin-Williams PrepRite ProBlock Latex, B51-600 (<50 g/L VOC).

2) Two (2) coats, water-based epoxy finish:

- a) BEHR: Behr Pro Pre-Catalyzed Waterborne Epoxy Semi-Gloss HP150 (<10 g/L VOC).

- b) Benjamin Moore: V341 COROTECH WB Pre-Cat Epoxy Coating Semi-Gloss (71 g/L VOC).
- c) PPG Paints; Aquapon WB EP Epoxy, 98E-1 Series (26 g/L VOC)..
- d) Sherwin-Williams: Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series (<50 g/L VOC).

E. Gypsum Board Substrates:

1. Walls:

a. One (1) coat, latex primer:

- 1) BEHR: Premium Plus Interior Drywall Primer & Sealer, 73 (<50 g/L VOC).
- 2) Benjamin Moore: Ultra Spec® 500 Interior Latex Primer N534 (0 g/L VOC).
- 3) PPG Paints; Speedhide Zero Interior Latex Sealer 6-4900xi (<50 g/L VOC).
- 4) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex Primer, B28W2600 (< 50 g/L VOC).

b. Two (2) coats, -acrylic-latex enamel (eggshell):

- 1) BEHR: Behr Pro i300 Interior Eggshell. 330 (<5 g/L VOC).
- 2) Benjamin Moore: Ultra Spec® 500 Interior Eggshell Finish N538 (0 g/L VOC).
- 3) PPG Paints; Speedhide Zero VOC Interior Latex Eggshell 6-4310XI (0 g/L VOC).
- 4) Sherwin-Williams: ProMar 200 Zero VOC Interior Latex EgShel, B20W2600 (< 50 g/L VOC).

2. Ceilings:

a. One (1) coat, latex primer:

- 1) BEHR: Premium Plus Interior Drywall Primer & Sealer, 73 (<50 g/L VOC).
- 2) Benjamin Moore: Ultra Spec® 500 Interior Latex Primer N534 (0 g/L VOC).
- 3) PPG Paints; Performance Flat Interior Latex (<50 g/L VOC). – self priming).
- 4) Sherwin-Williams: ProMar 400 Interior Primer, B28W4600 (< 50 g/L VOC).

b. Two (2) coats, Acrylic-Latex (flat):

- 1) BEHR: Behr Pro i100 Interior Flat, 110 (<50 g/L VOC).
- 2) Benjamin Moore: Ultra Spec® 500 Interior Flat Finish N536 (0 g/L VOC).
- 3) PPG Paints; Performance Flat Interior Latex (<50 g/L VOC).
- 4) Sherwin-Williams: ProMar 400 Zero VOC Interior Latex Flat, B30-4600 (< 50 g/L).

END OF SECTION 099123