BOARD OF CONTRACT AND SUPPLY
CITY OF PROVIDENCE, RHODE ISLAND

REQUEST FOR PROPOSALS

Item Description: **PROVIDENCE CITY HALL ELEVATOR REPLACEMENT**

Procurement/MinuteTraq #:48442

Date to be opened: 3/24/2025

Issuing Department: Public Property

QUESTIONS

- Please direct questions related to the bidding process, how to fill out forms, and how to submit a bid (Pages 1-8) to the Purchasing Department.
    - Email: purchasing@providenceri.gov
        - Please use the subject line "**Solicitation Question**"
- Please direct questions relative to the Minority and Women's Business Enterprise Program and the corresponding forms (Pages 9-13) to the MBE/WBE Outreach Director for the City of Providence, Grace Diaz
    - Email: gdiaz@providenceri.gov
        - Please use subject line "**MBE WBE Forms**"
- Please direct questions relative to the specifications outlined (beginning on page 14) to the issuing department's subject matter expert:
    - Name: Dan Kittridge
    - Title: Capital Improvements Projects Manager
    - Email Address: dkittridge@providenceri.gov

Pre-bid Conference

There will be a Mandatory Pre-Bid Conference
Date of Pre-Bid Conference: 3/10/25 Time: 10:00 am
Location: Providence City Hall, 25 Dorrance St, Providence, RI

Deadline for questions submissions:
Questions are due Monday, March 17, 2025 by 5 pm.

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INSTRUCTIONS FOR SUBMISSION

Meeting Date: 3/24/2025

Bids may be submitted up to **2:15 P.M.** on the above meeting date at the **Department of the City Clerk. Room 311, City Hall. 25 Dorrance Street, Providence.** At 2:15 P.M. all bids will be publicly opened and read at the Board of Contract Meeting in Conference Room 305, on the 3rd floor of City Hall.

- Bidders must submit **2 copies** of their bid in sealed envelopes or packages labeled with the captioned **Item Description** and the **City Department to which the solicitation and bid are related and must include the company name and address on the envelope as well**. (On page 1).
- If required by the Department, please keep the original bid bond and check in only one of the envelopes.
- Communications to the Board of Contract and Supply that are not competitive sealed bids (i.e. product information/samples) should have "**NOT A BID**" written on the envelope or wrapper.
- Only use form versions and templates included in this solicitation. If you have an old version of a form do not recycle it for use in this bid.
- The bid envelope and information relative to the bid must be addressed to:

Board of Contract and Supply
Department of the City Clerk – City Hall, Room 311
25 Dorrance Street
Providence, RI 02903

****PLEASE NOTE: This bid may include details regarding information that you will need to provide (such as proof of licenses) to the issuing department before the formalization of an award.**

This information is NOT requested to be provided in your initial bid by design.

All bids submitted to the City Clerk become public record. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record. The City has made a conscious effort to avoid the posting of sensitive information on the City's Open Meetings Portal, by requesting that such sensitive information be submitted to the issuing department only at their request.

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BID PACKAGE CHECKLIST

Digital forms are available in the City of Providence Purchasing Department Office or online at **http://www.providenceri.gov/purchasing/how-to-submit-a-bid/**

The bid package **MUST** include the following, in this order:

- Bid Form 1: Bidder's Blank as the cover page/ 1st page (s*ee page **6** of this document*)
- Bid Form 2: Certification of Bidder as 2nd page (s*ee page **7** of this document*)
- Bid Form 3: Certificate Regarding Public Records (s*ee page **8** of this document)*
- Bid Form 4: Affidavit of City Vendor (*see pages **9 and 10** of this document*)
- Forms from the Minority and Women Business Enterprise Program: Based on Bidder Category. S*ee forms and instructions enclosed (pages **11-12**) or on: https://www.providenceri.gov/purchasing/minority-women-owned-business-mbewbe-procurement-program/*

***Please note: MBE/WBE forms must be completed for EVERY bid submitted and must be inclusive of ALL required signatures. Forms without all required signatures will be considered incomplete.**

- Bidder's Proposal/Packet: Formal response to the specifications outlined in this RFP, including pricing information and details related to the good(s) or service(s) being provided. Please be mindful of formatting responses as requested to ensure clarity.
- Financial Assurance, *if requested* (a*s indicated on page 5 of this document under "Bid Terms")*
- Addenda (If Any) - Must Be Acknowledged on Bid Form
- Product Information for Items Submitted as 'Or Equal' to Specified Materials
- City of Providence CDBG Program Federal Construction Contract Provisions for Contracts over $100,000 (**Attachment B**): provide filled-out forms with bid.
    - **Forms must also be provided for each and every subcontractor** providing labor on the project.

All of the above listed documents are REQUIRED. (With the exception of financial assurances, which are only required if specified on page 5.)

******Failure to meet specified deadlines, follow specific submission instructions, or enclose all required documents with all applicable signatures will result in disqualification, or in an inability to appropriately evaluate bids.***

BOARD OF CONTRACT AND SUPPLY
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NOTICE TO VENDORS

1. The Board of Contract and Supply will make the award to the lowest qualified and responsible bidder.
2. In determining the lowest responsible bidder, cash discounts based on preferable payment terms will not be considered.
3. Where prices are the same, the Board of Contract and Supply reserves the right to award to one bidder, or to split the award.
4. No proposal will be accepted if the bid is made in collusion with any other bidder.
5. Bids may be submitted on an "equal in quality" basis. The City reserves the right to decide equality. Bidders must indicate brand or the make being offered and submit detailed specifications if other than brand requested.
6. A bidder who is an out-of-state corporation shall qualify or register to transact business in this State, in accordance with the Rhode Island Business Corporation Act, RIGL Sec. 7-1.2-1401, et seq.
7. The Board of Contract and Supply reserves the right to reject any and all bids.
8. Competing bids may be viewed in person at the Department of the City Clerk, City Hall, Providence, immediately upon the conclusion of the formal Board of Contract and Supply meeting during which the bids were unsealed/opened. Bids may also be accessed electronically on the internet via the City's Open Meetings Portal.
9. As the City of Providence is exempt from the payment of Federal Excise Taxes and Rhode Island Sales Tax, prices quoted are not to include these taxes.
10. In case of error in the extension of prices quoted, the unit price will govern.
11. The contractor will **NOT** be permitted to: a) assign or underlet the contract, or b) assign either legally or equitably any monies or any claim thereto without the previous written consent of the City Purchasing Director.
12. Delivery dates must be shown in the bid. If no delivery date is specified, it will be assumed that an immediate delivery from stock will be made.
13. A certificate of insurance will normally be required of a successful vendor.
14. For many contracts involving construction, alteration and/or repair work, State law provisions concerning payment of prevailing wage rates apply (RIGL Sec. 37-13-1 et seq.)
15. No goods should be delivered, or work started without a Purchase Order.
16. **Submit 2 copies of the bid to the City Clerk, unless the specification section of this document indicates otherwise.**
17. Bidder must certify that it does not unlawfully discriminate on the basis of race, color, national origin, gender, gender identity or expression, sexual orientation and/or religion in its business and hiring practices and that all of its employees are lawfully employed under all applicable federal, state and local laws, rules and regulations. (See Bid Form 2.)

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BID TERMS

1. Financial assurances may be required in order to be a successful bidder for Commodity or Construction and Service contracts. If either of the first two checkboxes below is checked, the specified assurance **must accompany** a bid, or the bid will not be considered by the Board of Contract and Supply. The third checkbox indicates the lowest responsible bidder will be contacted and required to post a bond to be awarded the contract.

   a) ☐ A certified check for **$**_____ must be deposited with the City Clerk as a guarantee that the Contract will be signed and delivered by the bidder.

   b) ☒ A bid bond in the amount of **five** per centum (5%) of the proposed total price, must be deposited with the City Clerk as a guarantee that the contract will be signed and delivered by the bidder; and the amount of such bid bond shall be retained for the use of the City as liquidated damages in case of default. Any person signing a bid bond as an attorney-in-fact shall include with the bid bond an original, or a photocopy or facsimile of an original, power of attorney.

   c) ☒ A performance and payment bond with a satisfactory surety company will be posted by the bidder in a sum equal to one hundred per centum (100%) of the awarded contract.

   d) ☐ No financial assurance is necessary for this item.

2. Awards will be made within **ninety (90) days of bid opening**. All bid prices will be considered firm, unless qualified otherwise. Requests for price increases will not be honored.
3. Failure to deliver within the time quoted or failure to meet specifications may result in default in accordance with the general specifications. It is agreed that deliveries and/or completion are subject to strikes, lockouts, accidents, and Acts of God.

The following entry applies only for COMMODITY BID TERMS:

4. Payment for partial delivery will not be allowed except when provided for in blanket or term contracts.

The following entries apply only for CONSTRUCTION AND SERVICE BID TERMS:

5. Only one shipping charge will be applied in the event of partial deliveries for blanket or term contracts.
6. Prior to commencing performance under the contract, the successful bidder shall attest to compliance with the provisions of the Rhode Island Worker's Compensation Act, RIGL 28-29-1, et seq. If exempt from compliance, the successful bidder shall submit a sworn Affidavit by a corporate officer to that effect, which shall accompany the signed contract.
7. Prior to commencing performance under the contract, the successful bidder shall, submit a certificate of insurance, in a form and in an amount satisfactory to the City.

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BID FORM 1: Bidders Blank

1. Bids must meet the attached specifications. Any exceptions or modifications must be noted and fully explained.
2. Bidder's responses must be in ink or typewritten, and all blanks on the bid form should be completed.
3. The price or prices proposed should be stated both in **WRITING** and in **FIGURES**, and any proposal not so stated may be rejected. **Contracts exceeding twelve months must specify annual costs for each year.**
4. Bids **SHOULD BE TOTALED** so that the final cost is clearly stated (unless submitting a unit price bid), however **each item should be priced individually**. Do not group items. Awards may be made on the basis of ***total*** bid or by ***individual items***.
5. All bids **MUST BE SIGNED IN INK.**

Name of Bidder (Firm or Individual):

Contact Name:

Business Address:

Business Phone #:

Contact Email Address:

Agrees to bid on (Write the "Item Description" here):

If the bidder's company is based in a state *other than Rhode Island*, list name and contact information for a local agent for service of process that ***is located within Rhode Island***

Delivery Date (if applicable):

Name of Surety Company (if applicable):

Total Amount in Writing*:

Total Amount in Figures*:

If you are submitting a unit price bid, please insert "Unit Price Bid"

Use additional pages if necessary for additional bidding details.

Signature of Representation

Title

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BID FORM 2: Certification of Bidder
(Non-Discrimination/Hiring)

Upon behalf of_____ (Firm or Individual Bidding),

I,_____(Name of Person Making Certification),

being its_____(Title or "Self"), hereby certify that:

1. Bidder does not unlawfully discriminate on the basis of race, color, national origin, gender, sexual orientation and/or religion in its business and hiring practices.
2. All of Bidder's employees have been hired in compliance with all applicable federal, state and local laws, rules and regulations.

I affirm by signing below that I am duly authorized on behalf of Bidder, on this_____day of_____20____.

_____
Signature of Representation

_____
Printed Name

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BID FORM 3: Certificate Regarding Public Records

Upon behalf of_____ (Firm or Individual Bidding),

I,_____(Name of Person Making Certification),

being its_____(Title or "Self"), hereby certify an

understanding that:

1. All bids submitted in response to Requests for Proposals (RFP's) and Requests for Qualification (RFQ's), documents contained within, and the details outlined on those documents become public record upon receipt by the City Clerk's office and opening at the corresponding Board of Contract and Supply (BOCS) meeting.
2. The Purchasing Department and the issuing department for this RFP/RFQ have made a conscious effort to request that sensitive/personal information be submitted directly to the issuing department and only at request if verification of specific details is critical the evaluation of a vendor's bid.
3. The requested supplemental information may be crucial to evaluating bids. Failure to provide such details may result in disqualification, or an inability to appropriately evaluate bids.
4. If sensitive information that has not been requested is enclosed or if a bidder opts to enclose the defined supplemental information prior to the issuing department's request in the bidding packet submitted to the City Clerk, the City of Providence has no obligation to redact those details and bears no liability associated with the information becoming public record.
5. The City of Providence observes a public and transparent bidding process. Information required in the bidding packet may not be submitted directly to the issuing department at the discretion of the bidder in order to protect other information, such as pricing terms, from becoming public. Bidders who make such an attempt will be disqualified.

I affirm by signing below that I am duly authorized on behalf of Bidder, on

this_____day of_____20___.

_____

Signature of Representation

_____

Printed Name

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BID FORM 4: Affidavit of City Vendor

Per our Code of Ordinances Sec. 21.-28.1 (e), this form applies to a) the business, b) any political action committee whose name includes the name of the business, c) all persons holding ten (10) percent or greater equity interest or five thousand dollars ($5,000.00) or greater cash value interest in the business at any time during the reporting period, d) all executive officers of the business entity, e) any spouse or dependent child of any individual identified in a) though d) above.

Executive officers who are not residents of the state of Rhode Island are exempted from this requirement.

Per R.I.G.L. § 36-14-2, "Business" means a sole proprietorship, partnership, firm, corporation, holding company, joint stock company, receivership, trust, or any other entity recognized in law through which business for profit or not for profit is conducted.

Name of the person making this affidavit: _____

Position in the "Business" _____

Name of Entity _____

Address: _____

Phone number: _____

The number of persons or entities in your entity that are required to report under Sec. 21.-28.1 (e): _____

Read the following paragraph and answer one of the options:

Within the 12 month period preceding the date of this bid submission with the City of Providence, or with respect to the contracts that are not in writing within the 12 month period preceding the date of notification that the contract has reached the $100,000 threshold, have you made campaign contributions within a calendar year to (please list all persons or entities required under Sec. 21.-28.1 (e)).

a. Members of the Providence City Council? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

b. Candidates for election or reelection to the Providence City Council? ☐ Yes ☐ No
   - If Yes, please complete the following:
     Recipient(s) of the Contribution:
     Contribution Date(s): Contribution Amount(s):

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c. The Mayor of Providence? ☐ Yes ☐ No
- If Yes, please complete the following:
  Recipient(s) of the Contribution:
  Contribution Date(s): Contribution Amount(s):

d. Candidates for election or reelection to the office of Mayor of Providence? ☐ Yes ☐ No
- If Yes, please complete the following:
  Recipient(s) of the Contribution:
  Contribution Date(s): Contribution Amount(s):

_____
Signed under the pains and penalties of perjury.

_____
Position

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MBE/WBE Participation Plan

Please complete separate forms for each MBE/WBE subcontractor/supplier to be utilized on the solicitation.

Bidder's Name:	
Bidder's Address:	
Point of Contact:	
Telephone:	
Email:	
Procurement #:	
Project Name:	
Which one of the following describes your business' status in terms of Minority and/or Woman Owned Business Enterprise certification with the State of Rhode Island? (Check all that apply).	☐ MBE ☐ WBE ☐ Neither MBE nor WBE

This form is intended to capture commitments between the prime contractor/vendor and MBE/WBE subcontractors and suppliers, including a description of the work to be performed and the percentage of the work as submitted to the prime contractor/vendor. Please note that all MBE/WBE subcontractors/suppliers must be certified by the Office of Diversity, Equity and Opportunity at the time of bid. The MBE/WBE Directory can be found here. Please visit, the City's MBE/WBE page for details of the program (e.g. instructions and requirements).

- **Nonprofit organizations are not required to complete the rest of this form.**
- **Construction projects unable to identify subcontractors prior to bid submission (e.g. Design Build) are required to provide updates to the MBE/WBE Outreach Office**

Name of Subcontractor/Supplier:					
Type of RI Certification:	☐ MBE ☐ WBE ☐ Neither				
Address:					
Point of Contact:					
Telephone:					
Email:					
Detailed Description of Work to Be Performed by Subcontractor or Materials to be Supplied by Supplier Per the Scope of Work provided in the RFP					
Total Contract Value ($):		Subcontract Value ($):		Participation Rate (%):	
Anticipated Date of Performance:					

I certify under penalty of perjury that the forgoing statements are true and correct.

Prime Contractor/Vendor Signature	**Title**	**Date**
Subcontractor/Supplier Signature	**Title**	**Date**

***If you did not meet the 20% MBE/WBE combined participation goal, submit a Waiver Request Form.**

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MBE/WBE Waiver Request Form

Fill out this form only if you did not meet the 20% MBE/WBE participation goal.
State-certified MBE or WBE Prime Bidders are NOT REQUIRED to fill out this form.

Submit this form to the City of Providence MBE/WBE Outreach Director, Grace Diaz, at gdiaz@providenceri.gov, for review **prior to bid submission.** This waiver applies only to the current bid which you are submitting to the City of Providence and does not apply to other bids your company may submit in the future. **In case a waiver is needed, City Department Directors should not** recommend a bidder for an award if this form is not included, absent or is not signed by the city of Providence MBE/WBE director**.**

Prime Bidder: _____ Contact Email and Phone_____
Company Name, Address: _____ Trade _____
Project /Item Description (as seen on RFP):

_____

_____

To receive a waiver, you must list the certified MBE and/or WBE companies you contacted, the name of the primary individual with whom you interacted, and the reason the MBE/WBE company could not participate on this project.

MBE/WBE Company Name	Individual's Name	Company Name	Why did you choose not to work with this company?

I acknowledge the City of Providence's goal of a combined MBE/WBE participation is 20% of the total bid value. I am requesting a waiver of _____ % MBE/WBE (20% minus the value of **Box F** on the Subcontractor Disclosure Form). If an opportunity is identified to subcontract any task associated with the fulfillment of this contract, a good faith effort will be made to select MBE/WBE certified businesses as partners.

_____	_____	_____
Signature of Prime Contractor / or Duly Authorized Representative	Printed Name	Date Signed
_____	_____	_____
Signature of City of Providence MBE/WBE Outreach Director / or Duly Authorized Representative	Printed Name of City of Providence MBE/WBE Outreach Director	Date Signed

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BID PACKAGE SPECIFICATIONS

Background Information

The City of Providence is seeking quotes from responsible vendors for replacement of the elevator in shaft 2 at Providence City Hall. The City replaced the first elevator last year and is now seeking to replace the remaining aging elevator with a new one. The City has engaged Signal Works Architecture to work with Otis Elevators to select a new elevator model and design the changes to the elevator shaft and other areas to accommodate it. Signal Works have developed the set of construction documents which form the basis of this design.

Scope of Work

Vendors are requested to provide quotes for replacement of the remaining old elevator in shaft 2 at Providence City Hall. The elevators in City Hall have recently reached the end of their useful life and the City has been in the process of working to replace them. The first elevator was replaced with the new car entering service in January 2024, and the City has worked with Signal Works Architecture to select a new elevator for shaft 2 and develop the plans needed to install it. The City seeks to replace the current elevator with an updated model from Otis Elevators based on their Gen3^{TM} machine room-less elevator system, which is documented in the attached drawings and project manual.

This work will include the following items, as laid out in the attached drawing package and specifications including, but not limited to: Demolition of the existing elevator in shaft 2 and all of its associated machinery in the shaft and the machine room in the basement, Modification of the elevator shaft, shaft openings, and basement machine room as necessary to install the new elevator, Installation of the selected new elevator car and associated machinery and electrical equipment, Replacement of all finishes around the elevator openings following installation of the new car, and Integration of the new elevator with the existing one in shaft 1. The total scope of work and requirements for work performed are documented in the attached drawing package and specifications. There are two items identified as alternates, outside the baseline scope. See the following Alternates section for details.

City Hall will remain active during the period of construction, the winning bidder will coordinate this work with the owner to minimize the impact to the occupants of the building. The chosen contractor shall be responsible for securing all necessary construction permits.

The contractor will be responsible for timely removal of all construction debris and demolished materials from the site. Hazardous materials testing has identified that much of the paint used both inside and around the elevator shaft contains lead. A lead testing report has been included in the bid documents, and the winning bidder will need to follow proper lead remediation procedures during construction in these areas. Additionally, the old elevator machinery to be demolished may contain oils and PCBs, as noted in the attached hazardous materials report, which should be taken into account when removing and disposing of this old equipment. No asbestos was identified in any of the areas where work will be performed.

A pre-bid conference will be held on March 10, 2025 (two weeks after advertisement) at 10 am on site for prospective bidders to inspect the area and ask questions of the design team and the City's representative.

ATTACHMENTS

As a part of the request for proposal package, attached to this document are A) the project drawing package, B) the project specifications, and C) a draft of the project contract.

ALTERNATES

There are two items in the drawing package identified as alternates: the possibility of the need for an additional relief vent for the new elevator if the existing vent installed for the elevator in shaft 1 is insufficient for the new elevator, and an option to procure replicas of the existing ornamental floor indicators.

ADD ALTERNATE #1 Elevator vent – All work associated with providing an elevator vent, inclusive of necessary demolition of the skylight and new work for roofing and flashing, in the event the existing vent cannot be used. See drawing package.	**$**
ADD ALTERNATE #2 Brass/Bronze Elevator Indicator – Provide replicas of the existing brass/bronze replica indicators currently on the Shaft 2 elevator openings for installation at the Shaft 1 elevator openings. See drawing package.	**$**

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PROVISIONS OF THIS PROJECT

- Upon the Issuance of the Award from the Board of Contract – the City shall issue a Contract to be executed by the City and the vendor incorporating the bid specifications. All Provisions of the Specifications are binding.
- Any Permits Required by the City of Providence and/or State of Rhode Island Shall be Obtained by the Vendor – Permit Fees by the City of Providence Shall be Waived – the State ADA Fee Must be Paid
- This project qualifies for prevailing wages per the Davis Bacon Act (HUD). Federal certified payrolls will need to be submitted to the owner for all hours worked on site for this project. The Wage Decision for this project shall be as recorded on the Bid Date and is available at https://sam.gov/content/wage-determinations. Weekly Certified payrolls must be Submitted with Pay Requests Including Monthly Utilization Form
- An Insurance Certificate Shall be Submitted to the City Within 10 Days of Award
- A Copy of the Vendors Contractor's License Must be Submitted within 10 Days of Award
- All On-Site Personnel Shall be Licensed (If Required) and Shall have Proof of All Licenses Required by the State of Rhode Island to Perform the Work Required
- Pay Requests Must be Submitted on Approved AIA Billing Documents (City will Provide if Needed)
- All Subcontractors Shall be Listed on the Bid Form – All Insurance & Payroll Requirements Apply
    - General Contractor Shall be the Insurance Certificate Holder and the City Shall be Named as 'Additionally Insured' with Respect to Liability Insurance
- A Submittal Log Must be Submitted within 10 Days of Award

CLOSE OUT DOCUMENTS

- Prior to Final Payment the Vendor Shall Provide the Following:
    - Copies of Permits Signed off and Approved (If Any)
    - Operating Manuals and Warranties Shall Be Transferred and/or Delivered
    - Full and Completed As-Built Drawings Shall be Submitted for Approval
    - Training Shall be Provided to City Personnel (If Required)
    - Certification by Manufacturers Representative (If Required)

QUALIFICATIONS

Qualifications will be evaluated on the basis of similar project experience for:

a. Completion of similar projects within the last 5 years.
b. Size and dollar value of similar completed projects.
c. Contractor's performance with similar projects. (references will be checked)
d. Relevant experience of individuals assigned to the project.

Questions regarding this bid package shall be submitted via e-mail to **The Providence Purchasing Department** at purchasing@providenceri.gov and **Dan Kittridge, Capital Improvement Project Manager** at dkittridge@providenceri.gov , no later than 12:00pm on Monday, Mach 17, 2025.

Dan Kittridge is the project contact and can be reached at 401-473-8418

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SUPPLEMENTAL INFORMATION

If the issuing department for this RFP determines that your firm's bid is best suited to accommodate their need, you will be asked to provide proof of the following prior to formalizing an award.

An inability to provide the outlined items at the request of the department may lead to the disqualification of your bid.

This information is <u>NOT</u> requested to be provided in your initial bid that you will submit to the City Clerk's office by the "date to be opened" noted on page 1. This list only serves as a list of items that your firm should be ready to provide on request.

<u>All bids submitted to the City Clerk become public record</u>. Failure to follow instructions could result in information considered private being posted to the city's Open Meetings Portal and made available as a public record.

You must be able to provide:

- Business Tax ID will be requested after an award is approved by the Board of Contract and Supply.
- Proof of Insurance.
- Certificate of Good Standing with the Rhode Island Secretary of State.
- Contractor Licenses

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CITY OF PROVIDENCE STANDARD TERMS & CONDITIONS

1. The terms "you" and "your" contained herein refer to the person or entity that is a party to the agreement with the City of Providence ("the City") and to such person's or entity's employees, officers, and agents.
2. The Request For Proposals ("RFP") and these Standard Terms and Conditions together constitute the entire agreement of the parties ("the Agreement") with regard to any and all matters. By your submission of a bid proposal or response to the City's RFP, you accept these Standard Terms & Conditions and agree that they supersede any conflicting provisions provided by bid or in any terms and conditions contained or linked within a bid and/or response. Changes in the terms and conditions of the Agreement, or the scope of work thereunder, may only be made by a writing signed by the parties.
3. You are an independent contractor and in no way does this Agreement render you an employee or agent of the City or entitle you to fringe benefits, workers' compensation, pension obligations, retirement or any other employment benefits. The City shall not deduct federal or state income taxes, social security or Medicare withholdings, or any other taxes required to be deducted by an employer, and this is your responsibility to yourself and your employees and agents.
4. You shall not assign your rights and obligations under this Agreement without the prior written consent of the City. Any assignment without prior written consent of the City shall be voidable at the election of the City. The City retains the right to refuse any and all assignments in the City's sole and absolute discretion.
5. Invoices submitted to the City shall be payable sixty (60) days from the time of receipt by the City. Invoices shall include support documentation necessary to evidence completion of the work being invoiced. The City may request any other reasonable documentation in support of an invoice.

   The time for payment shall not commence, and invoices shall not be processed for payment, until you provide reasonably sufficient support documentation. In no circumstances shall the City be obligated to pay or shall you be entitled to receive interest on any overdue invoice or payment. In no circumstances shall the City be obligated to pay any costs associated with your collection of an outstanding invoice.
6. For contracts involving construction, alteration, and/or repair work, the provisions of applicable state labor law concerning payment of prevailing wage rates (R.I. Gen. Laws §§ 37-13-1 et seq., as amended) and the City's First Source Ordinance (Providence Code of Ordinances §§ 21-91 et seq., as amended) apply.
7. With regard to any issues, claims, or controversies that may arise under this Agreement, the City shall not be required to submit to dispute resolution or mandatory/binding arbitration. Nothing prevents the parties from mutually agreeing to settle any disputes using mediation or non-binding arbitration.
8. To the fullest extent permitted by law, you shall indemnify, defend, and hold harmless the City, its employees, officers, agents, and assigns from and against any and all claims, damages, losses, allegations, demands, actions, causes of action, suits, obligations, fines, penalties, judgments, liabilities, costs and expenses, including but not limited to attorneys' fees, of any nature whatsoever arising out of, in connection with, or resulting from the performance of the work provided in the Agreement.
9. You shall maintain throughout the term of this Agreement the insurance coverage that is required by the RFP or, if none is required in the RFP, insurance coverage that is considered in your industry to be commercially reasonable, and you agree to name the City as an additional insured on your general liability policy and on any umbrella policy you carry.
10. The City shall not subject itself to any contractual limitations on liability. The City shall have the time permitted within the applicable statute of limitations, and no less, to bring or assert any and all causes of action, suits, claims or demands the City may have arising out of, in connection with, or resulting from the performance of the work provided in the Agreement, and in no event does the City agree to limit your liability to the price of the Agreement or any other monetary limit.

11. The City may terminate this Agreement upon five (5) days' written notice to you if you fail to observe any of the terms and conditions of this Agreement, or if the City believes your ability to perform the terms and conditions of this Agreement has been materially impaired in any way, including but in no way limited to loss of insurance coverage, lapsing of a surety bond, if required, declaration of bankruptcy, or appointment of a receiver. In the event of termination by the City, you shall be entitled to just and equitable compensation for any satisfactory work completed and expenses incurred up to the date of termination.
12. Written notice hereunder shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the entity for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known by the party providing notice.
13. In no event shall the Agreement automatically renew or be extended without a writing signed by the parties.
14. You agree that products produced or resulting from the performance of the Agreement are the sole property of the City and may not be used by you without the express written permission of the City.
15. For any Agreement involving the sharing or exchange of data involving potentially confidential and/or personal information, you shall comply with any and all state and/or federal laws or regulations applicable to confidential and/or personal information you receive from the City, including but not limited to the Rhode Island Identity Theft Protection Act, R.I. Gen. Laws § 11-49.3-1, during the term of the Agreement. You shall implement and maintain appropriate physical, technical, and administrative security measures for the protection of, and to prevent access to, use, or disclosure of, confidential and/or personal information. In the event of a breach of such information, you shall notify the City of such breach immediately, but in no event later than twenty-four (24) hours after discovery of such breach.
16. The Agreement is governed by the laws of the State of Rhode Island. You expressly submit yourself to and agree that any and all actions arising out of, in connection with, or resulting from the performance of the Agreement or relationship between the parties shall occur solely in the venue and jurisdiction of the State of Rhode Island or the federal court located in Rhode Island.
17. The failure of the City to require performance of any provision shall not affect the City's right to require performance at any time thereafter, nor shall a waiver of any breach or default of this Agreement constitute a waiver of any subsequent breach or default or a waiver of the provision itself.
18. If any term or provision of this Agreement, or the application thereof to any person or circumstance shall, in any extent, be invalid or unenforceable, the remainder of this Agreement shall not be affected thereby, and each term and provision shall be valid and enforceable to the fullest extent permitted by law.

Project Drawings

Project Specifications

Draft Project Contract

Signal Works Architecture

PROJECT MANUAL

City of Providence – Capital Improvement Projects
City Hall Shaft 2 Elevator Replacement

BID DOCUMENTS
January 17, 2025

Signal Works Project
#2418

11 Aleppo Street, Providence, RI 02909 • 401.400.ARCH
bryan@signalworksarchitecture.com • http://www.signalworksarchitecture.com

SECTION 00 0110

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END OF SECTION

SECTION 00 6700
PREVAILING WAGE RATES

Prevailing Wage is the cost per hour, for labor wages set by law, involving construction work for various and related trades. It involves a bidding process for contractors that will use federal, state or municipal monies (tax payer dollars) for work on projects that will be used for the public, by the public.

The successful contractor and sub-contractor shall comply with the provisions of Rhode Island General Laws (RIGL) Chapter 37 pertaining to the "Prevailing Wage Laws" for all municipal funded projects in excess of one thousand ($1,000) dollars. The RI Department of Labor has accepted the prevailing wage rates as determined by the Federal Wage and Hour Division under the Davis-Bacon Act. A copy of the most current wage decision pertaining to this bid is available from the Director of Labor at 457-1860 or on the web site: www.dlt.ri.gov/pw.

As required under RIGL 37-13-13, the successful contractor must certify and submit weekly payroll forms to the Finance Director's Office.

END OF DOCUMENT

DOCUMENT 00 7200
GENERAL CONDITIONS

1. General Conditions: AIA A201, General Conditions of the Contract for Construction.

2. ~~General Conditions: AIA A271, General Conditions of the Contract for Furniture~~, ~~Furnishings and Equipment.~~

3. General Conditions Forms: General Conditions are available from the American Institute of Architects, Washington, D.C., 202-626-7300. General Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

DOCUMENT 00 73 00
SUPPLEMENTARY CONDITIONS

1. Supplementary Conditions: Supplementary Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

SECTION 00 7400

MINORITY BUSINESS ENTERPRISE REQUIREMENTS AND WOMEN BUSINESS ENTERPRISE REQUIREMENT

The bidder will endeavor to obtain a minimum of ten (15%) of the awarded amount to minority business subcontractors and/or suppliers certified by the **State of Rhode Island**.

PART 1 This offer of minority participation will be considered a factor in the contract award

PART 2 The successful bidder shall substantiate this participation within ten (10) days after receipt of Notice of Award. The bidder will endeavor to obtain a minimum of fifteen (15%) of the awarded amount to women business subcontractors and/or suppliers certified by the **State of Rhode Island**.

Under Rhode Island General Laws §37-14.1, Minority business enterprises shall be included in all procurements and construction projects under this chapter and shall be awarded a minimum of fifteen percent (15%) of the dollar value of the entire procurement or project. Of that fifteen percent (15%), minority business enterprises owned and controlled by a minority owner, shall be awarded a minimum of seven and one-half percent (7.5%), and minority business enterprises owned and controlled by a woman shall be awarded a minimum of seven and one-half percent (7.5%).

PART 3

- This offer of minority participation will be considered a factor in the contract award and RIDE Reimbursement

- The successful bidder shall substantiate this participation within ten (10) days after receipt of Notice of Award.

END OF DOCUMENT

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.1 SUMMARY

A. **Project Identification:** City Hall Elevator Replacement

B. **Project Summary:** Remove the Existing Elevator and Associated Equipment and provide construction work suitable for the procurement and installation of a new elevator in Shaft 2.

C. Particular Project Requirements:

1. Requirements for sequencing, scheduling and completion date to be coordinated with Owner and Architect prior to Procurement & Mobilization
2. Building to be Occupied & Operational during Construction, Contractor to provide all safety-related barriers/enclosures to ensure occupant safety.
3. No Substitutions will be allowed for the Elevator Manufacturer.
4. Contractor's use of new and existing facilities: To be Coordinated w/ Owner.
5. HazMat Abatement is included in the project scope. Refer to Appendix “A” of this project manual for additional information.
6. It is not the intent that construction mobilization / on-site supervision will be needed during elevator lead-time.
7. It is assumed that there will be two mobilization efforts:
    a. Mobilization #01: Demolition & Preparatory Work for New Install
    b. Mobilization #02: Installation & Finish Work

D. **Permits and Fees:** Apply for, obtain, and pay for permits, fees, and utility company back-charges required to perform the work. Submit copies to Architect.

E. **Codes:** Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.

F. **Dimensions:** Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.

G. **Existing Conditions:** Notify Architect of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.

H. Coordination:

1. Coordinate the work of all trades.
2. Prepare coordination drawings for areas above ceilings where close tolerances are required between building elements and mechanical and electrical work.
3. Verify location of utilities and existing conditions.

I. Installation Requirements, General:

1. Inspect substrates and report unsatisfactory conditions in writing.
2. Do not proceed until unsatisfactory conditions have been corrected.
3. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
4. Install materials in exact accordance with manufacturer's instructions and approved submittals.
5. Install materials in proper relation with adjacent construction and with proper appearance.

6. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the Owner.
7. Refer to additional installation requirements and tolerances specified under individual specification sections.

J. **Limit of Use:** Limit use of work as indicated. Keep driveways and entrances clear.

K. **Existing Construction:** Maintain existing building in a weathertight condition. Repair damage caused by construction operations. Protect building and its occupants.

L. Definitions:
1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
3. Match Existing: Match existing as acceptable to the Owner.

M. **Intent:** Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth, but which is reasonable implied or necessary for proper performance of the project shall be included.

N. **Writing Style:** Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, 'Provide tile' means 'Contractor shall provide tile.'

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION - Not Applicable to This Section

END OF SECTION

SECTION 01 1100

VOLATILE ORGANICE COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, AND PAINTS

1.0 GENERAL

1.1 Summary

A. The specification section includes requirements for volatile organic compound (VOC) content in adhesives, sealants, paints and coatings used for this project.

1.2 General Requirements

A. The Contractor is required to implement practices and procedures to meet the project's environmental goals, which include achieving NE-CHPS criteria. Specific project goals which may impact this area of work are listed in the applicable paragraphs of this specification section. The Contractor shall ensure that the requirements related to these goals, as defined in the sections below and in the related sections of the Contract Documents, are implemented to the fullest extent feasible.

1.3 References

A. Rule 1168 – "Adhesive and Sealant Applications," amended January 7, 2005: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

B. Rule 1113 – "Architectural Coatings," amended July 9, 2004: South Coast Air Quality Management District (SCAQMD), State of California, www.aqmd.gov

C. Green Seal Standard GS-11 – "Paints," of Green Seal, Inc., Washington, DC, www.greenseal.org

D. Green Seal Standard GC-03 – "Anti-Corrosive Paints," of Green Seal, Inc., Washington, DC, www.greenseal.org

1.4 VOC Requirements for Interior Adhesives

A. The volatile organic compound (VOC) content of adhesives, adhesive bonding primers or adhesive primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications."

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1.5 General

A. Unless otherwise specified below, the VOC content of all adhesive, adhesive bonding primers and adhesive primers are to be in excess of 250 grams per liter.

B. For specified building construction related applications, allowable VOC content is as follows:

1. Architectural Applications

a.	Indoor carpet adhesive	50
b.	Carpet pad adhesive	50
c.	Wood floor adhesive	100
d.	Rubber floor adhesive	60
e.	Subfloor adhesive	50
f.	Ceramic tile adhesive	65
g.	VCT and asphalt tile adhesive	50
h.	Drywall and panel adhesive	50
i.	Cove base adhesive	50
j.	Multipurpose construction adhesive	70
k.	Structural glazing adhesive	100

1.6 VOC Requirements for Interior Sealants

A. The VOC content of sealants, or sealant primers used in this project shall not exceed the limits defined in Rule 1168 – "Adhesive and Sealant Applications."

B. The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

1. Sealants

a.	Architectural	250
b.	Other	420

2. Sealant Primer

a.	Architectural – Nonporous	250
b.	Architectural – Porous	775
c.	Other	750

1.7 VOC Requirements for Interior Paints

A. Paints and Primers: Paints and primers used in non-specialized interior applications (i.e., for wallboard, plaster, wood, metal doors and frames, etc.) shall meet the VOC limitations of the Green Seal Paint Standard GS-11, of Green Seal, Inc., Washington, DC. Product-specific environmental requirements are as follows:

1. Volatile Organic Compounds

a. The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by the U.S. Environmental Protection Agency (EPA) Reference Test Method 24.

1) Interior Paints and Primers (non-flat) – 150 g/l
2) Interior Paints and Primers (flat) – 50 g/l

B. Anti-Corrosive and Anti-Rust Paints

1. Anti-corrosive and anti-rust paints applied to interior ferrous metal substances shall meet the VOC limitations of the Green Seal Paint Standard GS-03 requirements as follows:

a. Volatile Organic Compounds

1) The VOC concentrations (in grams per liter) of the product shall not exceed those listed by the EPA Reference Test Method 24: Anti-Corrosive and Anti-Rust Paints – 250 g/l.

1.8 VOC Requirements for Interior Coatings

A. Clear wood finishes, floor coatings, stains, sealers and shellacs applied to the interior shall meet the VOC limitations defined in Rule 113. The VOC limits defined by SCAQMD, based on 07/09/04 amendments, are as follows. VOC limits are defined in grams per liter, less water and less exempt compounds.

1.	Clear wood finishes - Varnish	350
2.	Clear wood finishes – Sanding Sealers	350
3.	Clear wood finishes – Lacquer	550
4.	Shellac – Clear	730
5.	Shellac – Pigmented	550
6.	Stains	250
7.	Floor Coatings	100
8.	Waterproofing Sealants	250
9.	Sanding Sealers	275
10.	Other Sealers	200

2.0 PRODUCTS

Not Applicable

3.0 EXECUTION

Not Applicable

END OF DOCUMENT

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Price and Payment Procedures:
   1. Alternates
   2. Allowances

1.2 ALTERNATES

A. Total Price: Provide total price for each alternate in Bid Form. Include cost of modifications to other work to accommodate alternate. Include related costs such as overhead and profit.

B. Acceptance of Alternates: Owner will determine which alternates are selected for inclusion in the Contract.

C. Coordination of Alternates: Modify or adjust affected adjacent work as necessary to integrate work of the alternate into Project. Coordinate alternates with related work to ensure that work affected by each selected alternate is properly accomplished.

D. List of Alternates:
   1. Deduct-Alternate #01: Refer to alternate layout as shown on the drawings.

1.3 ALLOWANCES

A. Allowances: Lump sum allowances and unit cost allowances are listed below and as indicated on the Drawings. Amounts shall include all costs including overhead and profit except as specifically noted. Coordinate allowances with requirements for related and adjacent work.

B. Notification of Owner: Notify Owner of date when final decision on allowance items is required to avoid delays in the work.

C. Certification of Quantities: Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing, waste, and similar margins.

D. Lump Sum Allowances: Include the following amounts in the base bid for materials, installation, overhead, profit and all costs for the following items.
   1. Not Applicable – Refer to Spec Section 01 2200 – Unit Prices

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION - Not Applicable to This Section

END OF SECTION

SECTION 01 2200

UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured and verified by the Architect.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1: Brass/Bronze Elevator Indicator Replica

Unit Price No. 1: $_____ per Unit

END OF SECTION

SECTION 01 2300
ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS - Not Applicable to This Section

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1 – Elevator Vent

1. Should it be found that the existing vent located in the shaft cannot be used, the add-alternate is for all work associated with providing an elevator vent, inclusive of necessary demolition of the skylight and new work for roofing and flashing. Refer to Drawings for additional information.

B. Alternate No. 2 – Brass/Bronze Elevator Indicator Replicas @ Shaft 1 Elevator

1. Provide additional brass/bronze replica indicators at the Shaft 1 Elevator locations at all landings. Refer to Drawings for additional information.

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
   1. Supervisory personnel.
   2. Preconstruction conference.
   3. Project meetings, minimum of two per month; prepare and distribute minutes.

B. Work Schedule: Submit progress schedule, updated monthly.

C. Submittal Schedule: Prepare submittal schedule; coordinate with progress schedule.

D. Schedule of Tests: Submit schedule of required tests including payment and responsibility.

E. Perform Surveys: Lay out the work and verifying locations during construction.

F. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.

G. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 SUBMITTALS

A. Types of Submittals: Provide types of submittals listed in individual sections and number of copies required below. All submittals are to be submitted digitally via email
   1. Shop drawings, reviewed and annotated by the Contractor – pdf format.
   2. Product data – pdf format.
   3. Samples - as required to indicate range of color, finish, and texture to be expected.
   4. Inspection and test reports – pdf format.
   5. Warranties – Sample Warranty with Product Data, Executed Warranty with Closeout Documents.
   6. Survey Data – As applicable
   7. Closeout submittals – Physical Thumb drive, 2 copies.

B. Submittal Procedures: Comply with project format for submittals. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.
   1. Submittals to be titled per the 32-Divisions of CSI,
      a. Example: 08 4313-001-00 – Aluminum Storefront PD
      b. Example: 08 4313-002-00 – Aluminum Storefront Shop Drawings

C. Samples and Shop Drawings: Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

D. Requests for Information (RFIs): RFIs are to be submitted with detailed descriptions of the issue(s) and include potential solutions from the contractor for remedying the issue for the Architect’s evaluation and response. RFIs not containing detailed information may be rejected in part or in whole until the responsible contractor provides the necessary

information. The responsible contractor will not dictate the method of response from the Architect, it is at the Architect and/or Design Team's discretion as to the formality of their response. RFIs are to begin at "001"

E. Warranties: Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. The contractor, supplier, or installer responsible for performance of warranty shall sign warranties.

F. Review Periods: Architect and engineers have **10-business days to review submittals**, and **5-business days to review and respond to Requests for Information (RFIs)**. It is the contractor's responsibility to manage the schedule of construction to avoid critical-path issues.

1.3 LEED REQUIREMENTS AND SCORECARD

A. Not Applicable

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION - Not Applicable to This Section

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Provide types of submittals listed in individual sections and number of copies required below.

1. Shop drawings, reviewed and annotated by the Contractor – pdf format.
2. Product data – pdf format.
3. Samples - as required to indicate range of color, finish, and texture to be expected.
4. Inspection and test reports - 2 copies.
5. Warranties - 2 copies.
6. Survey data - 2 copies.
7. Closeout submittals - 2 copies.

B. Comply with project format for submittals.

C. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.

D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

E. Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Warranties shall be signed by contractor, supplier, or installer responsible for performance of warranty.

F. Architect and engineers have 10-business days to review submittals, and 5-business days to review and respond to Requests for Information (RFIs).

PART 2 - **PRODUCTS** - Not Applicable to This Section

PART 3 - **EXECUTION** - Not Applicable to This Section

END OF SECTION

SECTION 01 3516

ALTERATIONS PROJECT PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Summary: The procedures and administrative requirements of this Section apply to all of the following Sections of the Specification which are involved in alterations to the existing building.

B. Extent Notes: Cut into or partially remove portions of the existing building as necessary to make way for new construction. Include such work as:

1. Cutting, moving or removal of items shown to be cut, moved, or removed.

2. Cutting, moving or removal of items not shown to be cut, moved, or removed, but which must be cut, moved, or removed to allow the new work to proceed. Work or items which are to remain in the finished work shall be patched or reinstalled after their cutting, moving, or removal, and their joints and finishes made to match adjacent or similar work.

3. Removal of existing surface finishes as needed to install new work and finishes.

4. Removal of abandoned items and removal of items serving no useful purpose, such as abandoned piping.

5. Repair or removal of dangerous or unsanitary conditions resulting from alterations work.

C. Patch, match, repair, refinish or reinstall existing items to remain in finished work, to specified condition for each material, with joints and finishes made to match adjacent or similar work.

D. Relocate and reinstall designated existing salvaged materials.

1.02 SCHEDULING AND ACCESS

A. Work Scheduling / Sequence:

1. Any work to be performed during hours other than normal business hours (8:00 A.M. to 5:00 P.M. Monday through Friday unless noted otherwise) must have prior approval of the Project Owner / Manager.

B. Maintenance of Access and Operations:

1. During period of construction, the Owner will continue to perform normal activities in existing building. Maintain proper and safe access to the Owner-occupied areas at all times.

2. Schedule demolition and remodeling operations with Owner in such a manner as to allow Owner operations to continue with minimum interruption.

3. During period of construction, do not obstruct in any manner existing exit ways of Owner-occupied areas. Prior to removal of existing exit ways (stairs, corridors, doors) as part of new Work, provide and maintain new exit ways so as to maintain same number of exit ways. Maintain existing fire doors in an operable condition.

C. Maintenance of Existing Services:

1. Maintain environmental control in existing building, especially temperature,

humidity and dust control.

2. Provide temporary lines and connections as required to maintain existing mechanical and electrical services in building.

3. Notify the Property Owner / Manager a minimum of three (3) days prior to each required interruption of mechanical or electrical services in building. Such interruptions shall be only at such times and for lengths of time as approved by the Property Manager. In no event shall interruption occur without prior approval of the Property Manager.

D. Building Access:

1. Contractor shall access building at time designated by Property Owner / Manager.

2. Access to construction areas within building shall be as designated by the Property Manager.

3. Restrict construction traffic to areas specifically designated by Property Manager.

1.03 ALTERATIONS, CUTTING AND PROTECTION:

A. Do not start any cutting or alterations work until dust protection is in place.

B. Extent:

1. Cutting and removal work shall be performed so as not to cut or remove more than is necessary and so as not to damage adjacent work.

2. Conduct work in such a manner as to minimize noise and to minimize accumulation and spread of dirt and dust.

3. Perform cutting for ductwork and other rectangular openings with carborundum saw with approved dust arrestor.

4. Drill holes for conduit and piping using core drills.

C. Shoring, Bracing and Capping: Provide shores, needling and bracing as needed to keep building structurally secure and free of deflection in all its parts, and as needed for installation of new structural members. In telephone equipment areas, all shoring shall be wood or other approved nonconductive material, and shall not be secured to, braced from, or supported by telephone equipment or cable racks.

D. Responsibility and Assignment to Trades:

1. Contractor shall assign the work of moving, removal, cutting, patching and repair to trades under his supervision so as to cause the least damage to each type of work encountered, and so as to return the building as much as possible to the appearance of new work.

2. Patching of finish materials shall be assigned to mechanics skilled in the work of the finish trade involved.

E. Protection:

1. Protect remaining finishes, equipment, and adjacent work from damage caused by cutting, moving, removal and patching operations. Protect surfaces which will remain a part of the finished work.

2. Protect existing facilities and features, within designated construction limits and along corridor access route to construction area.

3. Cover existing wall and floor finishes in work areas, in adjacent areas and along corridor access route to prevent damage from product delivery and construction operations. Use same UL listed sheeting material as specified for temporary partitions below.

4. Material to be stored on floor must be placed on 1/4 in. tempered hardboard (Masonite) sheeting or other approved substrate. Do not lean material against walls or equipment.

5. During demolition, cutting and construction, provide positive dust control by wetting dust debris and by completely sealing openings to Owner occupied areas with temporary partitions, so as to prevent spread of dust and dirt to adjacent areas.

6. After materials, equipment and machinery are installed, properly protect Work until final acceptance.

7. Any damage resulting from construction operations shall be repaired by the Contractor without cost to the Owner.

8. All access points to the building shall remain secure. Doors remaining open for a period of time for material delivery or removal shall be protected against unauthorized entry.

F. Salvage:

1. Salvage sufficient quantities of cut or removed material to replace damaged work or patch new work where required. Protect and provide dry, secure storage for items to be reused.

2. Salvage items specifically indicated for salvage and reuse, including:

a. Existing doors and frames.

b. Existing access flooring system.

3. Do not incorporate salvaged or used material in new construction, except where small quantities of finish material which are difficult to match or duplicate are approved for patching or extending purposes by Architect or except as specifically indicated.

4. Salvaged items left over after completion of Work shall be disposed of by Contractor, unless scheduled to be turned over to Owner.

G. Temporary Barricades/Partitions: Provide and maintain temporary and dust partitions to seal openings to Owner-occupied areas. Provide partitions as required to maintain dust control. Partition locations may or may not be indicated on the Drawings.

1. Type 1 Partitions: (Maintained in place for 30 days or less) Framing: Commercial softwood species, fire-retardant treated in accordance with AWPA C20, and bearing UL Label FR-S. Provide continuous 2 x 4 top and bottom plates, 2 x 4 studs at 24 in. o.c., and continuous 2 x 4 bridging 4 ft. studs may be used. At Contractor's option, drywall metal studs may be used. Provide 3-5/8 in. wide metal studs at 24 in. o.c., with continuous head and floor channels.

   Covering: Central Offices - Griffolyn type 55 FR or Durashield 8000FR reinforced sheeting, listed by Underwriters' Laboratories, Inc., as having a flame spread rating of less than 25 and smoke developed rating of less than 50. Apply double thickness of sheeting, fastened to one side with no-tear fasteners. Tape joints continuously.

   Note: In situations where Type 1 Partitioning will be installed within 2 ft. of existing or proposed telecommunications equipment, the sheeting shall be Griffolyn type 55 ASFR or Durashield 8000ASFR, anti-static, fire retardant sheeting.

2. Type II Partitions: (Maintained in place 18 months or less)

   Framing: (same as Type I above)

   Covering: 1/4 in. thick tempered hardboard or 1/2 in. thick plywood, listed by Underwriters' Laboratories, Inc., as having a flame spread rating of less than 25 and smoke developed rating of less than 50. Apply to one side and fasten to studs with drywall screws at 12 in. o.c., countersunk. Fire-retardant paint or fireproof coating is not required.

3. Type III Partitions: (Maintained in place longer than 18 months)

   Type: One hour fire rated gypsum drywall partition.

   Framing: 3-5/8 in. wide metal drywall studs. Provide continuous head and floor runners. Space studs at 24 in. o.c.

   Covering: One layer of 5/8 in. thick Type "X" gypsum board each side, fastened to studs and runners with drywall screws at 12 in. o.c. Tape and bed panel joints.

4. Doors: Type I and II Partitions: Single acting doors, opening out, with sturdy closer, closing against gasketed stops on frame to reduce passage of dust. Cover one side of each door with same material as used to cover partitions. Provide ample wood push bars and bump plates.

Type III Partitions: Fire-resistive door and frame assembly bearing UL "C" Labels, complete, including metal frame, door and hardware.

5. Sealing: Seal perimeter of partitions and doors to prevent passage of dust. At Type I and II partitions, tape fastener depressions, joints between panels and joints between panels and floors, ceilings and columns with 2 in. wide pressure sensitive tape.

6. Mats: Provide mats at doors to reduce tracking of dust. Replace or clean daily.

H. Debris:

1. Remove debris promptly from the site each day.

2. Do not let piled material endanger structure.

3. During cutting and coring operations, use metal lined wood box secured tight against surface, to catch falling debris and water.

1.04 PATCHING, EXTENDING AND MATCHING:

A. Skill:

1. Patch and extend existing work using skilled mechanics who are capable of matching the existing quality of workmanship. The quality of patched or extended work shall not be less than that specified in the Sections of the product and execution Specifications which follow these General Requirements.

B. Patching:

1. In areas where any portion of an existing finished surface is damaged, lifted, stained, or otherwise made or found to be imperfect, patch or replace the imperfect portion of the surface with matching material.

2. Provide adequate support or substrate for patching of finishes.

3. If the imperfect surface was a painted or coated one, repaint or recoat the patched portion in such a way that uniform color and texture over the entire surface results.

4. If the surrounding surface cannot be matched, repaint or recoat the entire surface.

C. Quality:

1. In the Sections of the product and execution of Specifications which follow these General Requirements, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the Work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.

2. The quality of the products that exist in the building, as apparent during pre-quotation site visits, shall serve as the Specification requirement of strength, appearance, and other characteristics.

D. Transitions:

1. Where new work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched work shall match existing adjacent work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of no closer than three (3) feet.

2. Where masonry or other finished surface is cut in such a way that a smooth transition with new work is not possible, terminate the existing surface in a neat fashion along a straight line at a natural line of division and provide trim appropriate to the finished surface.

3. Where two or more spaces are indicated to become one space, rework floors and ceilings so that horizontal planes, without breaks, steps or bulkheads result.

4. In cases of extreme change of level (3 in. or more), obtain instructions from Project Manager as to method of making transition. Either stepping, bulkheading, encasement, ramping, sloping or change of transition line shall be employed, or a combination of these, as directed in each case by the Project Manager.

E. Matching:

1. Restore existing work that is damaged during construction to a condition equal to its condition at the time of the start of the Work.

2. At locations in existing areas where partitions are removed, patch the floors, walls and ceilings with finish materials to match adjacent finishes.

F. Overall Requirement that the Work Be Complete:

1. Where a product or type of construction occurs in the existing building, and it is not specified as a part of the new work, provide such products or types of construction as needed to patch, extend or match the existing work.

2. These Specifications will generally not describe existing products or standards of execution, nor will they enumerate products which are not a part of the new construction. The existing product is its own specification.

3. The presence of any product or type of construction in the old work shall cause its patching, extending, or matching to be performed, as necessary to make the work complete and consistent, to identical standards of quality.

1.05 REPAIR:

A. Replace work damaged in the course of alterations, except at areas approved by the Project Manager for repair.

B. Where full removal of extensive amounts of almost-suitable work would be needed to replace damaged portions, then filling, spackling, straightening, and similar repair techniques, followed by full painting of other finishing, will be permitted.

C. If the repaired work is not brought up to the standard for new work, the Project Manager will direct that it be cut out and replaced with new work.

1.06 FIRESTOPPING:

A. Where existing fire-rated partitions, walls or floors are penetrated by new work, each trade providing such new work shall seal around penetrating conduit, pipe, duct or sleeve in accordance with manufacturer's printed instructions and specifications.

B. Refer to Section 07840 – Firestopping (if applicable)

1.07 CLEANING:

A. Each Successive Trade:

1. As each trade finishes its work on each part of the alterations work and related new work, it shall clean up its work areas and make work surfaces ready for the work of the succeeding trades.

2. Spillage, overspray, collections of dust or debris, and damage to Owner-occupied spaces shall be cleaned or remedied immediately by the responsible trade.

B. Each Area as it is Completed:

1. As soon as work in each area of the alterations is complete, clean up all surfaces, remove equipment, salvage and debris, and return in condition suitable for use by the Owner as quickly as possible.

PART 2 – PRODUCTS – Not Applicable to this Section

PART 3 – EXECUTION – Not Applicable to this Section

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Quality Monitoring: Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Perform quality control procedures and inspections during installation.

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

C. Tolerances: Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate. Comply with manufacturers' tolerances.

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

E. Manufacturer's Field Services: When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to perform the following as applicable, and to initiate instructions when necessary.
1. Observe site conditions.
2. Conditions of surfaces and installation.
3. Quality of workmanship.
4. Start-up of equipment.
5. Test, adjust and balance of equipment.

F. Mock-Ups: Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes. Accepted mock-ups shall be a comparison standard for the remaining Work.

G. Removal of Mock-Ups: Where mock-up has been accepted by Architect and no longer needed, remove mock-up and clear area when directed to do so.

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION - Not Applicable to This Section

END OF SECTION

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Examine the Contract Documents and become thoroughly acquainted with the detailed material and workmanship requirements.

C. Comply with requirements of the Building Code of the State of Rhode Island for quality, workmanship and requirements for all materials.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality-control and testing services.

B. Quality-control services include inspections, tests, reports and related actions performed by Contractor, independent agencies, governing authorities, engineers hired by the Owner and engineers employed by the Contractor.

C. Inspection and testing services are mandated by the laws and Building Code of the State of Rhode Island and are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with regulatory or Contract Document requirements.

D. Statement of Special Inspections and Contractor’s Statement of Responsibility follow this Section.

1.3 RESPONSIBILITIES

A. Special Inspection: The Owner shall select a Special Inspection Firm and pay for all Special Inspection Services, except as noted herein. The Contractor shall provide, be responsible for, and pay for the services for testing for
   1. As Determined in Specification Sections Herein.

B. The Contractor shall provide a Site Safety Program or Plan during all phases of construction.

C. Inspection and Testing Responsibilities other than those mandated by the State of Rhode Island as Special Inspections: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.

   1. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform quality-control services. Costs for these services are included in the Contract Sum.
   2. Where individual Sections specifically indicate that certain inspections, tests, and other quality-control services are the Owner's responsibility, the Owner will employ and pay a qualified independent testing agency to perform those services.
      a. Where the Owner has engaged a testing agency for testing and inspecting part of the

Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless agreed to in writing by the Owner.

3. The costs of the following tests and inspections shall be accounted for separately and reported to the Owner.
   a. Tests and inspection of materials and workmanship not conforming to contract requirements.
   b. Tests and inspection necessitated by any other noncompliance with contract requirements.
   c. Acceptance tests for materials because of changes in properties or changed sources.
   d. Costs of inspector's time and expenses wasted because of cancellations or delays of the work.
   e. Tests and services of inspectors required by a public authority.
   f. Energy performance inspections and test required to demonstrate compliance with Enterprise Green Communities certification Mandatory Building Performance Standard criteria.

B. Retesting: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

1. The cost of retesting construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction indicated noncompliance with Contract Document requirements.
2. No part of the time lost to retesting shall be made the subject of a claim for extension of time or for excess cost or damages by the Contractor

C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:

1. Provide access to the Work.
2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
4. Provide facilities for storage and curing of test samples.
5. Deliver samples to testing laboratories.
6. Provide the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
7. Provide security and protection of samples and test equipment at the Project Site.

D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties.

1. The Testing Laboratory shall make all necessary arrangements with the General Contractor to ensure the presence of the required inspectors at all contract operations specified to be included under the Testing and Inspection Agreement. The General Contractor shall notify the Testing Laboratory a reasonable time in advance (not less than 24 hours) of the time when operations requiring inspection or testing are scheduled to start.
2. Provide necessary personnel, equipment and facilities for tests and inspection. Personnel shall be experienced and competent in their particular specialties.
3. The Testing Laboratory shall conduct its work so as not to cause a delay in the progress of construction. Any non-compliance with the Contract Documents shall be immediately

reported to the General Contractor and the Architect.

4. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the Work during the performance of its services.
5. Nothing herein specified permits the Testing Laboratory to allow the General Contractor to deviate from the requirements of the Contract Documents.
6. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
7. The agency shall not perform any duties of the Contractor.

E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.
2. A complete set of Drawings and Specifications for the project work will be made available by the Owner at the project site. The Testing Laboratory personnel shall become thoroughly familiar with all provisions of these documents which apply for the testing and inspection services.

1.4 SUBMITTALS

A. Qualifications: Submit qualifications of testing laboratories proposed for use for approval.

B. Schedule: Submit a schedule of required tests and inspections for review.

C. Reports: Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.

1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
   a. Date of issue, Project Title, and Project Number
   b. Name, address, and telephone number of testing agency.
   d. Dates and locations of samples and tests or inspections.
   e. Names of individuals making the inspection or test.
   f. Designation of the Work and test method.
   g. Identification of product and Specification Section.
   h. Complete inspection or test data.
   i. Test results and an interpretation of test results.
   j. Ambient conditions at the time of sample taking and testing.
   k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
   l. Name and signature of laboratory inspector.
   m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

1.6 REFERENCE

A. American Society for Testing and Materials: ASTM E. 329-77: Inspection and Testing Agencies for Concrete Steel and Bituminous Materials as used in Construction.

B. Wherever the source or characteristics of materials change, or the quality of materials provided indicates lack of compliance with contract requirements, full or partial acceptance tests shall be performed as directed by the Structural Engineer of Record through the Architect.

PART 2 - PRODUCTS – Not Applicable to this Section

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:
1. Date of test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to applicable Engineer and 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 Engineer's, Architect's and Construction Manager's (if applicable) 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 Documents requirements for Division 01 Section "Cutting and Patching".

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are the Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Temporary Services: Provide temporary services and utilities, including payment of utility costs including the following, as applicable to the project.
   1. Water (potable and non-potable).
   2. Lighting and power.
   3. Metering.
   4. Telephone.
   5. Toilet facilities.
   6. Materials storage.

B. Construction Facilities: Provide construction facilities, including payment of utility costs including the following, as applicable to the project.
   1. Construction equipment.
   2. Dewatering and pumping.
   3. Enclosures.
   4. Heating.
   5. Lighting.
   6. Elevator.
   7. Access.
   8. Roads.

C. Security and Protection: Provide security and protection requirements including the following, as applicable to the project.
   1. Fire extinguishers.
   2. Site enclosure fence, barricades, warning signs, and lights.
   3. Building enclosure and lock-up.
   4. Temporary jobsite protection.
   5. Environmental protection.
   6. Pest control during and at the end of construction.
   7. Snow and ice removal if applicable.

D. Personnel Support: Provide personnel support facilities including the following, as applicable to the project.
   1. Architect's field office with telephone, fax and data connection.
   2. Contractor's field office.
   3. Sanitary facilities.
   4. Drinking water.
   5. Project identification sign.
   6. Cleaning.

PART 2 PRODUCTS - Not Applicable to this Section

PART 3 EXECUTION – Not Applicable to this Section

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Manufacturers: Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as acceptable to manufacturers of primary materials.

B. Product Selection: Provide products selected or “equal” approved by Architect. Products submitted for substitution shall be submitted with complete documentation and include construction costs of substitution including related work. It is the responsibility of the contractor to “prove” the product substitution can be considered “an equal”

C. Substitutions: Request for substitution must be in writing. Conditions for substitution include:
   1. An 'or equal' phrase in the specifications.
   2. Specified material cannot be coordinated with other work.
   3. Specified material is acceptable to authorities having jurisdiction.
   4. Substantial advantage is offered to the Owner in terms of cost, time, or other valuable consideration.

D. Substitution Requests: Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Approval of shop drawings, product data, or samples containing substitutions is not an approval of a substitution unless an item is clearly presented as a substitution at the time of submittal.

PART 2 PRODUCTS - Not Applicable to this Section

PART 3 EXECUTION - Not Applicable to this Section

END OF SECTION

SECTION 01 6350

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 "Alternates" for products selected under an alternate.
3. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
4. 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 an advantage to Contractor or Owner (IE. Schedule Improvements and/or Cost Savings).

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. 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 **CSI Form 13.1A** (included following this section)
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 ALL qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Qualities may include, but are not limited to attributes such as performance, weight, size, durability, visual effect, aesthetic characteristics, 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, from ICC.
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 fourteen days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within **15** days of receipt of request, or 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 the 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 **60 days after the Notice of Award**. Requests received after that time may be considered or rejected at the sole 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 Applicable to this Section

END OF SECTION

SECTION 01 7000
EXECUTION & CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Substantial Completion: The following are prerequisites to substantial completion. Provide the following.
   1. Punch list prepared by Contractor and subcontractors as applicable.
   2. Supporting documentation.
   3. Warranties.
   4. Certifications.
   5. Occupancy permit.
   6. Start-up and testing of building systems.
   7. Change over of locks.
   8. Meter readings.
   9. Commissioning documentation.

B. Final Acceptance: Provide the following prerequisites to final acceptance.
   1. Final payment request with supporting affidavits.
   2. Completed punch list.

C. As-Built Drawings: Provide a marked-up set of drawings including changes, which occurred during construction.

D. Project Closeout: Provide the following during project closeout.
   1. Submission of record documents.
   2. Submission of maintenance manuals.
   3. Training and turnover to Owner's personnel.
   4. Final cleaning and touch-up.
   5. Removal of temporary facilities.

PART 2 PRODUCTS - Not Applicable to This Section

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

A. Cutting and Patching: Provide cutting and patching work to properly complete the work of the project, complying with project requirements for:
   1. Structural work.
   2. Mechanical/electrical systems.
   3. Visual requirements, including detailing and tolerances.
   4. Operational and safety limitations.
   5. Fire resistance ratings.
   6. Inspection, preparation, and performance.
   7. Cleaning.

B. Means and Methods: Do not cut and patch in a manner that would result in a failure of the work to perform as intended, decrease energy performance, increase maintenance, decrease operational life, or decrease safety performance.

C. Inspection: Inspect conditions prior to work to identify scope and type of work required. Protect adjacent work. Notify Owner of work requiring interruption to building services or Owner's operations.

D. Performance of Operations: Perform work with workmen skilled in the trades involved. Prepare sample area of each type of work for approval.

E. Cutting: Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Inspect for concealed utilities and structure before cutting.

F. Patching: Make patches, seams, and joints durable and inconspicuous. Comply with tolerances for new work.

G. Cleaning: Clean work area and areas affected by cutting and patching operations.

END OF SECTION

SECTION 01 7310
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes procedural requirements for cutting and patching.

B. Related Sections include the following:

1. Division 01 Section "Selective Demolition" for demolition of selected portions of the building for alterations.
2. Divisions 02 through 32 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
    a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 23 and 26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

A. Cutting: Removal of existing 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 QUALITY ASSURANCE

A. Structural Elements: Do not cut structural elements without the prior consent of the Architect

B. Operational Elements: Do not cut and patch the following 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.

1. Primary operational systems and equipment.
2. Air or smoke barriers.
3. Fire-protection systems.
4. Control systems.
5. Communication systems.
6. Conveying systems.
7. Electrical wiring systems.
8. Operating systems of special construction in Division 13 Sections.

C. 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.

1.5 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 of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing 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 existing 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 existing 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, if necessary.

B. Protection: Protect existing 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 Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid or minimize interruption of services to occupied areas. Coordinate cutting or patching that might require interruptions in services with Architect and Owner.

3.3 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 existing 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 existing 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. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete, [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 2 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 the 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 of these Specifications.

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.
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 existing 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 existing 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.

END OF SECTION

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 Commissioning is a quality-oriented process for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meet defined objectives and criteria. The Commissioning process begins at project inception (during the pre-design phase) and continues through the life of the facility. The commissioning process includes specific tasks to be conducted during each phase in order to verify that design, construction, and training meet the Owner's Project Requirements.

PART 2 The Goals of the Commissioning Process are to:

2.1 Verify that applicable equipment and systems are installed according to the contract documents, manufacturer's recommendations, and industry accepted minimum standards, and that they receive adequate operational checkout by installing contractors.

2.2 Verify and document proper performance of equipment and systems.

2.3 Verify that O&M documentation left on site is complete.

2.4 Verify that the owner's operating personnel are adequately trained.

2.5 Comply with the requirements for Commissioning services by the Rhode Island Department of Education (RIDE) and the Northeast Collaborative for High Performance Schools (NE-CHPS)

PART 3 The commissioning process does not take away from or reduce the responsibility of the system designers or installing contractors to provide a finished and fully functioning product.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions, Division 1, and other trade specific specification sections shall apply to this section.

B. Owner's Project Requirements and Basis of Design documents are included by reference for information only.

C. ASHRAE Guideline 0-2005, The Commissioning Process

1.3 SUMMARY

A. This section includes general requirements that apply to the implementation of the commissioning process without regard to specific systems, assemblies, and components.

B. Related sections include the following:1. Section 01 33 00 Submittal Procedures 2. Section 01 78 23 Operation and Maintenance Data 3. Section 01 79 00 Demonstration and Training 4. Section 22 08 00 Commissioning of Plumbing

Systems 5. Section 23 08 00 Commissioning of HVAC Systems 6. Section 26 08 00 Commissioning of Electrical Systems 7. Division 22 Plumbing 8. Division 23 Heating Ventilating and Air Conditioning 9. Division 26 Electrical 10. Division 28 Electronic Safety and Security

1.4 DEFINITIONS

A. Acceptance - A formal action, taken by a person with appropriate provider (which may or may not be contractually defined) to declare that some aspect of the project meets defined requirements, thus permitting subsequent activities to proceed.

B. Approval - Acceptance that a piece of equipment or system has been properly installed and is functioning in the tested modes according to the contract documents.

C. Basis of Design - A document that records the concepts, calculations, decisions, and product selections used to meet the Owner’s Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

D. Checklists, Construction Checklists, Installation Checklists, or Pre-Functional Checklists - Checklists that are developed by the CxA and completed by the Construction Team during all phases of the construction process to verify that materials, equipment, assemblies, and systems are installed in accordance with the Contract Documents.

E. Commissioning Authority or Agent (CxA) - The entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process.

F. Commissioning Plan (CxP) - A document developed by the CxA that outlines the organization, schedule, roles and responsibilities, and documentation requirements of the Commissioning Process. The CxP is initially developed in the design phase and updated throughout the construction and closeout process.

G. Commissioning Process - A quality-focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements.

H. Commissioning Team - The individuals who through coordinated actions are responsible for implementing the commissioning process.

I. Data logging -The monitoring and recording of flows, currents, status, pressures, etc., of equipment using stand-alone data recorders separate from the control system or the trending capabilities of control systems.

J. Deferred Performance Tests (DPTs) - Performance tests that are performed, at the discretion of the CxA, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design, or other site conditions that disallow the test from being performed.

K. Deficiency, Non-Compliance, Non-Conformance - A condition in the installation or function of a component, piece of equipment, or system that is not in compliance with the contract documents.

L. Factory Testing - Testing of equipment on-site or at the factory, by factory personnel, with or without an owner's representative present.

M. Issues Log - A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the commissioning team during the course of the commissioning process.

N. Owner's Project Requirements - A written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. This is also referred to as the Project Intent or Design Intent.

Pre-Functional Testing – testing performed by the contractors to verify complete system operation and system readiness.

Quality Based Sampling - A process for evaluating a sub-set (sample) of the total population. The sample is based upon a known or estimated probability distribution of expected values; an assumed statistical distribution based upon data from a similar product, assembly, or system; or a random sampling that has scientific statistical basis.

Seasonal Performance Tests - Performance tests that are deferred until the system(s) will experience conditions closer to their design conditions based on weather conditions.

Startup - The initial starting or activating of dynamic equipment, including completing construction checklists.

Systems Manual - A system-focused composite document that includes the operation manual, maintenance manual, and additional information of use to the owner during the occupancy and operations phase.

Functional Performance Test (FPT) - A protocol written by the CxA that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems. Performance testing includes the dynamic functions and operations of equipment and systems using manual or monitoring methods under various levels of operation. Systems are tested under various modes, such as during low cooling loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The systems are run through all the control system's sequences of operation and components are verified to respond as the sequences state.

Training Plan or Instruction Program - A written document that details the expectations, schedule, and deliverables related to the training of project operating and maintenance personnel, users, and occupants.

Verification - The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Owner's Project Requirements.

Trending – The monitoring, by a building management system or other electronic data gathering equipment, and analyzing of the data gathered over a period of time.

1.5 COORDINATION

A. Coordination of the Cx process is the responsibility of all Cx Team members.

B. The CxA coordinates the commissioning activities through the construction manager or general contractor. All members shall work together to fulfill their contracted responsibilities and meet the objectives of the contract documents.

C. The CxA, through the Owner or CM, will provide sufficient notice to the contractor for scheduling commissioning activities with respect to the Owner's participation. The CM will integrate all commissioning activities into the overall project schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.

1.6 REMOBILIZATION AND RETESTING FEES

A. In general, CxA testing will include one test of each system or equipment. The cost of any additional testing will be submitted to the Owner for review and direction. Following Owner review, the cost for additional testing to verify that performance is in accordance with the design intent may be deducted from the Contractor's final payment by the Owner.

B. In the event that a CxA site visit is scheduled in advance with the Contractor and testing is unable to be performed through no fault of the Owner and the CxA is not notified within 48 hours, the cost of the travel and time will be deducted from the contractor's final payment by the Owner.

1.7 COMMISSIONING PLAN

A. Commissioning during construction begins with an initial commissioning meeting conducted by the CxA where the commissioning process is reviewed with the project commissioning team members. This meeting shall be scheduled by the CM. Generally, the initial Cx Meeting will be scheduled within 60 days of the award of contracts related to commissioned systems and equipment.

B. Additional meetings will be required throughout construction, scheduled by the CxA, through the owner or CM, with necessary parties attending to plan, scope, coordinate, schedule future activities, and resolve problems. In general these meetings will be monthly with the frequency increasing towards substantial completion to accommodate start-ups, balancing, scheduling testing, and training.

C. The CxA reviews submittals for commissioned equipment and systems parallel with the Design Team for compliance with the OPR.

D. The construction checklists, developed by the CxA, are to be completed by the contractor (or its subcontractors), before and during the startup process and verified by the CxA.

E. The CxA witnesses selected assembly mock-ups, equipment, and system start-ups.

F. The CxA develops equipment and system functional performance test (FPT) procedures. The FPT's are executed by the contractor and witnessed and documented by the CxA.

G. The CxA reviews the O&M documentation for completeness.

H. The CxA coordinates the training plan provided by the contractor.

I. Deferred performance testing will be conducted as required.

1.8 COMMISSIONING TEAM

A. Members appointed by Contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of each contractor, including project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.

B. Members appointed by Owner:

1. CxA - An entity identified by the owner who leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.

2. Representatives of the facility Users and Operation and Maintenance personnel.

3. Architect and engineering design professionals.

1.9 RESPONSIBILITIES

Understanding and defining the roles of each participant are vital to the success of the Commissioning Process. This provides an outline of the responsibilities of each participant in the Commissioning Process. These responsibilities are typically formalized in the contracts between the Owner and the various parties and this section is not intended to supersede or negate any contracted relationships.

A. Owner (or Designated Representative)

1. Include the design professionals' Commissioning related responsibilities and scope of work in the design request for proposal and contract.

2. Oversee the development of the Owner's Project Requirements and approve any changes.

3. Designate a representative, ideally from the building's operations and maintenance team, to participate in the Commissioning Process including: a. Design Phase coordination meetings b. Construction Phase coordination meetings c. Informal owner-training as equipment is installed and started d. Maintenance orientation and inspections e. System testing and verification meetings f. Functional procedure review meetings before testing of systems g. Training sessions h. Verification demonstrations i. Systems and assemblies tests j. Final review at acceptance meeting

4. Review and approve any changes made to the Owner's Project Requirements.

5. Review, comment on, and accept the Commissioning Authority's progress and final reports.

B. Commissioning Authority (CxA)

C. The Commissioning Authority is responsible to verify that the Owner's Project Requirements for the project are satisfactorily achieved. The CxA leads, plans, schedules, and coordinates the commissioning team to implement the commissioning process. Specific tasks performed by the CxA include: Design Phase 1. Assemble a commissioning team, hold a scoping meeting and identify responsibilities. 2. Attend commissioning meetings as needed with project coordinator and design team. 3. Review the Owner's Project Requirements for clarity and completeness. 4. Develop and update the design phase commissioning plan. 5. Perform focused review of the design, drawings and specifications at various stages of development (during design development and contract document phases) as required. 6. Review the development and maintenance of the Basis of Design documentation by design team members. 7. Develop a draft construction phase commissioning plan using an Owner-approved outline. 8. Develop full commissioning specifications for all commissioned equipment. Coordinate with and integrate into the specifications of the architect and engineers. The specifications will be consistent in content, rigor and format to the referenced standards. a. A detailed description of the responsibilities of all parties. b. Details of the commissioning process. c. Reporting and documentation requirements, including formats; alerts to coordination issues, deficiency resolution; construction checklist and start up requirement.

10.

Coordinate control integration meetings where the owner, electrical engineers, mechanical engineers and CxA discuss integration issues between equipment, systems and disciplines to ensure that integration issues and responsibilities are clearly described in the specifications.

Review documents and responses from A/E to ensure that all previous comments have been addressed by the appropriate party.

The functional testing process. Specific functional test requirements, including testing conditions and acceptance criteria for each piece of equipment being commissioned.

Bid Phase 1. Answer commissioning related questions throughout the bid process.

Construction Phase

1. Perform the tasks and functions to be incorporated in the specifications ascribed to the CxA.

2. Coordinate and direct the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties.

3. Coordinate the commissioning work, with the Construction Manager, Contractor, Architect and Owner's representatives to ensure that commissioning activities are being scheduled into the master schedule.

4. Revise the construction phase commissioning plan developed during the design phase as required to include refined scope and schedule.

5. Plan and conduct commissioning meetings and distribute minutes.

6. Request and review information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures. Before startup, gather and review current control sequence and interlocks. Work with the architect so that the CxA/A/E comments are combined into one review submitted to the contractor.

7. Review coordination drawings to ensure that trades are making a reasonable effort to coordinate work. Coordinate submittal review with the architect so that the CxA/A/E comments are combined into one review submitted to the contractor.

8. Write and distribute construction checklists for commissioned equipment.

9. Develop an enhanced start-up and initial systems checkout plan with contractors for selected equipment.

10. Perform site visits to observe component and system installations. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.

11. Witness initial HVAC piping pressure test and flushing efforts to be confident that proper procedures were followed in accordance with specifications.

12. Witness select ductwork testing and cleaning sufficient to be confident that proper procedures were followed in accordance with specifications. Include documentation in the Commissioning Record.

13. Provide construction checklists for equipment/systems within the scope of work to the contractors.

14. Document construction checklist completion by reviewing completed checklists and by site observation.

15. Document system startup by reviewing start-up reports and by selected site observations.

16. Approve air and water systems balancing by spot testing and by reviewing completed reports and by selected site observation. Coordinate submittal review with the architect so that the CxA/A/E comments are combined into one review submitted to the contractor.

17. With assistance and review from the installing contractor, CxA will write functional performance test procedures for equipment and systems.

Analyze functional performance trend logs and monitoring data to verify performance. Coordinate, witness and document manual functional performance tests performed by installing contractors. Maintain a master issues log and report all issues as they occur directly to the Owner's representative and the architect.

Review equipment warranties to ensure that the Owner's responsibilities are clearly defined. Oversee and approve the training of the Owner's operating personnel. Review and approve the preparation of the O&M manuals for commissioned equipment. Coordinate submittal review with the architect so that the CxA/A/E comments are combined into one review submitted to the contractor.

Compile a final commissioning Report, which shall include:

a. A brief summary report that includes a list of participants and roles, brief building description, overview of commissioning and testing scope, and a general description of testing and verification methods. For each piece of commissioned equipment, the report should contain the disposition of the CxA regarding the adequacy of the equipment, documentation and training meeting the contract documents in the following areas: 1) Equipment meeting the equipment specifications 2) Equipment installation 3) Functional performance and efficiency 4) Equipment documentation 5) Operator training

b. All outstanding non-compliance items shall be specifically listed. Recommendations for improvement to equipment or operations, future actions, commissioning process changes, etc. shall also be listed. Each non- compliance issue shall be referenced to the specific functional test, inspection, trend log, etc. where the deficiency is documented.

c. Also included in the Commissioning Record shall be the issues log, commissioning plan, progress reports, submittal and O&M manual reviews, training record, test schedules, construction checklists, start-up reports, functional tests, and trend log analysis.

Comply with the requirements of any applicable green-building rating systems (i.e. LEED, High Performance Buildings, Green Guide for Healthcare, etc.).

Period Coordinate and supervise required opposite season or deferred testing as needed. Return to the site at 10 months warranty period and review with facility staff the current building operation and the condition of outstanding issues related to the original and seasonal commissioning. Also interview facility staff and identify problems or concerns they have with operating the building as originally intended. Make suggestions for improvements and for recording these changes in the O&M manuals. Identify areas that may come under warranty or under the original construction contract. Assist facility staff in developing reports and documents and requests for services to remedy outstanding problems. The CxA is not responsible for correcting deficiencies.

D. Design Team

The primary role of the Design Team is to translate the Owner's Project Requirements into a complete design. Relative to commissioning, the design team's responsibilities vary depending on the specific project and contract, but may include:

1. Participate in the development and documentation of the initial Owner's Project Requirements.

2. Document revisions to the Owner's Project Requirements as approved by the Owner.
3. Document the Basis of Design.
4. Integrate the Commissioning Process requirements provided by CxA in the Contract Documents.
5. Respond to Commissioning Team design review comments.
6. Adequately detail the Operations and Maintenance of the systems and assemblies in Contract Documents.
7. Review and incorporate the CxA's comments from submittal reviews.
8. Participate in the initial Operation and Maintenance personnel training sessions. Include a presentation of the project's Basis of Design and descriptions of the associated systems.
9. Review functional test procedures.
10. Review the CxA's reports and logs and comment as appropriate.
11. Review and comment on the final Cx Report.

Construction Manager

The Construction Manager provides management, technical, and administrative expertise during the Construction phase to ensure the building Owner's goals relating to schedule and quality are met. The Construction Manager's responsibilities related to the Commissioning Process typically include:

1. Include any costs for Commissioning Process activities in the contract price. 2. Include Commissioning Process requirements and activities in all contractors'

contracts. 3. Include Cx-related milestones in the construction schedule. 4. Ensure necessary accessibility to all equipment to allow for proper operation and

maintenance of the building. 5. Provide individuals with the required background and authority to implement the

Commissioning Process activities as outlined in the Contract Documents. 6. Issue a statement at the end of the project certifying that all work has been completed

in accordance with the Contract Documents and the facility is operational. 7. Respond to Commissioning Process reports and correct deficiencies identified during

installation verification or functional testing. 8. Review and comment on the final Cx Report.

Contractors

Many different contractors will be involved in the Commissioning Process. The various contractors may include the building contractors (general, mechanical and electrical), the testing, adjusting, and balancing

contractor, the building automation system contractor and others as required by the contract documents. As a member of the Commissioning Team, the responsibilities of the various building contractors include:

1. Include any costs for Commissioning Process activities in the contract price. 2. Include Commissioning Process requirements and activities in all subcontracts or

equipment purchases. 3. Ensure the cooperation and participation of all subcontractors and manufacturers of

equipment or systems to be commissioned. 4. Attend Commissioning Team meetings. 5. Include Cx-related milestones in the construction schedule. 6. Implement the training program as described in the Contract Documents. Coordinate

related activities with the CxA. 7. Provide submittals to the Owner, Design Team, and CxA as detailed in the Contract

Documents. 8. Respond to and resolve issues identified in the Cx Issues Log. 9. Notify the CxA when systems and assemblies are ready for installation verification

and testing. For repetitive assemblies, notify the CxA upon the completion of the prototype for a First Piece or Mock-Up review.

10. Complete system and equipment checklists developed by the CxA. Complete the Checklists as the work is completed. Provide completed copies to the CxA at regular intervals for verification.

11. Complete Pre-Functional test procedures. Functional testing will not take place until all Pre-Functional Tests have been fully executed.

12. Functional testing. Once pre-functional tests are complete, functional test verification will be scheduled and demonstrated in the presence of the CxA.

13. Maintain the Project Record Documents in accordance with the requirements of the Contract Documents.

Manufacturers

The suppliers of major equipment are required to support the Commissioning Team in the following manner:

1. Provide all information required for the proper Start-up and Operation and Maintenance of the system or assembly in the initial submittal, as detailed in the Contract Documents.

2. A qualified technician fluent in the programming and system operation (not a salesman) shall attend and participate in controls integration meetings to discuss how equipment with unitary or packaged controls will be integrated into the facility's central Building Management Control System (BMCS). All aspects of equipment controls will be discussed and defined to ensure compliance with the overall design intent. At a minimum the following will be discussed: communication protocols, integration with the BMCS, monitoring points, controllability, sequence of operations, alarming, etc...

3. Provide the requirements to maintain the warranty in the initial submittal, as detailed in the Contract Documents.

4. Coordinate and provide results of all factory tests required in the Contract Documents.

5. Participate in the training process as detailed in the Contract Documents.

6. Demonstrate operation and performance of equipment and assemblies as detailed in the Contract Documents.

7. A qualified technician will be on site as needed to support testing and balancing, controls integration with the BMCS, and functional testing of their equipment.

Operations and Maintenance Staff

The Operations and Maintenance staff will participate in the Commissioning Process in the following areas: 1. Define Operations and Maintenance related requirements of the building. 2. Participate in design review for O&M impacts.

3. Review maintenance manual, record drawing and documentation requirements developed by the Design Team.

4. Define training program requirements. 5. Participate/witness functional performance testing. 6. Attend contractor and vendor training sessions.

1.10 EQUIPMENT/SYSTEMS TO BE COMMISSIONED A. The following equipment/systems will be commissioned in this project:

HVAC Systems: Heating, ventilation, air conditioning and refrigeration systems and associated controls Plumbing: Domestic hot water system

Electrical: Lighting and daylighting controls Building Automation and Controls: Interface of these systems with HVAC systems

PART 2 PRODUCTS 2.1 TEST EQUIPMENT

A. All standard testing equipment required to perform startup and initial checkout and required performance testing shall be provided by the contractor for the equipment being tested. This includes, but is not limited to, two-way radios, meters, and data recorders. Data recorders may be provided by the CxA at the option of the CxA.

B. Special equipment, tools, and instruments required for testing equipment according to these contract documents shall be included in the contractor’s base bid price and shall be turned over to the owner at Project close-out.

C. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance within the tolerances specified in the specifications. If not otherwise noted, the following minimum requirements apply: Temperature sensors and digital thermometers shall have a certified calibration to NIST traceable standards within the past year to an accuracy of 0.5 degree F and a resolution of + or - 0.1 degree F. Pressure sensors shall have an accuracy of + or - 2.0% of the value

range being measured (not full range of meter) and have been calibrated within the last year. All equipment shall be calibrated according to the manufacturer's recommended intervals and when dropped or damaged. Calibration tags shall be affixed or certificates readily available.

PART 3 EXECUTION

. 3.1 OVERVIEW Through the Construction Phase of the project, it is the responsibility of the CxA to coordinate and direct the Commissioning Process activities in a logical, sequential, and efficient manner using protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties.

. 3.2 CONDUCT PRE-CONSTRUCTION MEETING The Pre-Construction Meeting is an opportunity for the CxA to meet with the Construction Team and discuss the general Commissioning Process. It is the ideal time to identify Commissioning Team members, discuss the integration of the Commissioning Process Schedule with the Construction Schedule, review the submittal review requirements, review the inspection and testing process, and develop the formal lines of communication between all parties.

. 3.3 CONDUCT REGULAR COMMISSIONING MEETINGS Once the Commissioning Team (Cx Team) has been formed, regular Commissioning Meetings are held. These meetings vary in frequency based upon the activity level at the time, but will generally be held monthly and will be coordinated to coincide with Construction Meeting days for convenience. At the Commissioning Meetings, past Commissioning Process activities are reviewed, future Commissioning Process activities are planned and coordinated, Commissioning documentation is requested and exchanged, and the Commissioning Schedule is updated and integrated into the Construction Schedule. The CxA will request all documentation necessary to develop the installation checklists, requirements for equipment start-ups, pre-functional and

functional performance tests at these meetings and review the draft versions of these documents with the contractors that are responsible for implementing them. The CxA leads these meetings, records the minutes, and distributes the minutes with action items to all Cx Team members.

. 3.4 CONTRACTOR SUBMITTAL REVIEW The CxA will review the Contractor submittals coincident with the Design Team and provide comments to the Design Team for inclusion with their review so a single set of review comments can be provided to the Contractors. The reviewed submittals will include commissioned equipment and coordination drawings that include commissioned equipment and systems, control drawings and sequences, and interfaces and interlocks between systems. In addition, the CxA will periodically review the final Design Team comments to ensure a quality review process. The review will focus on operations, maintenance, and commissioning related issues with the goal of ensuring the submitted equipment complies with the Owner's Project Requirements. The CxA review will NOT include a detailed review of system capacities, sizes, and other technical data that are the responsibility of the Engineer of Record. CxA submittal reviews will frequently request additional information from the Contractors, including specific operations and maintenance data, performance curves, and targeted coordination drawings for areas of concern.

. 3.5 MAINTAIN ISSUES LOGS Throughout the Construction Process, the CxA will maintain a Commissioning Issues Log. This log will document all Construction Phase issues through a sortable database that identifies the following fields.

A. The responsible party, either Construction Team member, Design Team member, or Owner

B. The exact location of the issue (floor and room)

C. The applicable system component, i.e. lighting, ductwork, pump, etc.

D. The project impact

E. A severity

F. A deficiency code, i.e. craftsmanship, non-compliance, etc.

G. A reference to the Contract Documents (if applicable)

H. A detailed description of the issue

I. A status, i.e. complete, incomplete, accepted, unverifiable

. The issues log will be distributed and reviewed at each Commissioning Meeting and each issue will be tracked by the CxA until it is resolved.

. 3.6 CONSTRUCTION CHECKLISTS The Contractors will be responsible for completing documentation related to the installation, start- up, and testing of all commissioned equipment and systems. This documentation will be kept on- site and be completed through the use of paper forms. The CxA will develop the installation checklists and provide them in Adobe's portable document format (pdf) to the Construction Team. The Construction Team will be responsible for completing the installation checklists for 100% of the commissioned systems and equipment. The checklists will include best practices related to the specific equipment or system, highlights of required

installation details from the drawings and specifications, and equipment manufacturer, model number, serial number, and capacity verification information.

The construction manager or general contractor will be responsible for maintaining an up-to-date book of printed checklists. These checklists will be reviewed at every commissioning meeting with the expectation that checklists will be completed as the work progresses.

The CxA will use sampling strategies to field verify the proper completion of the checklists with sampling rates determined based upon the success of the verification process, the quantity of each type of equipment, and the relative importance of the equipment's operation related to the overall building operation.

The Functional Testing of the equipment and systems will not be scheduled until all relevant Installation Checklists are submitted to the Commissioning Agent.

. 3.7 PRE-FUNCTIONAL CHECKLISTS In order to verify that the systems and equipment are ready for final Functional Testing witnessed by the CxA, the Contractor will perform Pre-Functional Testing independent of the CxA. Pre- Functional Testing shall consist of performing the complete Functional Testing (described below) with tests provided by the CxA. Through this process, the Contractor will validate the test procedure and provide a marked-up version of the test complete with results. Once a completed test is provided indicating successful operation of the system, the CxA will schedule the Functional Testing as described below.

. 3.8 SITE OBSERVATIONS Periodically throughout the Construction process, the CxA will perform site visits to observe component and systems installations. These visits will be planned to coincide with selected planning and job-site meetings, installation milestones, component and assembly mock-ups, and equipment and system start-ups. The CxA will use these site visits to verify the proper completion of installation and start-up checklists, witness HVAC pipe and duct cleaning and testing, review the air and water systems balancing by selective testing, and generally track the progress of the construction. A field report will be provided at the conclusion of each visit documenting the tasks accomplished during the visit.

. 3.9 FUNCTIONAL TESTING The performance of the testing of all commissioned equipment and systems is the responsibility of the Contractors. The CxA will develop the functional performance tests with the assistance of the installing contractors, and upon the successful completion of Pre-Functional Testing as described above, will coordinate the testing process, and witness the tests that are performed by the Contractors. In addition, the CxA will prepare plans for, assist with execution of, and document tests of commissioned equipment overseen by regulatory authorities and ensure that such tests meet the rigor desired by the Owner. The CxA will coordinate the retesting of equipment until satisfactory performance is achieved. The functional performance testing will include operating the systems and components through each of the written sequences of operation, other significant modes and miscellaneous alarms, power failure, and security alarm when impacted by and interlocked with commissioned equipment. Sensors and actuators shall be calibrated during construction check listing by the installing contractors and spot checked by the CxA during functional testing. Tests on HVAC equipment shall be done, if possible, in their proper operating season (cooling in summer, heating in winter). Any equipment that operates in both seasons, such as the heat pumps, should ideally be tested in both seasons. However, if this is not possible, some manipulation of setpoints and control points will be done to simulate the necessary conditions. Functional testing will be done using conventional manual methods, control system trend logs, and stand-alone data loggers as required

to provide a high level of confidence in proper system function, as deemed appropriate by the CxA and the Owner. A report will be provided that includes all of the issues identified during the testing process.

As a component of the test procedures, the CxA will identify specific system trends to be set up and then analyze the trend and monitoring data as a method of verifying performance.

3.10 TRAINING AND O&M REVIEW

Planning for the training of the Owner’s operations and maintenance staff begins in the design phase with the development of training requirements.

The Owner's operations and maintenance staff will commence training sessions during the construction phase through a combination of formal and informal training activities. Although the informal training sessions, such a project walkthroughs or submittal reviews, will take place throughout the construction process, the formal training program should not be initiated until the successful completion of functional testing to ensure that the operations and maintenance personnel receive accurate training and are able to witness the systems operating properly during the training.

The CxA will oversee and approve the Contractor-provided training of the Owner's operating personnel. The training agendas, attendance logs, and materials will be documented by the CxA and any additional or supplemental training required for the Owner's operating personnel to properly and efficiently operate the building will be highlighted to the Owner by the CxA.

The CxA will attend select training sessions to participate, document, monitor, and provide quality control. The sessions will be video recorded by the Contractors or Owner without CxA involvement or coordination of the recording.

The CxA will review and approve the commissioned systems and equipment sections of the Operations and Maintenance (O&M) manuals prepared by the Contractors. Comments will be provided to the Design Team to allow one submittal review to be sent to the Contractor. The Contractor is to have the O&M manuals ready and available for use in the training process.

PART 4 OCCUPANCY AND OPERATIONS PHASE

. 4.1 FINAL COMMISSIONING PROCESS REPORT At the completion of the Commissioning Process, the CxA will provide a final report based on the framework of the Commissioning Plan. An Executive Summary will be included that provides a summary of the participants and their roles, a brief building description, an overview of the commissioning and testing scope, and a general description of testing and verification methods. Included with the summary will be a matrix that provides the disposition of the CxA regarding the adequacy of the commissioned equipment and system in the following five areas: equipment meeting the equipment specifications, equipment installation, functional performance and efficiency, equipment documentation, and operator training. The final report will specifically identify all outstanding non-compliance issues, recommendations for improvement to equipment or operations, future actions required, and recommended changes to the Commissioning Process. In addition, the Report shall include a final issues log with all issues identified through the Commissioning Process, progress and field reports, submittal and O&M manual reviews, training record, test schedules, construction checklists, start-up reports, functional tests, and trend log analysis.

. 4.2 SEASONAL TESTING

Any equipment or system that cannot be adequately tested at the time of the initial testing due to seasonal operating issues will be retested in their primary operating season. Whenever possible, systems will be tested under load to verify system capacity and function.

. 4.3 WARRANTY REVIEW The CxA will return to the site 10 months into the 12 month warranty period and review with facility staff the current building operation and condition of outstanding issues related to the original and seasonal commissioning. Any issues that may come under warranty or under the original construction contract will be identified and the CxA will assist the

facility staff in developing reports, documents, and requests for services to remedy outstanding problems. The CxA is not responsible for correcting deficiencies.

. 4.4 HIGH PERFORMANCE BUILDING RATING SYSTEMS In addition to the reports described above, all paperwork required to satisfy the RIDE Regulations will be provided.

END OF SECTION

SECTION 02 4113
SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

B. Removal and disposal of obsolete equipment.

C. Abandonment and removal of obsolete utilities and conduit.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of benchmarks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

PART 2 PRODUCTS – Not Applicable to this Section

PART 3 EXECUTION

3.01 SCOPE

A. Remove portions of the existing construction as required to install new work.

B. Remove equipment being replaced.

C. Remove & Provide Safe Storage for Existing-to-Remain Equipment as Applicable

D. Remove MEP and other items being upgraded or replaced.

E. Remove items so noted on the drawings.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.

4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
6. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

D. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

E. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

A. Protect existing utilities to remain from damage.

B. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

D. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

E. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Separate areas in which demolition is being conducted from other areas that are still occupied.
1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 3000

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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. Related Sections include the following:
1. Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.
2. Division 2 Section "Cement Concrete Pavement" for concrete pavement and walks.
3. Division 3 Section "Concrete Toppings" for metallic and nonmetallic concrete floor toppings.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
1. Indicate amounts of mix water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

D. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

E. Welding Certificates: Copies of certificates for welding procedures and personnel.

F. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for formwork and shoring and reshoring installations that are similar to those indicated for this Project in material, design, and extent.

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

G. ACI Publications: Comply with the following, unless more stringent provisions are indicated:
1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. 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 mixes.
c. Concrete subcontractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.
   1. Avoid damaging coatings on steel reinforcement.
   2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963M.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      a. High-density overlay, Class 1, or better.
      b. Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.
      c. Structural 1, B-B, or better, mill oiled and edge sealed.
      d. B-B (Concrete Form), Class 1, or better, mill oiled and edge sealed.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

D. Form Ties:
   1. Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   2. Furnish units that will leave no corrodible metal closer than 1-1/2" inch to the plane of the exposed concrete surface.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M, and as follows:
   1. Steel Reinforcement: ASTM A 615/A 615M, Grade 60, deformed.

C. Plain-Steel Wire: ASTM A 82, as drawn.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

B. Joint Dowel Bars: Stainless Steel Bars. Cut bars true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

A. Portland Cement for foundation walls and footings: ASTM C 150, Type I.
   1. Fly Ash: ASTM C 618, Class F.

B. Portland Cement for slabs on grade: ASTM C 150, Type II or V.
   1. Fly Ash: ASTM C 618, Class F.

C. Blended Hydraulic Cement: ASTM C 595M, Type I (PM), pozzolan-modified portland cement.

D. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
   1. Class: Severe weathering region, but not less than 3S.
   2. Nominal Maximum Aggregate Size: 3/4 inch.

E. Water: Potable and complying with ASTM C 94.

2.5 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

G. 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.
   1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Catexol 1000CL; Axim Concrete Technologies.
      b. MCI 2000 or MCI 2005; Cortec Corporation.
      c. DCI or DCI-S; W. R. Grace & Co., Construction Products Div.

d. Rheocrete 222+; Master Builders, Inc.
e. FerroGard-901; Sika Corporation.

H. FIBER REINFORCEMENT

I. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches lo

2.6 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
1. Profile: As indicated.

B. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
1. Profile: As indicated.

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Rubber Waterstops:
a. Greenstreak.
b. Progress Unlimited Inc.
c. Westec Barrier Technologies; Div. of Western Textile Products, Inc.
2. PVC Waterstops:
a. Greenstreak.
b. Meadows: W. R. Meadows, Inc.
c. Vinylex Corporation.

D. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophylic material for adhesive bonding to concrete.
1. Products: Subject to compliance with requirements, provide one of the following:
a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.
b. Hydrotite; Greenstreak.
c. Mirastop; Mirafi Moisture Protection, Div. of Royal Ten Cate (USA), Inc.

2.7 VAPOR RETARDERS

A. Vapor Retarder: ASTM E 1745, Class B, five-ply, nylon- or polyester-cord-reinforced, high-density polyethylene sheet; 15 mils thick.
1. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, "Griffolyn T-85" by Reef Industries Inc.

B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and

10 to 30 percent passing a No. 100 sieve; meeting deleterious substance limits of ASTM C 33 for fine aggregates.

2.8 FLOOR AND SLAB TREATMENTS

A. Penetrating Liquid Floor Treatment: Chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.

2.9 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. dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

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

2.10 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
   1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
   2. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Reglets: Fabricate reglets of not less than 0.0217-inch- thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

E. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.11 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
   1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Footings and Foundation Walls: Proportion normal-weight concrete mix as follows:
   1. Compressive Strength (28 Days): 3000 psi.
   2. Maximum Water-Cementitious Materials Ratio: 0.48
   3. Maximum Slump: 4 inches.
   4. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 6 inches after admixture is added to concrete with 2- to 4-inch slump.

D. Slab-on-Grade: Proportion normal-weight concrete mix as follows:
   1. Compressive Strength (28 Days): 4000 psi.
   2. Maximum Water-Cementitious Materials Ratio: 0.42
   3. Minimum Cementitious Materials Content: 560 lb/cu. yd..
   4. Maximum Slump: 4 inches.

E. Suspended Slabs: Proportion normal-weight concrete mix as follows:
   1. Compressive Strength (28 Days): 4000 psi.
   2. Maximum Water-Cementitious Materials Ratio: 0.43
   3. Minimum Cementitious Materials Content: 550 lb/cu. yd..
   4. Maximum Slump: 4 inches.

F. Cementitious Materials: For concrete exposed to deicers, limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements.

G. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete required to have low water permeability.

H. Maximum Water-Cementitious Materials Ratio: 0.42 for concrete exposed to deicers or subject to freezing and thawing while moist.

I. Maximum Water-Cementitious Materials Ratio: 0.42 for corrosion protection of steel reinforcement in concrete exposed to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater, or spray from these sources.

J. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:
   1. Air Content: 6 percent for 3/4-inch- nominal maximum aggregate size.

K. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

L. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) 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, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixes where indicated.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
1. Class B, 1/4 inch.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 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. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor bolts, accurately located, to elevations required.
   2. Install reglets to receive top edge of foundation sheet 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. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:
   1. At least 70 percent of 28-day design compressive strength.
   2. Determine compressive strength of in-place concrete by testing representative field- or laboratory-cured test specimens according to ACI 301.

C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES

A. Comply with ACI 318, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

3.5 VAPOR RETARDERS

A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.

B. Fine-Graded Granular Material: Cover vapor retarder with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain specified minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.
   2. All welded wire-fabric on slabs shall be supported by concrete bricks or chair supports at not more than 4’-0” on center each way.
   3. All reinforcing shall be securely tied prior to casting of concrete so as to avoid displacement of reinforcing. Contractor is responsible for ensuring that necessary measures are taken, whether shown in contract documents or not, to ensure that reinforcing is adequately tied and/or supported.
   4. “Laying in” of reinforcing during casting of concrete is not permitted.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

3.7 JOINTS

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

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated on drawings or if not shown, so as to divide slab into areas not in excess of 800 square feet. Form contraction joints as shown on Construction Drawings. Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Joints should be cut prior to initial cracking of concrete; or within 4- 12 hours of casting, depending on project conditions. As an alternate, contraction joints may be formed used molded inserts set prior to hardening of slab.

D. Isolation Joints in Slabs-on-Grade: 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.
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 Division 7 Section "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. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.
1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

A. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, bonding or mechanically fastening and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement.
   1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
   1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate. Do not vibrate forms or reinforcement.

E. 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. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Maintain reinforcement in position on chairs during concrete placement.
   3. Screed slab surfaces with a straightedge and strike off to correct elevations.
   4. Slope surfaces uniformly to drains where required.
   5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
   2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

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

3.11 FINISHING FLOORS AND SLABS

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

1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
2. Finish surfaces to the following tolerances according to ASTM E1155 for a randomly trafficked floor surface.

C. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated and to floor and slab 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
2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:
    a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25, relative to specified slope; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17, relative to specified slope; for slabs-on-grade.

D. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete 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: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R 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 according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
   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. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.14 LIQUID FLOOR TREATMENTS

A. 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 in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat

holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. 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 will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

B. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include 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.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

C. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

D. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix 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 will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
   4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
   5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
   6. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
   7. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days, two at 28 days and hold the ffifth for possible future testing.
      a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. Strength of each concrete mix 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.

D. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

E. 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.

F. Additional Tests: 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 03 30 00

SECTION 04 8100

REINFORCED MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:
   1. Concrete masonry units.
   2. Decorative concrete masonry units.
   3. Mortar and grout.
   4. Reinforcing steel.
   5. Masonry joint reinforcement.
   6. Ties and anchors.
   7. Miscellaneous masonry accessories.

B. Related Sections include the following:
   1. Section 03300, Cast-in-Place Concrete
   2. Section 05120, Structural Steel
   3. Section 05210, Open Web Steel Joists
   4. Division 7, Bituminous Dampproofing
   5. Division 7, Water Repellents
   6. Division 7, Section Sheet Metal Flashing and Trim
   7. Division 7, Firestopping

C. Products furnished, but not installed, under this Section include the following:
   1. Dovetail slots for masonry anchors, Section 03300, Cast-In-Place Concrete
   2. Adjustable masonry anchors welded to structural steel frame, Section 05120, Structural Steel

D. Products installed, but not furnished, under this Section include the following:
   1. Steel lintels for unit masonry
   2. Flashing reglets in masonry joists, Division 7

1.03 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry by testing masonry prisms according to ASTM C 1314.
   1. For Concrete Unit Masonry: f'm = 1500 psi.

B. Masonry Grout: 3000 psi compressive strength at 28 days.

1.04 SUBMITTALS

A. Comply with provisions of Section 01330.

B. Product Data: For each different masonry unit, accessory, and other manufactured product specified.
C. Shop Drawings: Show fabrication and installation details for the following:
   1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
   2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
D. Samples for Verification: For the following:
   1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
   2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.
   3. Weep holes/vents in color to match mortar color.
   4. Accessories embedded in the masonry.
E. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
   1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents, unless such deviations are specifically brought to the attention of the Architect and approved in writing.
F. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
G. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:
   1. Each type of masonry unit required.
      a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
      b. Include test results, measurements, and calculations establishing net-area compressive strength of masonry units.
   2. Mortar complying with property requirements of ASTM C 270.
   3. Grout mixes complying with compressive strength requirements of ASTM C 476. Include description of type and proportions of grout ingredients.
H. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
   1. Each type of masonry unit required.
      a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
      b. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.
   2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
   3. Each combination of masonry unit type and mortar type. Include statement of net-area compressive strength of masonry units, mortar type, and net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

4. Each material and grade indicated for reinforcing bars.
5. Each type and size of joint reinforcement.
6. Each type and size of anchor, tie, and metal accessory.

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

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

1.05 QUALITY ASSURANCE

A. Comply with provisions of Section 01400.

B. Refer to architectural wall types and architectural drawings for additional information not provided in specifications.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.

D. 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, through one source from a single manufacturer for each product required.

E. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

F. Preconstruction Testing Service: Engage a qualified independent testing agency to perform the following preconstruction testing:
   1. Concrete Masonry Unit Test: For each concrete masonry unit indicated, per ASTM C 140.
   2. Prism Test: For each type of wall construction indicated, per ASTM C 1314. Three total for entire project.
   3. Mortar Test: For mortar properties per ASTM C 270.
   4. Grout Test: For compressive strength per ASTM C 1019.

G. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

H. Mockups: Before installing unit masonry, build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
   1. Locate mockups in the locations indicated or, if not indicated, as directed by Architect.
   2. Build mockup of typical wall area as shown on Drawings.
   3. Build mockups for the following types of masonry in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories. Include a sealant-filled joint at least 16 inches long in each mockup.
      a. Each type of exposed unit masonry construction.
      b. Typical exterior wall.
      c. Typical exterior wall with through-wall flashing installed for a 24-inch length in corner of mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).

d. Typical interior unit masonry wall.

4. Clean exposed faces of mockups with masonry cleaner as indicated.
5. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
6. Notify Architect seven days in advance of dates and times when mockups will be constructed.
7. Protect accepted mockups from the elements with weather-resistant membrane.
8. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
9. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
   a. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
10. Demolish and remove mockups when directed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01600.
B. 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.
   1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.
C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
E. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.07 PROJECT 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 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. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
   1. When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

1.08 REFERENCE STANDARDS

A. ACI 530/ASCE 5/TMS 402: Building Code Requirements for Masonry Structures
B. ACI 530.1/ASCE 6/TMS 602: Specification for Masonry Structures
C. ASTM A82: Standard Specification for Steel Wire Pland for Concrete Reinforcement
D. ASTM C90: Standard Specification for Load bearing Concrete Masonry Units
E. ASTM C144: Standard Specification for Aggregate for Masonry Mortar
F. ASTM C150: Standard Specification for Portland Cement
G. ASTM C207: Standard Specification for Hydrated Lime for Masonry Purposes
H. ASTM C270: Standard Specification for Mortar for Unit Masonry
I. ASTM C404: Standard Specification for Aggregates for Masonry Grout
J. ASTM C476: Standard Specification for Grout for Masonry
K. ASTM C780: Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
L. ASTM C1019: Standard Test Method for Sampling and Testing Grout
M. ASTM C1314: Standard Test Method for Compressive Strength of Masonry Prisms
N. AWS D1.4: American Welding Society Structural Welding Code – Reinforcing Steel

PART 2 - PRODUCTS

2.01 See architectural wall types and architectural drawings for information not provided in specifications. Coordinate all requirements between drawings and specifications.

2.02 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:
   1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
   2. Provide bullnose units for outside corners, unless otherwise indicated.
B. Concrete Masonry Units (Decorative and Standard): ASTM C 90
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
   2. Weight Classification: Normal weight, unless otherwise indicated.
   3. Provide Type I, moisture-controlled units.
   4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

2.03 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, 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.
B. Hydrated Lime: ASTM C 207, Type S.
C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
D. Mortar Cement: ASTM C 1329.
E. Masonry Cement: ASTM C 91.
   1. For pigmented mortar, use a colored cement formulation as required to produce the color indicated or, if not indicated, as selected from manufacturer's standard formulations.
   2. For colored-aggregate mortar, use natural color or white cement as necessary to produce required mortar color.
F. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
   1. White-Mortar Aggregates: Natural white sand or ground white stone.
   2. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.
G. Aggregate for Grout: ASTM C 404.
H. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
I. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for structural-clay tile facing units (and approved for such use by manufacturer of the units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.
J. Water: Potable.

2.04 REINFORCING STEEL

A. Comply with reinforcing requirements in Section 03300, Cast-in-Place Concrete.
B. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; Grade 60.
C. Epoxy-Coated Reinforcing Steel: ASTM A 615/A 615M, Grade 60; epoxy coated to comply with ASTM A 775/A 775M.

2.05 MASONRY JOINT REINFORCEMENT

A. General: ASTM A 951 and as follows:

1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
2. Wire Size for Side Rods: W2.8 or 0.188-inch diameter.
3. Wire Size for Cross Rods: W2.8 or 0.188-inch diameter.
4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units where indicated.

B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.

C. For multiwythe masonry, provide types as follows:
1. Ladder type with perpendicular cross rods spaced not more than 16 inches o.c. and 1 side rod for each face shell of hollow masonry units more than 4 inches in width, plus 1 side rod for each wythe of masonry 4 inches or less in width.
2. Adjustable (2-piece) type with single pair of side rods and cross ties spaced not more than 16 inches o.c. and with separate adjustable veneer ties engaging the cross ties. Cross ties are either U-shaped with eyes or rectangular. Space side rods for embedment within each face shell of backup wythe and size adjustable ties to extend at least halfway through outer wythe but with at least 5/8-inch cover on outside face.
   a. Use where indicated and where horizontal joints of facing wythe do not align with those of backup wythe.

2.06 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

D. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.07 BENT WIRE TIES

A. General: Rectangular units with closed ends and not less than 4 inches wide. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.
1. Where coursing between wythes does not align, use adjustable ties composed of 2 parts; 1 with pintles, the other with eyes; with maximum misalignment of 1-1/4 inches.

B. Wire: Fabricate from 3/16-inch- 1/4-inch- diameter, hot-dip galvanized steel wire.

2.08 ANCHORS FOR CONNECTING TO CONCRETE

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section: Dovetail anchor section formed from 0.0528-inch- thick, steel sheet, galvanized after fabrication .
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.1875-inch- diameter, hot-dip galvanized steel wire.

2.09 RIGID ANCHORS

A. General: Fabricate from steel bars as follows:
1. 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins.
2. Finish: Hot-dip galvanized to comply with ASTM A 153.

2.10 ADJUSTABLE MASONRY-VENEER ANCHORS

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
   1. Anchor Section: Zinc-alloy barrel section with flanged head with eye and corrosion-resistant, self-drilling screw. Eye designed to receive tie section and to serve as head for drilling fastener into framing. Barrel length to suit sheathing thickness, allowing screw to seat directly against framing with flanged head covering hole in sheathing.
   2. Wire Tie Section: Rectangular- shaped wire tie sized to extend at least halfway through veneer but with at least 5/8-inch cover on outside face.
   3. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0677-inch-thick, steel sheet, galvanized after fabrication .
   4. Fabricate wire tie sections from 0.1875-inch- diameter, hot-dip galvanized steel wire.

2.11 MISCELLANEOUS ANCHORS

A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
   1. Headed bolts.
   2. Nonheaded bolts, bent in manner indicated.

B. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
   1. Type: Chemical anchors.
   2. Type: Expansion anchors only as noted on drawings.
   3. For Postinstalled Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

2.12 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from PVC.

B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches.

E. Wicking Material: Cotton or polyester rope, 1/4 to 3/8 inch in diameter, in length required to produce 2-inch exposure on exterior and 18 inches in cavity between wythes.

F. Plastic Weep Hole/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, designed to fill head joint with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.

G. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch steel wire, hot-dip galvanized after fabrication.

2.13 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.

B. Proprietary 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.

2.14 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.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the 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, Property Specification.
   1. For masonry below grade, in contact with earth, and where indicated, use Type M.
   2. For reinforced masonry and where indicated, use Type S.

D. Colored-Aggregate Mortar: Produce required mortar color by using colored aggregates combined with selected cementitious materials.
   1. Mix to match Architect's sample.

E. Grout for Unit Masonry: Comply with ASTM C 476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Provide grout with a slump of 9 inches (+/- one inch) as measured according to ASTM C 143.

F. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's directions.

2.15 SOURCE QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform source quality-control testing indicated below:
   1. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Brick Tests: For each type and grade of brick indicated, units will be tested according to ASTM C 67.

C. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
   2. Verify that foundations are within tolerances specified.
   3. Verify that reinforcing dowels are properly placed.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.02 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, 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.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

3.03 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.

E. 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.

3.04 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: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
   1. One-half running bond with vertical joint in each course centered on units in courses above and below.
   2. As indicated on Drawings.

C. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
E. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.
F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
G. Fill cores in hollow concrete masonry units with grout 24 inches under anchor bolt locations unless otherwise indicated.

3.05 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:
   1. With full mortar coverage on horizontal and vertical face shells.
   2. Bed webs in mortar.
   3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
   4. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the brick.

3.06 CAVITIES

A. Keep cavities clean of mortar droppings, debris, and other materials during construction. Strike joints facing cavities flush.
   1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.
B. 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.

3.07 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. 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. Space reinforcing a maximum of 16” on center.
B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.08 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 16 inches o.c.

3.09 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:
   1. Fasten each anchor section with two metal fasteners of type indicated.
   2. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around the perimeter.

3.10 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated or a maximum of 25 feet on center. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
B. Form control joints in concrete masonry as follows:
   1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces.
   2. Install preformed control-joint gaskets designed to fit standard sash block.
   3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

3.11 LINTELS

A. Install steel lintels where indicated or as required for masonry openings shown on drawings. Lintel sizes to be sufficient to support weight of masonry and deflection requirements.
B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
   1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.12 FLASHING, WEEP HOLES, AND 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.
B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, 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 as recommended by flashing manufacturer.
   1. Cut flashing off flush with face of wall after masonry wall construction is completed.

C. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:
   1. Use rectangular plastic tubing, plastic weep hole/vents, or vinyl weep hole/vents, to form weep holes.
   2. In cavities, place pea gravel to a height equal to height of first course, but not less than 2 inches, immediately above top of flashing embedded in the wall, as masonry construction progresses, to splatter mortar droppings and to maintain drainage.

3.13 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
   1. Construct formwork to conform to shape, line, and dimensions shown. Make it sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
   1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.14 FIELD QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below.
   1. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.

C. Mortar properties will be tested per ASTM C 780.

D. Grout will be sampled and tested for compressive strength per ASTM C 1019.

E. Brick Tests: For each type and grade of brick indicated, units will be tested according to ASTM C 67.

F. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

G. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM C 1314, and as follows:
   1. Two prisms for the All-Purpose Room
   2. Two prisms for all other masonry.

3.15 REPAIRING, POINTING, AND CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. 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, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.16 MASONRY WASTE DISPOSAL

A. Recycling: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Disposal as Fill Material: Dispose of clean masonry waste, including broken masonry units, waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

C. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 81 00

SECTION 05 1200

STRUCTURAL STEEL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Structural steel.
   2. Base, leveling, and bearing plates.
   3. Architecturally exposed structural steel.
   4. Grout.

B. Work Furnished but Installed by Others
   1. Anchorages cast into concrete and masonry.
   2. Lintels installed in masonry.

C. Related Sections include the following:
   1. Division 3, Cast-In-Place Concrete
   2. Division 4, Unit Masonry Assemblies
   3. Division 5, Open Web Steel Joists
   4. Division 5, Steel Deck
   5. Division 9, Painting

1.03 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC's "Code of Standard Practice for Steel Buildings and Bridges," that support design loads.

B. Architecturally Exposed Structural Steel: Structural steel designated as architecturally exposed structural steel in the Contract Documents or shown as exposed through the use of building sections, wall sections, and elevations.

1.04 REFERENCE STANDARDS

A. AISC – Manual of Steel Construction, Allowable Stress Edition, 9th Edition
B. AISC – Code of Standard Practice for Steel Buildings and Bridges
C. AISC – Specification for Structural Joints using ASTM A325 or A490 Bolts

D. ASTM A6 – General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for structural use
E. ASTM A36 – Carbon Structural Steel
F. ASTM A53 – Welded and Seamless Steel Pipe
G. ASTM A108 – Steel Bars, Carbon, Cold Finished Standard Quality
H. ASTM A123 – Zinc Hot Galvanized Coatings on Iron and Steel Products
I. ASTM A242 – High-Strength Low-Alloy Structural Steel
J. ASTM A307 – Carbon Steel Bolts and Studs
K. ASTM A325 – High Strength Bolts for Structural Steel Joints, including Suitable Nuts and Plain Hardened Washers
L. ASTM A434 – Steel Bars, Alloy, Quenched and Tempered
M. ASTM A449 – Quenched and Tempered Steel Bolts and Studs
N. ASTM A490 – Heat Treated Structural Steel Bolts
O. ASTM A500 – Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
P. ASTM A501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
Q. ASTM A992 – Standard Specification for Steel for Structural Shapes For Use in Building Framing
R. ASTM 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
S. ASTM 1011 – Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
T. ASTM C1107 – Packaged Dry, Hydraulic-Cement Grout (Non-shrink)
U. AWS – Standard Qualification Procedure
V. AWS A2.4 – Standard Symbols for Welding, Brazing, and Non-destructive Examination
W. AWS – D1.1 – Structural Welding Code
X. OSHA 1926 29 CFR – Safety and Health Regulations for Construction
Y. SSPC SP-2 – Hand Tool Cleaning
Z. SSPC SP-3 – Power Tool Cleaning

1.05 PERFORMANCE REQUIREMENTS

A. Connections: Provide details of simple shear and moment resisting connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.
   1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction, Allowable Stress Design," Part 4.
   2. Engineering Responsibility: Fabricator's responsibilities include using a qualified professional engineer registered in the State of RI to prepare structural analysis data for moment resisting beam to column structural-steel connections. Analysis to be stamped and signed.

B. Construction: Type 1 and 2, simple span and fully rigid framing.

1.06 SUBMITTALS

A. Comply with provision in Division 1. Submit a maximum of four sets.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication of structural-steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment drawings.
   3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
   4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
   5. Include moment resisting structural-steel connections to be in compliance with design loads. Provide complete structural analysis data, signed and sealed by the qualified professional engineer responsible for their preparation who is licensed in the State of Rhode Island. Both the moment and shear components of the connection are to be included in the analysis.

D. Welding certificates.

E. Mill Test Reports: Signed by manufacturers certifying that the following products comply with requirements:
   1. Structural steel including chemical and physical properties.
   2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   3. Direct-tension indicators.
   4. Tension-control, high-strength bolt-nut-washer assemblies.
   5. Shear stud connectors.
   6. Shop primers.
   7. Nonshrink grout.

F. Source quality-control test reports.

G. Submit data on shop primer indicating adhesion compatibility with spray on fireproofing.

1.07 QUALITY ASSURANCE

A. Comply with provisions in Division 1.
B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
C. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category Cbd.
D. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
E. Comply with applicable provisions of the following specifications and documents:
   1. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
   3. AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
   4. AISC's "Specification for the Design of Steel Hollow Structural Sections."
   5. AISC's "Specification for Allowable Stress Design of Single-Angle Members."
   6. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

F. Mockups: Build mockups of architecturally exposed structural steel to set quality standards for fabrication and installation.
   1. Coordinate finish painting requirements with Division 9 painting Sections.
   2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01310 - Project Management and Coordination.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Comply with provisions in Division 1.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
   1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
   2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

C. Deliver materials to the site at such intervals to ensure uninterrupted progress of the work.

1.09 COORDINATION

A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.01 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992 or ASTM A 572, Grade 50.
B. Channels, Angles, M, S-Shapes: ASTM A 36.
C. Plate and Bar: ASTM A 36.
D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
E. Steel Pipe: ASTM A 53, Type E or S, Grade B.
F. Medium-Strength Steel Castings: ASTM A 27, Grade 65-35, carbon steel.
G. High-Strength Steel Castings: ASTM A 148, Grade 80-50, carbon or alloy steel.
H. Welding Electrodes: E70xx, comply with AWS requirements.

2.02 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 or ASTM A 490, Type 1, heavy hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers, plain.
   1. Finish: Plain.
   2. Direct-Tension Indicators: ASTM F 959, compressible-washer type
   3. Tension-Control Assemblies: ASTM F 1852

B. Unheaded Anchor Rods: ASTM A 307, Grade A.
   1. Configuration: Hooked.
   2. Nuts: ASTM A 563 hex carbon steel.
   3. Plate Washers: ASTM A 36 carbon steel.
   4. Washers: ASTM F 436 hardened carbon steel.
   5. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.

C. Threaded Rods: ASTM A 193.
   1. Nuts: ASTM A 563 hex carbon steel.
   2. Washers: ASTM A 36 carbon steel.
   3. Finish: Plain.

2.03 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer when used without fireproofing materials.

B. When intumescent is specified, primer paint is to be compatible.

C. Galvanizing Repair Paint: ASTM A 780, minimum 95% metallic zinc by weight.

D. Steel exposed to exterior weather is to have high performance coating system or be hot dipped galvanized.

2.04 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.05 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."
   1. Identify high-strength structural steel according to ASTM A 6 and maintain markings until structural steel has been erected.
   2. Mark and match-mark materials for field assembly.
   3. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.
   1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, seam marks, roller marks, rolled trade names, and roughness.
   2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning and SSPC-SP 3, "Power Tool Cleaning."

F. Holes:
   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Base-Plate Holes: Cut, drill, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

G. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

I. Fabricate beams and girders with positive camber when composite with the concrete slab. Prescribe enough camber to counteract dead load of concrete slab and framing. Amount of camber is to be indicated on submitted shop drawings.

2.06 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

   1. Joint Type: Pretensioned.

B. Weld Connections: E70xx in compliance with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
   1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
   2. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
      a. Grind butt welds flush.

b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

2.07 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.
   1. Galvanize loose lintels and relieving angles attached to structural-steel frame and located in exterior walls.
   2. Galvanize steel as noted on drawings.

2.08 SOURCE QUALITY CONTROL

A. Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

   1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:
   1. Liquid Penetrant Inspection: ASTM E 165.
   2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   3. Ultrasonic Inspection: ASTM E 164.
   4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:
   1. Bend tests will be performed if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
   2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments, with steel erector present, for compliance with requirements.

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

3.02 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

3.03 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design."

B. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.
   1. Set bearing and leveling plates for structural members on leveling grout as required.
   2. Pretension anchor rods after supported members have been positioned and plumbed.
   3. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.

G. Do not use thermal cutting during erection.

H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

I. Touch-up Painting: immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint. Apply paint to exposed areas with the same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

Use galvanizing repair paint to correct damaged or abraded areas of galvanized members and to cover and protect field welds in galvanized members

3.04 FIELD CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Pretensioned.

B. Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings--Allowable Stress Design and Plastic Design " for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
   a. Grind butt welds flush.
   b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: All field welds will be visually inspected according to AWS D1.1.
1. In addition to visual inspection, 10% of all field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.06 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates, and abutting structural steel.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 9 painting Sections.

D. Any field alterations are to be submitted as a drawing to the architect prior to implementation. Submitted drawing is to show field conditions and work to be performed including, but not limited to member sizes, tolerances, weld sizes and length, and connection information. Proposed field alteration is subject to approval by architect or engineer.

END OF SECTION 05 12 00

SECTION 06 4023
INTERIOR ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

A. Provide interior finish carpentry, architectural woodwork and countertops.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

B. Standards: Architectural Woodwork Institute (AWI) 'Architectural Woodwork Standards.'

C. Preservative Treatment: Nonpressure method, exterior type, AWPA N1

D. Fire-Retardant Treatment:
1. Lumber: AWPA C20, non-corrosive type.
2. Plywood: AWPA C27, non-corrosive type.
3. Particleboard: ASTM E 84, flame spread 20 or less.

E. Wood Products: Comply with the following:
1. Hardboard: AHA A135.4.
2. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.
3. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
5. Hardwood Plywood and Face Veneers: HPVA HP-1.

F. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship of each type of finish carpentry.

PART 2 PRODUCTS

2.1 MATERIALS

A. Interior Standing and Running Trim and Rails:
1. Species for Opaque Finish: White pine or sugar pine.
2. Grade: Custom.

B. Interior Wood Casework:
1. Species for Transparent Finish: Plain sawn/sliced natural birch.
2. Grade: Custom.

3. Face Style: Flush.
4. Frame Fabrication: Face frame.
5. Veneer Matching of Leaves: Slip.
6. Veneer Matching In Panel Face: Slip.

C. Interior Plastic Laminate Clad Casework:
1. Grade: Custom.
2. Face Style: Flush overlay.
3. Frame Fabrication: Face frame.

D. Interior Casework Hardware and Auxiliary Materials:
1. Hardware Finish and Base Metal: Satin stainless steel.
2. Glass: Clear tempered glass, ASTM C 1048.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide work to sizes, shapes, and profiles indicated. Install work to comply with quality standards referenced. Back prime work and install plumb, level and straight with tight joints; scribe work to fit.

B. Quality Standard: Install woodwork to comply with AWI standards for the same grade specified for type of woodwork involved.

C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.

D. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.

E. Repair minor damage, clean and protect.

END OF SECTION

SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a.

B. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

1.04 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

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

C. Installer Qualifications: Company specializing in performing the work of this section and:
   1. Trained by the manufacturer.
   2. Licensed by authority having jurisdiction.

1.05 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING - GENERAL REQUIREMENTS

A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.03 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E814 that has F Rating equal to fire rating of penetrated assembly and T Rating Equal to F Rating and that meets all other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

B. Do not cover installed firestopping until inspected by authority having jurisdiction.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing.

B. Gypsum wallboard.

C. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 07 9200 - Joint Sealants: Sealing gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

G. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014a.

I. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2015.

J. GA-216 - Application and Finishing of Gypsum Board; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:

1. Clarkwestern Dietrich Building Systems LLC; www.clarkdietrich.com.
2. Marino; www.marinoware.com.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
1. Studs: "C" shaped with flat or formed webs with knurled faces.
2. Runners: U shaped, sized to match studs.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
1. American Gypsum Company; www.americangypsum.com.
2. Georgia-Pacific Gypsum; www.gpgypsum.com.
3. National Gypsum Company; www.nationalgypsum.com.
4. USG Corporation; www.usg.com.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Thickness:
   a. Vertical Surfaces: 5/8 inch (16 mm).
3. Paper-Faced Products:
   a. American Gypsum Company; LightRoc Gypsum Wallboard.
   b. Georgia-Pacific Gypsum; ToughRock.

C. Impact Resistant Wallboard:
1. Application: High-traffic areas indicated.
2. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
5. Thickness: 5/8 inch (16 mm).
6. Edges: Tapered.

2.04 ACCESSORIES

A. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel, or rolled zinc, unless noted otherwise.
1. Corner Beads: Low profile for tape embedment, for 90 degree outside corners and archways.
2. J-Beads: for tape embedment, at all joints to dissimilar materials

B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
2. Ready-mixed vinyl-based joint compound.

C. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

D. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center (at 406 mm on center).
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

C. Blocking: Install wood blocking for support of:
   1. Wall mounted door hardware.
   2. Visual Display Monitors
   3. White boards

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim (J Bead): Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

END OF SECTION

SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal partition, ceiling, and soffit framing.

B. Framing accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking within stud framing.

B. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

C. Section 08 3100 - Access Doors and Panels.

D. Section 09 2116 - Gypsum Board Assemblies: Metal studs for gypsum board partition framing.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2013.

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007 (Reapproved 2013).

H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

I. ASTM E413 - Classification for Rating Sound Insulation; 2010.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
   2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.

C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing, Connectors, and Accessories:
   1. CEMCO: www.cemcosteel.com.
   2. Clarkwestern Dietrich Building Systems LLC: www.clarkdeitrich.com.
   3. Marino: www.marinoware.com.
   4. Simpson Strong Tie: www.strongtie.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FRAMING MATERIALS

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
   1. Studs: C shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).

B. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.

D. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud.

E. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.

F. Fasteners: ASTM C1002 self-piercing tapping screws.

G. Anchorage Devices: Powder actuated.

H. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: fill wall cavity.

I. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board. Refer to section 07 9005 Joint Sealers.

2.03 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that rough-in utilities are in proper location.

3.02 INSTALLATION OF STUD FRAMING

A. Comply with requirements of ASTM C754.

B. Extend partition framing to structure where indicated and to ceiling in other locations.

C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

D. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

E. Align and secure top and bottom runners at 24 inches (600 mm) on center.

F. At partitions indicated with an acoustic rating:
   1. Provide components and install as required to produce STC rating of 45-49, based on published tests by manufacturer conducted in accordance with ASTM E90 with STC rating calculated in accordance with ASTM E413.
   2. Place one bead of acoustic sealant between runners and substrate, studs and adjacent construction.
   3. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.

G. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

H. Install studs vertically at 16 inches (400 mm) on center.

I. Align stud web openings horizontally.

J. Secure studs to tracks using crimping method. Do not weld.

K. Fabricate corners using a minimum of three studs.

L. Double stud at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.

M. Brace stud framing system rigid.

N. Coordinate erection of studs with requirements of door frames; install supports and attachments.

O. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.

P. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures.

3.03 CEILING AND SOFFIT FRAMING

A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.

B. Install furring independent of walls, columns, and above-ceiling work.

C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.

D. Space main carrying channels at maximum 72 inch (1 800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.

E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

F. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.

G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches (600 mm) past each opening.

H. Laterally brace suspension system.

3.04 TOLERANCES

A. Maximum Variation From True Position: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation From Plumb: 1/8 inch in 10 feet (3 mm in 3 m).

END OF SECTION

SECTION 14 2100
ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.01 Summary

A. This section specifies electric traction elevators.

B. Work Required

1- The work required under this section consists of all labor, materials and services required for the complete installation (including operational verification) of all the equipment required for the elevator(s) as herein specified.

2- All work shall be performed in a first class, safe and workmanlike manner.

3- In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts as are required to make complete installation.

1.02 Related Sections

A. The following sections contain requirements that relate to this section and are performed by trades other than the elevator manufacturer/installer.

1- Section 01 50 00 – Temporary Facilities and Controls: protection of floor openings and personnel barriers; temporary power and lighting.

2- Section 03 30 00 – Cast-In-Place Concrete: elevator pit and elevator machine foundation.

3- Section 04 20 00 – Unit Masonry: masonry hoistway enclosure, building-in and grouting hoistway doorframes, and grouting of sills.

4- Section 05 50 00 – Metal Fabrications: pit ladder, divider beams, supports for entrances and rails, and hoisting beam at top of elevator hoistway.

5- Section 07 16 00 – Cementitious Waterproofing: waterproofing of elevator pit.

6- Section 23 50 00 – Heat Generation Equipment: ventilation and temperature control of elevator equipment areas.

7- Section 26 05 00 – Common Work Results for Electrical:

8- Main disconnects for each elevator.

9- Electrical power for elevator installation and testing.

10- Disconnecting device to elevator equipment prior to activation of sprinkler system.

11- The installation of dedicated GFCI receptacles in the pit and overhead.

12- Lighting in controller area, machine area and pit.

13- Wiring for telephone/Internet service to controller.

14- Section 26 30 00 – Emergency (Standby) Power Supply Systems: emergency generator for elevator operation.

15- Section 27 30 00 – Voice Communications: ADAAG-required emergency communications equipment.

16- Section 28 31 00 – Fire Alarm Systems: fire and smoke detectors at required locations and interconnecting devices; fire alarm signal lines to contacts in the machine area.

17- Section 31 10 00 – Site Clearing: excavation for elevator pit.

1.03 References

1- Comply with applicable building and elevator codes at the project site, including but not limited to the following:

2- ASME A17.1/CSA B44, Safety Code for Elevators and Escalators.

3- ASME A17.7/CSA B44, Performance-Based Safety Code for Elevators and Escalators.

4- ADAAG, American Disabilities Act Accessibility Guidelines.

5- ANSI A117.1, Building and Facilities, Providing Accessibility and Usability for Physically Handicapped People.

6- ANSI/NFPA 70, (NEC) National Electrical Code.

7- CAN/CSA C22.1, (CEC) Canadian Electrical Code.

8- ANSI/UL 10B, Standard for Fire Test of Door Assemblies.

9- CAN/ULC-S104-10, Standard Method for Fire Test of Door Assemblies.

10- ANSI/NFPA 80, Standard for Fire Doors and Other Opening Protectives.

11- Building Codes IBC or NBCC.

12- All Local Jurisdictional applicable codes.

1.04 System Description for Car 2- Unit 1

A. Equipment Description: Gen3 Edge™ gearless with the controller located in a room

B. Equipment Control: Elevonic® Control System.

C. Drive: Regenerative

D. Quantity of Elevators: 1 of 1Elevator Stop Designations: 1, 2, 3, 4, 5

E. Stops: 5

F. Openings: In-Line

G. Travel: 60 ft 8 in 0

H. Rated Capacity: 2100 lbs. (953 kg)

I. Rated Speed: 350 fpm (1.78 mps)

J. Platform Size: 5’-9 1/2” W x 4’-11 1/8” D

K. Clear Inside Dimensions: 5 ft 8 in 5/16 wide, 4 ft 3 in 9/16 deep

L. Cab Height: 7’-9” (2362 mm)

M. Clear Cab Height: 7’-8 11/16” (2354 mm)

N. Entrance Type and Width: Single-Slide Door- 36” (914 mm)

O. Entrance Height: 7’-0” (2134 mm)

P. Main Power Supply: 208 volts ± 5% of normal, three-phase, with a separate equipment grounding conductor.

Q. Car Lighting Power Supply: 120 volts, single-phase, 15 amps, 60 Hz.

R. Machine Location: Machine room-less, with machine at the top of the hoistway

S. Signal Fixtures: Manufacturer's standard with metal button targets.

T. Controller Location: Controller located in a room

U. Performance:

1- Car Speed: ± 3 % of contract speed under any loading condition or direction of travel.

2- Car Capacity: Safely lower, stop and hold up to 120% of rated load (code required).

3- Ride Quality:

a. Vertical Vibration (maximum): 20 milli-g

b. Horizontal Vibration (maximum): 12 milli-g

c. Vertical Jerk (maximum): 4.59 ± 1.0 ft./ sec^3 (1.4 ± 0.3 m/ sec^3)

d. Acceleration/Deceleration (maximum): 2.62 ft./ sec^2 (0.8 m/ sec^2)

e. In Car Noise: 55 – 60 dB(A)

f. Stopping Accuracy: ± 0.375 in. (± 10 mm) max, ± 0.25 in. (± 6 mm) Typical

g. Re-leveling Distance: ± 0.5 in. (± 12 mm)

V. Operation: **Duplex Collective (Tie in with car 1 to form a duplex)**: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

W. Operation Features

1- Full Collective Operation
2- Anti-nuisance
3- Fan and Light Protection
4- Load Weighing Bypass
5- Independent Service
6- Firefighters' Service Phase I and Phase II
7- Top of Car Inspection
8- Zoned Access at Bottom Landing
9- Zoned Access at Upper Landing
10- Car Secure Access
11- Provision for Card Reader in Car (Card Reader provided and Installed by others).
12- Automatic Rescue Operation.

X. Door Control Features:

1- Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

2- Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.

3- Door protection shall consist of a two dimensional or three dimensional (as required by code), multi-beam array projecting across the car door opening.

4- Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

Y. Seismic conditions do not exist.

1.05 Submittals

A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:

1- Signal and operating fixtures, operating panels and indicators.

2- Cab design, dimensions, and layout.

3- Hoistway-door and frame details.

4- Electrical characteristics and connection requirements.

5- Expected heat dissipation of elevator equipment in hoistway (BTU).

6- Color selection chart for Cab and Entrances.

B. Shop Drawings: Submit approval layout drawings. Include the following:

1- Car, guide rails, buffers, and other components in hoistway.

2- Maximum rail bracket spacing.

3- Maximum loads imposed on guide rails requiring load transfer to building structure.

4- Clearances and travel of car.

5- Clear inside hoistway and pit dimensions.

6- Location and sizes of access doors, hoistway entrances and frames.

C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.06 Quality Assurance

A. Manufacturer: Elevator manufacturer shall be ISO 9001 certified.

B. Manufacturer shall have a minimum of fifteen years of experience in the fabrication, installation and service of elevators.

C. Installer: Elevators shall be installed by the manufacturer.

D. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations of such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

1.07 Delivery, Storage, and Handling

A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

B. Should the storage area be off-site, and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage and redelivery to the job site shall not be at the expense of the elevator contractor.

1.08 Submittals

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1.11 Warranty

A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The warranty period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.12 Maintenance and Service

A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of 12 months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs, or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

B. The periodic lubrication of elevator components shall not be required, including sheaves, rails, belts, ropes, car and CWT guides, etc.

C. The elevator control system must:

1- Provide in the controller the necessary devices to run the elevator on inspection operation.

2- Provide on top of the car the necessary devices to run the elevator in inspection operation.

3- Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.

4- Provide in the event of a power outage, means from the controller to electrically lift, and control the elevator brake to safely bring the elevator to the nearest available landing.

5- Provide the means from the controller to reset the governor over speed switch and trip the governor.

6- Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.

7- (Optional) Provide the means from the controller to reset elevator earthquake operation.

D. Provide system capabilities to enable a remote expert to create a live, interactive connection with the elevator system to enable the following functions:

1- Remotely diagnose elevator issues with a remote team of experts

2- Remotely return an elevator to service

3- Provide real-time status updates via email

4- Remotely make changes to selected elevator functions including:

a. Control building traffic: Restrict floor access, remove car from group operation, shut down elevator, select up peak/down peak mode and activate independent service.

b. Conserve energy: Activate cab light energy save mode, activate fan energy save mode, shut down car(s).

c. Improve passenger experience: Extend door open times, change parking floor, activate auto car full, activate anti-nuisance, advance door opening, door nudging, extend specific floor extended opening time, release trapped passengers.

PART 2 - PRODUCTS

2.01 Manufacturer

A. Manufacturer: Design based upon Otis Elevator's Gen3™ machine room-less elevator system.

2.02 Design and Specifications

A. Provide Gen3™ traction passenger elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:

1- Controller located in an elevator equipment room.

2- An AC gearless machine using embedded permanent magnets mounted at the top of the hoistway.

3- Polyurethane Coated-Steel Belts for elevator hoisting purposes.

4- Regenerative drive that captures normally wasted energy and feeds clean power back into the building's power grid.

5- LED lighting standard in ceiling lights and elevator fixtures.

6- Sleep mode operation for LED ceiling lights and car fan.

B. Approved Installer: Otis Elevator Company

2.03 Equipment: Controller Components

A. Controller: A microcomputer-based control system shall be provided to perform all the functions of safe elevator operation. The system shall also perform car and group operational control.

1- All high voltage (110V or above) contact points inside the controller shall be protected from accidental contact when the controller doors are open.

2- Controller shall be separated into two distinct halves: Motor Drive side and Control side. High voltage motor power conductors shall be routed to be physically segregated from the rest of the controller.

3- Field conductor terminations points shall be segregated; high voltage (>30 volts DC and 110 VAC,) and low voltage (< 30 volts DC)

4- Controllers shall be designed and tested for Electromagnetic Interference (EMI) immunity according to the EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity"

5- Controller located inside an elevator equipment room.

6- Drive: A Variable Voltage Variable Frequency AC drive system shall be provided. The drive shall be set up for regeneration of AC power back to the building grid.

2.04 Equipment: Hoistway Components

A. Machine: AC gearless machine, with a synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.

B. Governor: The governor shall be a tension type car-mounted governor.

C. Buffers, Car, and Counterweight: Polyurethane type buffers shall be used for speeds of 150 and 200 feet per minute. Oil buffers shall be used for a speed of 350 feet per minute.

D. Hoistway Operating Devices:

1- Emergency stop switch in the pit.

2- Terminal stopping switches.

E. Positioning System: Consists of an encoder, reader box, and door zone vanes.

F. Guide Rails and Attachments: Guide rails shall be Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual-purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.

G. Coated-Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords and a flat profile on the running surface and the backside of the belt. The belts shall have an FT-1 rating as referenced by NFPA 13. All driving sheaves and deflector sheaves should have a crowned profile to ensure center tracking of the belts. A continuous 24/7 monitoring system using resistance based technology has to be installed to continuously monitor the integrity of the coated-steel belts and provide advanced notice of belt wear.

H. Governor Rope: The Governor rope shall be steel and shall consist of at least eight strands wound about a sisal core center.

I. Fascia: Galvanized sheet steel shall be provided at the front of the hoistway.

J. Hoistway Entrances:

1- Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.

2- Sills Shall Be: Extruded Aluminum Sills at: 1, 2, 3, 4, 5

3- Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.

4- Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour

5- Frame and Entrance Finishes:

Brushed Stainless Steel Frames and Entrances at: 1, 2, 3, 4, 5

6- Entrance Marking Plates: Entrance jambs shall be marked with 4” x 4” (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.

7- Sight Guards: Sight guards will be furnished with all doors painted to match with painted doors, painted black for stainless steel doors.

2.05 Equipment: Car Components

A. Car Frame and Safety: A car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosures. The car safety shall be integral to the car frame and shall be Type "B", flexible guide clamp type.

B. Cab:

Premium, Steel Shell Cab with raised laminate wall panels

Laminate to be selected from manufacturer's catalog of choices.
Brushed Stainless Steel finished base plate located at top and bottom.
Brushed Stainless Steel finished vertical trim pieces are optional.

C. Car Front Finish: Brushed Stainless Steel.

D. Car Door Finish: Brushed Stainless Steel.

E. Ceiling Type: Flat Ceiling with 4 LED Lights

F. Ceiling Finish: Brushed Steel Finish

G. Fan: A variable-speed 120 VAC fan will be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan. A variable speed fan will be available when Glass-back cab option is selected.

H. Handrail:

3/8" x 2" (9.5 mm x 51 mm) Flat Tubular Bars with Brushed Steel Finished handrails shall be provided on the side and rear walls

I. Threshold: Extruded Aluminum

J. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.

K. Guides: The car shall have 3" diameter roller guides at top and bottom and the counterweight shall have slide type guides at the top and the bottom. Optional counterweight guides available.

L. Platform: The car platform shall be constructed of metal. Load weighing device shall be mounted on the belts at the top of the hoistway.

M. The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.

N. Certificate frame: Provide a Certificate frame with a Brushed Stainless Steel finish.

O. (Optional) Otis cab UVC light purification device

P. (Optional) Otis cab air purifier

2.06 Equipment: Signal Devices and Fixtures

A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a Brushed Stainless Steel finish. (An optional Luxury Swing COP is available. A second COP is available)

1- A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings. The buttons shall be: Lexan 1/8" (3mm) projecting buttons, fully illuminated by a white LED.

2- The car operating panel shall be equipped with the following features:

a. Raised markings and Braille to the left-hand side of each push-button.

b. Car Position Indicator at the top of and integral to the car operating panel.

c. Door open and door close buttons.

d. Inspection key-switch.

e. Elevator Data Plate marked with elevator capacity and car number.

f. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.

g. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator. Car Position Indicator is at the top of and integral to the car operating panel.

h. In car stop switch (toggle or key unless local code prohibits use)

i. Firefighter's hat

j. Firefighter's Phase II Key-switch

k. Call Cancel Button

l. Firefighter's Phase II Emergency In-Car Operating Instructions: worded according to A17.1 2000, Article 2.27.7.2. - Optional

m. Please Exit Symbol: provided with emergency hospital service, Seismic Zones ≥2 or express priority in the hall. - Optional

B. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. All Hall fixtures shall have a Brushed Stainless Steel Finish.

1- Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face or the

wall. Buttons shall be in vertically mounted fixture. Fixture shall be Brushed Stainless Steel finish.

2- Hall Buttons:

Flat Flush Mounted Brushed Stainless Steel button with blue or white LED illuminating halo

C. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound.

Hall Position Indicators at: 1

D. Access key-switch at top floor in entrance jamb.

E. Access key-switch at lowest floor in entrance jamb.

F. Card Reader Provision: Card Reader Provided

PART 3 - EXECUTION

3.01 Preparation

A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 Installation

A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.03 Demonstration

A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

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SECTION 22 0000

PLUMBING

PART I -- GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

B. Bidders shall utilize a complete set of Bidding Documents in preparing of Bid including Drawings and Specifications. The Engineer assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

C. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 DEFINITIONS

A. As used in the drawings and specifications for plumbing work, certain non-technical words shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions of other documents governing the plumbing work.

B. As used in this section, “provide” means “furnish and install”, and “POS” means “Provided under Other Sections”.

C. "Approved Equal" means any equipment or material which is approved by the engineer, and equal in quality, durability, appearance, strength, design and performance to the equipment or material originally specified.

D. "Alternate" means an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

E. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

F. "Concealed" means hidden in chases, furred spaces, walls, above ceilings or enclosed in construction.

G. "Contractor and/or Subcontractor" specifically means, the Plumbing Subcontractor working under this Section of the Specification.

H. "Exposed" means visible, in sight, or not installed "concealed" as defined above.

I. “Furnish” or “Provide” means:

1. Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the plumbing work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased item(s) are free of all liens, claims, or encumbrances.

2. To supply, erect, install and connect in complete readiness for operation, the particular work referred to, unless otherwise specified.

J. “Install” means: Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the plumbing work.

K. "May" means: A permissive term.

L. “New” means: Manufactured within the past two (2) years and never before used.

M. "Piping" means all piping including fittings, joints, hangers, supports and valves.

N. “Provide” means: “Furnish” and “Install”.

O. "Shall" means: A mandatory term.

P. "Underground or Below Slab" means piping that is buried exterior to or within the building.

Q. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any plumbing item in the drawings or specifications for plumbing work carries with it the instruction to furnish, install and connect the item as part of the plumbing work, regardless of whether or not this instruction is explicitly stated.

R. It shall be understood that the specifications and drawings for plumbing work are complimentary and are to be taken together for a complete interpretation of the plumbing work except those indications on the drawings, which refer to an individual element of work, take precedence over the specifications where they conflict with same.

1.3 SUMMARY

A. This section addresses materials and methods common to more than one Subcontractor. Refer to the drawings to determine the extent of work required of each individual trade.

1.4 DESCRIPTION OF WORK

A. The work described herein shall be interpreted as work to be done by the Plumbing Subcontractor. Work to be performed by other trades will be specifically referenced to a particular Contractor or Subcontractor.

B. The work under this section shall consist of furnishing all labor, materials, equipment, supervision, transportation, construction, facilities, devices, and incidentals necessary to provide complete plumbing systems as hereinafter described and as indicated on the drawings, including, but not limited to the following:

1. Elevator sump pump system.
2. Primary stormwater drainage system.
3. Coordination drawings.
4. Electrical power 24 volt power wiring.

1.5 RELATED WORK IN OTHER SECTIONS

A. The following work is not included as work in this Section and is to be performed under other Sections:

1. Fire Protection
2. Heating, Ventilating and Air Conditioning
3. Electrical
4. Excavation and Backfilling
5. Foundations and Trenching
6. Cast in Place Concrete
7. Temporary Light and Power
8. Flashing and Caulking
9. All Cutting and Patching
10. Painting
11. Electrical power 120 volt and above by electrical contractor.

1.6 CODES, ORDINANCES, AND PERMITS

A. All materials and workmanship shall comply with the latest editions of all applicable Codes, Local and State Ordinances, Industry Standards, and Regulations.

B. Where the contract documents indicate more stringent requirements than the following codes and ordinances, the contract documents shall take precedence.

C. In the event of a conflict with Codes, the most stringent requirements shall apply.

D. The Plumbing Subcontractor shall notify the Architect/Engineer of any discrepancies between the Contract Documents and applicable Codes, Standards, etc.

E. File all documents, pay all fees, and secure all permits, inspections, and approvals necessary for the work of this section.

F. Include in the work, without extra cost to the Owner, any labor, materials, services, apparatus, drawings, in addition to contract drawings and documents in order to comply with all applicable local ordinances and regulations, whether or not shown on drawings and/or specified.

G. The following Codes, Standards and References shall be utilized as applicable:

1. Rhode Island Building Code SBC-1-2021
   Incorporates 2018 International Building Code
2. Rhode Island Plumbing Code SBC-3-2021
   Incorporates 2018 International Plumbing Code
3. 2018 Rhode Island Fire Safety Code
4. Rules and Regulations of the Narragansett Bay Commission
5. Local Ordinances, Board of Health requirements and Regulations.
6. American National Standards Institute (ANSI).
7. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
8. American Society of Mechanical Engineers (ASME).
9. American Society of Testing Materials (ASTM).
10. American Welding Society (AWS).
11. Cast Iron Soil Pipe Institute (CISPI)
12. Commercial Standards, U.S. Department of Commerce (CS).
13. Department of Environmental Protection (DEP).
14. Environmental Protection Agency (EPA).
15. Factory Mutual (FM).
16. Industrial Risk Insurers (IRI).
17. Insurance Services Organization (ISO).
18. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS).
19. National Electric Code (NEC).
20. National Electrical Manufacturers Association (NEMA).
21. National Fire Protection Association (NFPA).
22. Occupational Safety and Health Administration (OSHA)
23. Owner's Insurance Company Requirements.

24. State Department of Public Safety.
25. Underwriters' Laboratories, Inc. (UL).

1.7 CONTRACT DRAWINGS AND SPECIFICATIONS

A. The Contract Drawings are generally diagrammatic and convey the Scope of Work and General Arrangement of apparatus and equipment. The locations of all items shown on the drawings or called for in the specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect and Engineer before being installed. The Subcontractor shall follow drawings in laying out work and shall check drawings of the other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. If directed by the General Contractor, Engineer and/or Architect, the Subcontractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or before proper execution of the work.

B. Specifications: The specifications are intended only to complement the drawings; however, work detailed and/or noted only on the drawings or work described only in the specifications shall all be considered as part of the scope of work.

1.8 OBTAINING INFORMATION

A. Obtain from the manufacturer the proper method of installation and connection of the equipment that is to be furnished and installed. Obtain all information that is necessary to facilitate the work and to complete the project.

1.9 COOPERATION AND COORDINATION WITH OTHER TRADES

A. The Contract Drawings are diagrammatic only intending to indicate general routing and location of piping and equipment. The Drawings are not intended to show every offset and accessory required, nor every structural difficulty that may be encountered.

B. Where requirements of the applicable codes, plans and/or specifications are in conflict, the most stringent requirement will be included in the Contract. Prior to ordering and/or installing any portion of the work which appears to be in conflict, the work shall be brought to the Architect/Engineer's attention for direction as to what is provided.

C. Final location of plumbing fixtures and other pieces of equipment, whether or not furnished by the Plumbing Subcontractor, requiring plumbing services shall be coordinated with the Architectural Plans. Additional offsets, fittings, etc., shall be provided as needed to meet this requirement at no extra cost to the Owner.

D. If discrepancies exist in the scope of work as to what trade provides items, they shall be reported to the Architect/Engineer prior to signing the Contract. If the discrepancies are not reported, the Plumbing Subcontractor shall furnish such items as needed for a complete and operable system.

E. All work shall be installed in cooperation with other trades.

F. Keep fully informed as to the shape, size and position of all openings required for all apparatus and give information in advance to build openings into the work. Furnish and set in place all sleeves, pockets, supports and incidentals.

G. All distribution systems which require pitch or slope such as plumbing drains, steam and condensate piping shall have the right of way over those which do not. Confer with other trades as to the location of pipes, ducts, lights, and apparatus and install work to avoid interferences.

H. Prepare and submit for review, coordinated Plans and sections, clearly showing how the work is to be installed in relation to the work of other trades. Work that is installed before coordination with other trades, or that causes interference with the work of other trades shall be changed to correct condition.

I. The Plumbing Contractor shall pay for all permits, inspections, labor, material, and fees associated with the various Utility Companies coordination requirements mentioned in this section and for this Contractor's work under this project.

J. HVAC, Plumbing, Fire Protection, and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structural and other trades and to meet Architectural requirements.

K. In all spaces, prior to installation of visible material and equipment, including access panels, review Architectural Drawings for exact locations and where not definitely indicated, request information from Architect. Where the plumbing work shall interfere with the work of other trades, assist in working out the space conditions to make satisfactory adjustments before installation. Without extra cost to the Owners, make reasonable modifications to the work as required by normal structural interferences. Pay the General Contractor for additional openings or relocating and/or enlarging existing openings through concrete floors, walls, beams, and roof required for any work which was not properly coordinated. Maintain maximum headroom at all locations. All piping, duct, conduit, and associated components to be as tight to underside of structure as possible.

L. If any plumbing work has been installed before coordination with other trades so as to cause interference with the work of such trades, all necessary adjustments and corrections shall be made by the trades involved without extra cost to the Owners.

M. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Architect and Engineer for review and approval.

1.10 UTILITY COMPANY COORDINATION

A. This section includes, but is not limited to coordination with the following utilities, agencies and authorities having jurisdiction:

1. Plumbing Inspector: Review plans and specifications with the local plumbing inspector. Obtain and pay for all permits.

2. Building Inspector: Review plans and specifications with the local building inspector, if not done so by the General Contractor.

1.11 BIDDER'S REPRESENTATION

A. By the act of submitting a bid for the proposed contract, the Bidder represents that:

1. The Bidder and all subcontractors have carefully and thoroughly reviewed the drawings, specifications and other construction contract documents and have found them complete and free from ambiguities and sufficient for the purpose intended; further that.

2. The Bidder intends to use are licensed, skilled and experienced in the type of construction represented by the construction contract documents bid upon; further that.

3. Neither the Bidder nor any of the Bidder's employees, agents, intended suppliers or subcontractors have relied upon any verbal representations, allegedly authorized or unauthorized from the Owner, or the Owner's employees or agents including architects, engineers, or consultants, in assembling the bid figure; and further that

4. The bid figure is based solely upon the construction contract documents and properly issued written addenda and not upon any other written representation.

1.12 SHOP DRAWINGS

A. Within thirty (30) days after the date of notice to proceed, and before purchasing any materials or equipment, submit for approval a complete itemized list, in six (6) copies, of all materials, equipment and of Subcontractors to be incorporated under this Section.

B. After approval of the list, submit for review a minimum of eight (8) sets of detailed shop drawings. All shop drawings for equipment submitted for review shall include complete Specifications, including type of materials, operating pressures and temperatures, capacities, performance, and power requirements to determine compliance with Contract Documents. All data submitted shall be complete for all equipment and shall apply only to this specific project.

C. All shop drawing submittals shall be complete and include all Part 2 – Products of this specification and be clearly identified. No consideration will be given to partial submittals, except with prior approval.

D. Facsimiles of any type will not be accepted.

E. A written letter from the Plumbing Contractor stating all piping systems above and below ground specified herein have been tested, flushed, and approved by the Local Plumbing Inspector.

F. Engineering Design Service's reserves the right to request additional submittals on any item not specified herein under this section.

G. The approval of the equipment does not relieve the Subcontractor of responsibility of shop drawing errors related to details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the Specifications, and/or job conditions as they exist.

H. Refer to General Requirements for the substitutions of equipment and submittal of shop drawings. If apparatus or materials are substituted for those specified, and such substitution necessitates changes in, or additional connections, piping, supports, or construction, same shall be provided. Plumbing Subcontractor to assume cost and entire responsibility thereof.

I. Regardless of any information included in the shop drawing submitted for review, the requirements of the Drawings and Specifications shall not be superseded in any way by the shop drawing review.

J. Each submittal shall be reviewed, stamped, and certified prior to submission to the Architect. Such certification shall be made by the Owner, or Corporate Officer of the Contractor, or by a person duly authorized by the Owner to sign binding agreements for the Contractor. The certification shall state that data and details contained on each shop drawing, layout drawing, catalog data and brochure has been reviewed by the Contractor and that it complies with the Contract Documents in all respects. Shop drawings, layout drawings, catalog data and brochures will not be reviewed and will be returned to the Contractor unchecked unless they are certified.

K. It is intended that the Contractor submit complete and accurate data at the first submission. If the shop drawing is returned marked “Does not Conform”, or “Resubmit for Final Review”, only one (1) additional submission will be permitted.

L. Equipment shall be of proper size for its allotted space. Equipment shall be disassembled as required, without invalidating the manufacturer’s warranty, so that it can be installed through regular window, door, and/or louver openings.

M. The shop drawings and manufacturer’s data shall be submitted in a timely manner sufficiently in advance to give ample time for checking, correcting, resubmitting, and rechecking if necessary. No claim for delay will be granted for failure to comply with this requirement.

N. A minimum period of two (2) weeks, exclusive of transmittal time, will be required in the Engineer’s office each time shop drawings, layout drawings and catalog data and brochures are submitted or resubmitted for review. This time period shall be considered by the Contractor when scheduling his work.

1.13 RECORD DRAWINGS

A. All costs related to the following requirements shall be paid for by this Subcontractor.

B. Purchase and maintain at the job site a complete and separate black line set of prints of the Contract Drawings on which accurately indicate daily progress by coloring materials and

apparatus as installed. Schedules shall be modified to reflect data consistent with that of the installed equipment. Clearly show all changes to the work as a result of change orders, instructions issued by the Architect or conditions encountered in the field. Accurately indicate the location, size, type and elevation of new utilities and their relationship to existing utilities.

C. The marked up and colored in prints will be used as a guide for determining the progress of the work installed. They shall be inspected weekly and shall be corrected immediately if found inaccurate or incomplete. Requisitions for payment will not be approved until the Drawings are accurate and up-to-date.

D. At the completion of the work, submit one (1) set of marked up prints for review and comment. After review and comment, these marked up prints shall be used in the preparation of the Record Drawings. The Record Drawings shall consist of these prints (corrected) previously indicated, as well as two (2) CAD disks of the Final Coordination Drawings, corrected on the basis of the Architect/Engineer's final comments.

E. Obtain and pay for one (1) set of reproducible mylars and CAD disks (AutoCAD Release 2000 minimum or compatible system) applicable to this Section. Make all modifications to these reproducibles as shown on the marked up prints. Remove all superseded data to show the completed installation.

F. The Record Drawings may be made from the originals of the Contract Drawings. Arrange with the Architect to have these reproducibles made from the originals.

G. Deliver the completed reproducible Record Drawings and CAD disks properly titled and dated to the Architect. These Record Drawings shall become the property of the Owner.

1.14 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Operating Instructions: Provide operating instructions to the Owner's designated representative with respect to the operation functions and maintenance procedures for all equipment and systems installed. The cost of such instructions, up to one full day of the Contractor's time, shall be included in the contract price. The cost of providing a manufacturer's representative at the site for instructional purposes shall be included in the Contract Price. Included shall be a letter with two (2) copies containing the name of the person or persons to whom the instructions were given, and the dates of the instruction period shall be submitted to the Architect at the completion of the project.

B. Maintenance Manuals: At the completion of the project, turn over to the General Contractor four (4) complete manuals in 3-ring binders containing only that information which specifically applies to this project and all unrelated material shall be deleted, indexed, containing the following:

1. Complete shop drawings of all material and equipment in Part 2 of this section.
2. Operation descriptions of all systems.
3. Provide name, address and telephone number of the manufacturer's representative and service company for each piece of equipment so that the source of replacement parts and service for each item of equipment can be readily obtainable.
4. Preventative maintenance instructions for all systems.
5. Spare parts list of all system components.
6. Copies of all valve charts.
7. During the instruction period this manual shall be used and explained.

1.15 GUARANTEE

A. This Contractor shall obtain in the General Contractor's and Owner's name, the standard written manufacturer's guarantee of all materials furnished under this Section where such

guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents. The guarantee shall be for a period of one (1) year minimum from the date of acceptance or final payment.

B. Any failure due to defective material, equipment or workmanship which may develop shall be corrected at no expense to the Owner, including all damage to areas, materials and other systems resulting from such failures.

C. Upon receipt of notice from the Owner of failure of any part of the systems during the guarantee period, the affected parts shall be replaced. Any equipment requiring excessive service shall be considered defective and shall be replaced.

1.16 STORAGE OF MATERIALS

A. Store materials prior to their installation where designated by the General Contractor. This Contractor shall be responsible for all materials stored and protect all installed equipment from injury or defacement.

1.17 PROTECTION OF WORK AND PROPERTY

A. Be responsible for the care and protection of all work included under this Section until it has been tested and accepted.

B. Protect all equipment and materials from damage from all causes including theft. All materials and equipment damaged or stolen shall be repaired or replaced with equal material or equipment.

C. Protect all equipment, outlets, and openings with temporary plugs, caps and covers. Protect work and materials of other trades from damage that might be caused by work or workmen and make good damage thus caused.

D. When open flame or spark producing tools, such as blow torches, welding equipment, etc., are required in the process of executing the work, the General Contractor will be notified not less than twenty-four (24) hours in advance of the time that the work is to begin and the location where the work is to be performed. Provide, where necessary, fire protective covering and maintain a constant non-working fire watch where work is being performed and until it is completed.

1.18 COOPERATION WITH OTHER TRADES

A. Give full cooperation to other trades and furnish in writing to the Architect any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

B. Coordination drawings shall be initiated under Section 23.00.00 of the Specifications. It is their responsibility for preparation of project coordination drawings showing the installation of all equipment, piping, ducts and accessories to be provided under Section 23.00.00 of the Specifications. These drawings shall be prepared at not less than 3/8 in. = 1 ft. scale, and shall show building room layouts, structural elements, ductwork, and lighting layouts of function. A reproducible copy of each drawing prepared shall then be submitted to each Contractor working under Sections 21.00.00, 22.00.00 and 26.00.00 who shall be responsible for coordinating his equipment and systems and shall show these on the drawings submitted. After this Contractor has fulfilled his obligation, he shall return the drawings to the HVAC Contractor. After each drawing has been coordinated between trades, each trade shall sign each drawing, indicating acceptance of the installation. The HVAC Contractor shall then print the coordination original and these prints submitted through the General Contractor to the architect for review and comment, similar to shop drawings. Comments made on these drawings shall result in a correction and re-submittal of the drawings.

C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop

details for the proper installation of work and for the purpose of coordinating adjacent work.

D. The Coordination Drawings shall be produced on AutoCAD Release 2006 minimum or compatible system. A disc and one (1) set of reproducible sepias (all-trade composite) shall be provided to the Architect/Engineer for review.

E. The cost of preparing and reproducing these Drawings will be included as part of this Contract.

F. Coordination Drawings shall not be construed as replacing any Shop Drawings.

G. The Plumbing Subcontractor shall be additionally responsible for preparing drawings indicating all the buried or underground plumbing systems. Include in these documents all other underground components such as, but not limited to, underslab drainage systems, foundation drainage systems, footings, foundation walls, pits, tie beams, electric and telephone duct banks.

1.19 SITE VISITATION

A. Prior to submitting bid, visit site and identify existing conditions and difficulties that will affect work of this section. Demolition work will require careful site examination prior to bidding. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers.

1.20 DEMOLITION

A. Prior to submitting bid, visit site and identify existing conditions and difficulties that will affect work of this section. Demolition work will require careful site examination prior to bidding. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers.

B. Prior to commencing demolition, contractor shall identify with owner any equipment to be returned to the owner after demolition. All other debris shall be disposed of by this contractor in accordance with all applicable regulations. Any shutdowns required for demolition shall be coordinated with building owner to avoid impact to operations.

C. During demolition, any equipment found to be abandoned shall be demolished. Existing unused connections to existing ducts or piping shall be capped accordingly. Abandoned elements built into walls or located above existing inaccessible ceilings shall remain and ends capped and marked abandoned.

D. During demolition, any piping found to be abandoned shall be removed in its entirety.

E. This contractor shall protect work against injury or damage and carefully store material and equipment to be relocated. Open ends of work shall be closed with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

1.21 ASBESTOS REMOVAL

A. Should this Subcontractor or any of its Sub-Subcontractors encounter any asbestos and/or asbestos related products or materials (the “asbestos materials”) during the performance of its work, this Subcontractor shall stop work immediately and so inform the General Contractor and the Owner of the presence of asbestos.

1.22 CONTINUITY OF SERVICE AND SCHEDULING OF WORK

A. Continuity of all services shall be maintained in all areas which will be occupied during the construction period. When an interruption of service becomes necessary, such shall be made only upon consent of the Owner and at a time outside normal working hours as he shall designate.

B. Refer to the overall scheduling of the work of the project. Schedule work to conform to this schedule and install work to not delay nor interfere with the progress of the project.

1.23 ACCESSIBILITY

A. Assure and be responsible for the adequacy of shafts and chases, the adequate clearance in double partitions and hung ceilings for the proper installation of the work. Cooperate with all other trades whose work is in the same space. Such spaces and clearances shall, however, be kept to the minimum size required.

B. Locate all equipment, which must be serviced, operated, adjusted or maintained fully accessible positions. Equipment shall include, but not be limited to, valves, traps, cleanouts, motors, controllers, filters, dampers, starters, coils, fire dampers, smoke dampers and drain points. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be made to allow for better accessibility, and the engineer shall approve any change.

1.24 SUBSTANTIAL COMPLETION

A. When Subcontractor considers Work under this Section (or designated portion of Work) is substantially complete, submit written notice through the General Contractor with a list of items remaining to be completed or corrected.

B. Should Architect and/or his Engineer observe and find Work is not substantially complete, he will promptly notify Subcontractor through the General Contractor in writing, listing observed deficiencies.

C. Subcontractor shall remedy deficiencies and send a second written notice of substantial completion.

D. When Architect and/or his Engineer finds work is substantially complete he will prepare a Certificate of Substantial Completion in accordance with provisions of General Conditions.

1.25 FINAL COMPLETION

A. When Subcontractor considers Work under this Section is complete, submit through the General Contractor written certification that:

1. Contract documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected.
4. Equipment and systems have been tested, adjusted, and balanced and are fully operational.
5. Operation of systems has been demonstrated to Owner’s personnel.
6. Work is complete and ready for Architect’s and/or his Engineer’s final review.
7. Should Architect and/or his Engineer observe and find work incomplete, he will promptly suspend his review and notify Subcontractor in writing through the General Contractor.
8. Subcontractor shall complete his work, remedy deficiencies, and send a second certification of final completion.
9. Architect and/or his Engineer shall, upon receipt of a second certification of completion, make a second review and shall notify the Subcontractor in writing through the General Contractor listing observed deficiencies.
10. When Architect and/or his Engineer finds work complete, he will consider close out submittals.

1.26 REOBSERVATION

A. Should status of completion of Work require additional services by Architect and/or his

Engineer due to failure of Work to conform with Subcontractor's claims on initial Architect and/or Engineer's review for Substantial Completion or for Final Completion, Owner will deduct the amount of Architect and/or his Engineer's compensation for additional services from final payment to Subcontractor.

1.27 CERTIFICATES OF APPROVAL

A. Upon completion of all work, furnish in duplicate certificates of inspections from all inspectors and authorities having jurisdiction, notarized letters from the manufacturers stating that authorized factory engineers have inspected and tested the operation of their respective equipment and found same to be in satisfactory operating condition.

1.28 INSPECTION AND TEST

A. If inspection of materials and/or equipment installed shows defects, such defective materials and/or equipment shall be replaced at no cost to the General Contractor or Owner, and the inspection and tests repeated.

B. Make all reasonable tests as required and prove the integrity of all work and leave the entire installation in correct adjustment and ready to operate.

1.29 MATERIALS AND EQUIPMENT STANDARDS

A. Where materials or equipment are specified by patent proprietary name or name of the manufacturer, such specification shall be deemed to be used for the purpose of establishing a standard for that particular item. No equipment or material shall be used unless previously approved by the Architect.

B. Substitutions may be offered for review provided the material, equipment or process offered for consideration is equal in every respect to that indicated or specified and only if the term "approved equal" appears. The request for each substitution must be accompanied by complete specifications together with drawings or samples to properly appraise the materials, equipment, or process.

C. If a substitution of materials or equipment in whole or in part is made, the Contractor shall bear the cost of any changes necessitated by any other trade as a result of said substitution.

D. Manufacturer's directions shall be followed in the delivery, storage and installation of any equipment. Notify the Architect/Engineer, in writing, of any conflict between the Contract Drawings and the manufacturer's requirements and obtain a written response prior to proceeding with work. Should the Subcontractor fail to comply with this, he/she shall bear the costs of any corrections which may be required.

E. The Subcontractor shall furnish and install all equipment, accessories, connections, and incidentals to complete the work under this Section.

1.30 EQUIPMENT DEVIATIONS

A. Where proposals to use an item of equipment other than that specified which requires any redesign of the structure, partitions, foundations, piping, wiring or any other part of the fire protection, plumbing, mechanical, electrical, or architectural layout, all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Architect at the Contractor's expense.

B. Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the drawings, furnish, and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.31 SCAFFOLDING, RIGGING AND HOISTING

A. Provide scaffolding, rigging, hoisting and services necessary for delivery, erection and

installation of material, equipment and apparatus furnished under this division. Remove same from premises upon completion of work.

B. Coordinate propose routing with architect prior to rigging and protect all existing building components against damage.

1.32 CONFLICT BETWEEN PLANS AND SPECIFICATIONS

A. In case of conflict between the contract drawings and specifications, the Engineer shall determine which takes precedence.

PART 2 -- PRODUCTS

2.1 PLUMBING PIPE AND FITTINGS

A. Pipe and fittings shall be of US manufacture and shall conform to the latest ANSI, ASTM, AWWA and NFPA Standards including latest amendments.

B. Each length of pipe, each pipe fitting, trap, material, and/or device used in the respective system shall have cast, stamped, or indelibly marked on it, the maker's name or mark, weight, and quality of the product when such marking is required by the approved standard that applies.

C. Type A:
PVC Schedule 40 solid wall pipe and PVC drainage fittings joined by solvent welding.
This system is intended for use in non-pressure applications where the operating temperature will not exceed 140° F.
PVC cellular core pipe and PVC drainage fittings joined by solvent welding will not be approved as an equal.

D. Type B:
Type K hard drawn copper tubing with brazed wrought copper, listed or approved fittings made especially for brazed connections.

E. Joints between different piping materials shall be made with a mechanical joint or dielectric fitting.

F. Pipe and fittings shall be in accordance with the following:

1. Primary Storm Conductor Within the Building	Type A
2. Elevator Waste Pump Discharge Pressure Portion Within Elevator Shaft	Type B
3. Elevator Waste Pump Discharge Pressure Portion Within Building	Type B

2.2 INSULATION

A. Insulation shall be Owens Corning Insulating Systems

B. General:

1. Products shall not contain asbestos, lead, mercury, or mercury compounds.
2. Owens Corning pipe insulation is not known to contain penta-, octa, or deca-brominated diphenyl flame retardant substances, such as deca-Bromine (deca-BDE).
3. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C795.

C. Certifications:

1. Only Owens Corning SSL II with ASJ Max and VaporWick pipe products are GREENGUARD Indoor Air Quality Certified and GREENGUARD Gold Certified.
2. Owens Corning pipe products are certified by SCS Global Services to contain a minimum of 53% recycled glass content, 31% pre-consumer and 22% post-consumer (except

Flexwrap Insulation).

3. Owens Corning pipe products are UL listed and labeled (except Flexwrap Insulation and Pipe and Tank Insulation).
4. No Wrap FIBERGLAS Pipe Insulation and Jacketed FIBERGLAS Pipe Insulation (ASJ Max, VaporWick, Evolution, ASJ) have received the Cradle to Cradle Products Innovation Institute's Bronze Level Material Health Certificate.
5. These products Environmental Product Declaration (EPD) has been certified by UL Environment.
6. Molded Fibrous Glass Pipe Insulation: Comply with ASTM C547, Type I, Grade A; and Type IV, Grade B; and ASTM C585, for sizes required and of a type suitable for installation on piping systems as required. One of the following types shall be used:
    a. For indoor systems operating at temperatures from 0°F (-18°C) to +1000°F (538°C) with heat-up schedule:
        I. Owens Corning® SSL II® with ASJ Max FIBERGLAS Pipe Insulation.
    b. For systems operating at temperatures up to +850°F (232°C), no heat up-schedule required.
    c. For systems operating at temperatures to +1000°F (538°C) with heat-up schedule and always above the ambient temperature:
        I. Owens Corning No Wrap Pipe Insulation.
7. For systems operating below ambient (32°F (0°C) to +65°F (18°C)) temperature:
    a. Owens Corning VaporWick® Pipe Insulation. (see Plumbing Pipe Insulation – VaporWick® Pipe Insulation)
8. Perpendicular Oriented Mineral Fiber Insulation: ASTM C1393, Type IIIB, Category 2:
    a. For piping equal to or larger than 10 in (250 mm) diameter operating at temperatures up to +850°F (454°C):
        I. Owens Corning Flexwrap FIBERGLAS Insulation.
9. Perpendicular Oriented Mineral Fiber Insulation: ASTM C1393, Type II, Category 1:
    a. For piping equal to or larger than 10 in (250 mm) diameter operating at temperatures up to +650°F (343°C):
    b. Owens Corning® FIBERGLAS Pipe and Tank Insulation.
10. Provide accessories per insulating system manufacturer’s recommendations, including the following:
    a. Closure Materials: Butt strips, bands, wires, staples, mastics, adhesives, and pressure-sensitive tapes. a. Mold resistant mastics are recommended for chilled water applications.
    b. Field-Applied Jacketing Materials: Sheet metal, plastic, canvas, fiberglass cloth, insulating cement, PVC fitting covers.
    c. Support Materials: Hanger straps, hanger rods, saddles, support rings, and high density inserts.
    d. Adhesives For Indoor Applications: VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
11. Insulation shall be in accordance with the following schedule:

System	Insulation Thickness

Horizontal Primary Storm Conductor	1/2” up to 6” diameter 1” above 6” diameter

2.3 HANGERS AND SUPPORT

A. Pipe hangers, pipe anchors, auxiliary steel, wood blocking and fixture supports shall be furnished and set by this Contractor, and he shall be responsible for their proper and permanent location. This Contractor shall be responsible for all core drilling.

B. All piping shall be rigidly supported from the building structure by means of approved hangers and supports. The hanging and support of all piping systems shall conform to the ANSI/MSS-SP.58 AND MSS-SP 69 latest edition. This Contractor shall furnish and install all required auxiliary steel required for hanging of piping.

C. All horizontal piping shall be hung with approved adjustable malleable iron pipe hangers.

1. Copper tubing 1-1/2 inch and larger shall be supported at ten (10) foot intervals. Copper tubing 1-1/4 inch and smaller shall be supported at six (6) foot intervals.

2. Plastic piping shall be supported at 3 foot intervals for 1-1/4 inch piping and at 4 foot intervals for 1 1/2 inch piping and larger.

D. Interior hangers for piping sizes four (4) inches and smaller shall be Carpenter & Paterson, No. 1A band type, Grinnell Company, Calco Steel Products Company, or equal, black steel with hanger rods with machine threads. Hangers for piping larger than four (4) inches shall be the adjustable clevis hanger type, malleable iron with extension rod. Chain, strap, perforated bar or wire hangers will not be approved. Where used for uninsulated copper tubing, all hangers shall be copper plated and chrome plated for chrome plated piping. Insulation shields shall be provided on all horizontal insulated piping at each hanger or support location. Insulation shields shall be galvanized steel, 180 degrees arc and centered on the hanger or support. On diameters 4 inches and smaller, shield shall be 12-inch long, 18 gauge steel. On diameters 5 inches and 6 inches, shield shall be 18-inch long, 16 gauge steel. On diameters 8 inches and 10 inches, shield shall be 24-inch long, 14 gauge steel. On diameters greater than 10 inches, shield shall be 24-inch long, 12 gauge steel. Structure attachments shall be as manufactured by Carpenter & Patterson and shall be suitable to carry the weight.

E. Approved gang hangers may be used in lieu of separate hangers on pipes running parallel to each other and close together.

F. Wherever wood blocking is required to insure adequate support of fixtures and related piping, it shall be provided by this Contractor and it shall be fire treated.

G. All inserts in new concrete construction shall be capable of developing the full strength of the rod or bolt used in them and shall be either continuous insert type or malleable iron concrete inserts for rod sizes 3/8 inch to 7/8 inch. Continuous inserts shall have anchors every 4 inches and shall extend 1-1/2 inches above the back of the insert and shall hook to provide anchor. All inserts shall be tied to the reinforcing steel rods with wire and properly sized reinforcing rods shall be inserted through the special holes, hooks or brackets provided in or on the inserts to securely anchor insert to the structure.

H. Seismic Restraints: It is the intent of this seismic specification to keep all mechanical building system components in place during a seismic event.

1. All mechanical systems must be installed in strict accordance with seismic codes, component manufacturer's and building construction standards. Whenever a conflict occurs between the manufacturer's or construction standards, the most stringent shall apply.

2. This contractor shall engage a professional structural engineer registered in the jurisdiction of this project to review the entire installation to determine all seismic restraint requirements and methods. Contractor shall submit a report outlining the structural engineer’s review as

well as seismic restraint shop drawings and supporting calculations prepared by the professional structural engineer for review by the Architect.

3. Seismic restraints shall be designed in accordance with seismic force levels as detailed in the applicable building code.

2.4 SLEEVES, ESCUTCHEONS AND FIRESTOPPING

A. Sleeves shall be furnished and set by this Contractor and he shall be responsible for their proper and permanent location. This Contractor shall be responsible for all core drilling. Core openings shall have link-seal fire-rated penetration closures.

B. This Contractor shall provide steel sleeves at all points where pipes and all other work under his charge pass through masonry, concrete, or wood. Sleeves shall have flanges or wings at mind-points to prevent sleeve from slipping through the floor or wall. Pipe sleeves shall be sufficient diameter to provide approximately 1/4 inch clearance around the pipe or the insulation on insulated systems. Sleeves through walls shall end flush with the surface of the walls. Sleeves in floors shall extend one inch above the floor and after installation of piping shall be packed, firestopped and made watertight. Sleeves in exterior walls shall have waterstop plates, shall end flush with the surface of the walls, shall have link-seal penetration closures and shall be of a diameter that is compatible with the Link Seal System.

C. Seal the sleeve penetrations with firestopping and smoke stopping systems as manufactured by Dow Corning, Bio-Shield, Rectorseal Metacaulk, 3M, Fyre Putty or equal. Where pipes penetrate fire rated construction, the openings shall be packed with the material and system that shall maintain the integrity of the fire rating as detailed in the UL Fire Resistance Directory.

D. Firestop sealant shall be chemical compatible with the associated plastic pipe material and comply with the FBC System Compatible Program.

1. Note: Refer to architectural drawings for rated walls and partitions. Where there are no architectural drawings or they do not indicate rated walls and partitions, the following guidelines shall be used. All floors, corridor walls, party walls, mechanical room walls, duct and pipe chase walls, stairwells, trash room and chute walls shall be considered minimum two hour fire rated walls.

G. Pipe Sleeves shall be according to the following:

1. Sleeves on pipes passing through masonry or concrete construction shall be scheduled 40 galvanized steel pipe.

2. Sleeves on pipes passing through wood or drywall partitions shall be 16 gauge galvanized steel.

2.5 ELEVATOR SUMP PUMPS

A. Elevator pit sump pump shall be Stancor OM50-AOPP/120 effluent pump with oil sensor, float switch, control panel with alarm, 2” discharge, rated 3/4 hp, 120 v, 60 HZ, 3450 rpm, capacities of 50 GPM at 25' TDH, 50 feet cables et and high water level alarm.

2.6 PIPE IDENTIFICATION AND VALVE TAGS

A. All piping, except that piping, which is within inaccessible chases, shall be identified with semi-rigid plastic identification markers equal to Seton Setmark pipe markers. Direction of flow arrows are to be included on each marker. Each marker background shall be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the “Scheme for the Identification of Piping Systems” (ANSI/ASME A13.1-2007). Setmark snap-around markers shall be used for overall diameters up to six inches and strap-around markers shall be used above six inch overall diameters. Markers shall be located adjacent to each valve, at each branch, at each cap for future, at each riser take off, at each pipe passage through wall, at each pipe passage through floors, at each pipe passage to underground and on vertical and horizontal piping at 20 foot intervals maximum.

2.7 TESTS AND APPROVALS

A. Pipe lines shall be blown or flushed clean, before piping tests are applied. All plumbing work shall be tested as herein specified. No portion shall be covered, concealed, used, or made inaccessible to testing, inspection, repair, correction, or replacement until tests thereof have been satisfactorily completed in the presence of the Architect's Authorized Representatives. The Plumbing Subcontractor must accommodate his testing operations to the progress of the project as a whole. Correct all defects appearing under test and repeat the tests until all parts of the work have withstood them successfully.

B. Furnish all labor, material and services for testing, including testing plugs, pumps and compressors; he shall make and remove all temporary piping connections required for the tests and shall dispose of test water and all wastes after tests. Leave all work in good order, ready for full use.

C. Tests on all plumbing systems shall be made in accordance with the requirements of the Local Plumbing Code and the codes, standards, recommended practices, and manuals of the National Fire Protection Association.

PART 3 - EXECUTION

3.1 WORKMANSHIP

A. Prior to the work of this section, this Contractor must ascertain that preceding work has been accomplished in a manner to permit compliance with the level of quality required by this Section.

B. The entire work provided in this specification shall be constructed and finished in every respect in a workmanlike and substantial manner. It is not intended that the drawings shall show every pipe, fitting, and appliance. Furnish all parts as may be necessary to complete the system in accordance with the best trade practices and to the satisfaction of the Architect, Engineer, and General Contractor.

C. This Contractor shall keep other contractors fully informed as the shape, size and position of all openings required for his apparatus and shall give full information to the General Contractor or other contractors sufficiently in advance of the work so that all openings may be built in advance. Furnish and install all sleeves, supports, etc., specified or required.

D. In the case of failure on the part of this Subcontractor to give proper and timely information as noted above, he shall do his own cutting and patching or have same done by the General Contractor at this subcontractor's expense, but in any case, without extra expense to the Owner and General Contractor.

E. This Contractor shall obtain detailed information from the manufacturer of apparatus as to the proper method of installing and connecting same. He shall also obtain all information from the General Contractor and the other contractors which may be necessary to facilitate his work and the completion of the whole project.

3.2 TESTING PIPING SYSTEMS

A. Test all work in the presence of the Architect/Engineer and/or Owner, Owner's representative and Plumbing Inspector as called for in local codes.

B. After soil, waste and vent piping is in place and before being furred in, plug lower ends and fill. The system shall be left tight under these conditions and water level shall be maintained intact for a period of at least four hours.

C. This Contractor shall furnish all equipment, labor, and materials, required for these tests.

D. Any leaks in joints or evidence of defective pipe or fittings disclosed by tests shall be immediately corrected by replacing defective parts with new joints or corrected materials. No makeshift repairs effected by caulking threaded pipe with lead wool, application of wicking or

patented compounds being permitted. Perform smoke tests as required by local code or by the Architect/Engineer.

3.3 PROTECTION AND CLEANING

A. Each subcontractor shall be responsible for his work and equipment until finally inspected, tested, and accepted. Carefully store materials and equipment which are not immediately installed after delivery on site. Close open ends or work with temporary covers or plug during construction to prevent entry of obstructing materials.

B. Each subcontractor shall protect work and materials of other trades from damage that might be caused by his work or workman and make good damage thus caused.

C. The premises shall be kept reasonably clean at all times, and rubbish shall be removed as directed by the General Contractor.

D. Upon completion of this work, the Contractor shall clean all fixtures and equipment and replace damaged parts. Upon failure of this Contractor to fulfill his obligation, this work will be taken care of at his expense.

3.4 WORK COORDINATION AND JOB COORDINATION

A. Plumbing equipment shall not be installed in congested and possible problem areas without first coordinating the installation of same with the other trades and the General Contractor.

B. Particular attention shall be directed to the coordination of system with all equipment of other trades installed in and above the ceiling areas. Conflicts in heights and clearance above hung ceilings shall be brought to the attention of the General Contractor for a decision before equipment is installed.

C. Furnish to the General Contractor and other trades all information relative to the position of the plumbing installation that will affect them so that they may plan their work and installation accordingly.

3.5 SUPPLEMENTARY STEEL, CHANNEL AND SUPPORTS

A. Furnish and install all supplementary steel, channels and supports required for the proper installation, mounting and support of all equipment.

B. Supplementary steel and channels shall be firmly connected to building construction in a manner approved by the Architect/Engineer.

C. The type and size of the supporting channels and supplementary steel shall be determined by the Plumbing Subcontractor and shall be sufficient strength and size to allow only a minimum deflection in conformance with the manufacturer's requirements for loading.

D. All supplementary steel and channels shall be installed in a neat and workmanlike manner parallel to the walls, floor, and ceiling construction. All turns to be made with 90 degree fittings, as required to suit the construction and installation conditions.

3.6 SLEEVES AND INSERTS

A. Sleeves shall be furnished, set, and properly secured in place and at all points where piping passes through masonry or concrete. All sleeves shall be of sufficient diameter to provide 1/4-in. clearance around the pipe.

B. Sleeves through concrete slabs, and interior concrete and masonry walls or partitions shall be steel pipe. Fire stop annular openings between sleeves and pipes at floor slab passages and make watertight. Galvanized sleeves and copper piping shall not be placed in concrete.

C. Install UL listed and FM approved inserts or other anchoring devices in concrete and masonry construction as required to support piping. Inserts shall be of the adjustable type as manufactured by Carpenter and Patterson, Grinnell, or Fee and Mason.

3.7 SYSTEM IDENTIFICATION

A. All valves on pipes of every description shall have circular brass valve tags of at least 1-1/2 in. in diameter, attached with brass hooks to each valve stem. Stamp number of the valve and the service, such as "HW", "CW", "GAS", etc., for hot water, cold water, gas, etc., respectively. The numbers of each service shall be consecutive and shall correspond with the numbers indicated for valves and controls on the record drawings and on three printed valve lists. These printed lists shall state number and locations of each valve and control and the section, fixture or equipment which it controls.

B. The printed valve lists shall be prepared in a form to meet the approval of the Architect and Engineer and one copy shall be framed under glass and mounted in approved locations.

C. All plumbing lines and equipment shall be identified by pipe markings, which shall be provided by this Contractor. Markers shall be applied every 20 ft. Markings shall indicate pipe content and direction of flow. The markers shall be as manufactured by Seton Name Plate Corp. or equal.

3.8 SAFETY PRECAUTIONS

A. Furnish, place, and maintain proper guards for the prevention of accidents and any other necessary construction required to secure safety of life and property.

3.9 INSERTS AND OPENINGS

A. Inserts: Install inserts or other anchoring devices in concrete and masonry construction as required to support piping. Inserts shall be of the adjustable type as manufactured by Carpenter and Patterson, Grinnell of Fee and Mason.

B. Escutcheons: All exposed pipe, uncovered, passing through walls, floors or ceilings shall be fitted with one piece chrome plated brass escutcheons with set screw holding in position. Floor escutcheons to be deep enough to fit over sleeves, fastened to pipe and extending down to floor.

3.10 PLANS AND SPECIFICATIONS

A. The drawing showing layout of the plumbing systems indicate the approximate location of outlets, apparatus and equipment are schematic. The final determination as to the routing shall be governed by structural conditions and other obstructions.

B. The right to make any reasonable change in the location of outlets, apparatus, and equipment up to the time of the roughing-in is reserved by the Architect and Engineer without involving any expense to the Owner or the General Contractor.

C. The specifications supplement the drawings and provide specifics pertaining to the methods of material to be used in the execution of the work.

3.11 SANITARY WASTE, STORM WATER AND VENT SYSTEMS

A. Furnish and install piping to take wastes from all soil and waste stacks, fixtures, drains and equipment as indicated and/or described in these plans and specifications.

B. Unless specifically noted otherwise on the plans, all horizontal piping 4 in. and larger shall be pitched at the rate of 1/8 in. per foot in the direction of the flow. Horizontal piping 3 in. and smaller shall be pitched at the rate of 1/4 in. per foot in the direction of the flow.

3.12 INSULATION

A. Ensure that all pipe and fitting surfaces over which insulation is to be installed are clean and dry.

B. Ensure that insulation is clean, dry, and in good mechanical condition with all factory-applied vapor or weather barriers intact and undamaged. Wet, dirty, or damaged insulation shall not be acceptable for installation.

C. Ensure that pressure testing of piping and fittings has been completed prior to installing insulation.

D. General

1. Install all insulation materials and accessories in accordance with manufacturer's published instructions and recognized industry practices to ensure that it will serve its intended purpose.

2. Install insulation on piping subsequent to installation of heat tracing, painting, and acceptance tests.

3. Install insulation materials with smooth and even surfaces. Insulate each continuous run of piping with full-length units of insulation, with single cut piece to complete run. Do not use cut pieces or scraps abutting each other. Butt insulation joints firmly to ensure complete, tight fit over all piping surfaces.

4. Maintain the integrity of factory-applied vapor barrier jacketing on all pipe insulation, protecting it against puncture, tears, or other damage. All staples used on cold pipe insulation shall be coated with suitable sealant to maintain vapor barrier integrity.

E. Fittings

1. Cover valves, fittings, and similar items in each piping system using one of the following:

2. Mitered sections of insulation equivalent in thickness and composition to that installed on straight pipe runs.

3. Insulation cement equal in thickness to the adjoining insulation.

4. Owens Corning PVC Fitting Covers insulated with material equal in thickness and composition to adjoining insulation.

F. Penetrations

1. Extend piping insulation without interruption through walls, floors, and similar piping penetrations, except where otherwise specified.

G. Joints

1. Butt pipe insulation against hanger inserts. For hot pipes, it is recommended all joints be staggered when operating temperature is over 400F (204C) double layer. Seal jacketing according to type being used. For cold piping, seal self-sealing laps by firmly rubbing down surface of tape and flap.

2. All pipe insulation ends shall be tapered and sealed, regardless of service.

H. Vertical Piping

1. If specified on contract drawings, all insulated, exposed vertical piping within the building and all insulated piping exposed to the outdoors shall be additionally jacketed with 0.016" thick (0.4 mm) (minimum) aluminum. Vertical piping shall be protected to a height of 8'-0" (2.4 m) above the floor.

I. Field Quality Assurance

1. Upon completion of all insulation work covered by this specification, visually inspect the work and verify that it has been correctly installed. This may be done while work is in progress, to assure compliance with requirements herein to cover and protect insulation materials during installation.

J. Protection

1. Replace damaged insulation, which cannot be satisfactorily repaired, including insulation with vapor barrier damage and moisture-saturated insulation.
2. The insulation contractor shall advise the general and/or the mechanical contractor as to requirements for protection of the insulation work during the remainder of the construction period, to avoid damage and deterioration of the finished insulation work.

K. Safety Precautions

1. Insulation contractor's employees shall be properly protected during installation of all insulation. Protection shall include proper attire when handling and applying insulation materials and shall include (but not be limited to) disposable dust respirators, gloves, hard hats, and eye protection.
2. The insulation contractor shall conduct all job site operations in compliance with applicable provisions of the Occupational Safety and Health Act, as well as with all state and/or local safety and health codes and regulations that may apply to the work.

END OF SECTION

SECTION 23 0000

MECHANICAL

PART 1: GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 SUMMARY OF WORK

A. Provide complete functional Heating, Ventilating and Air Conditioning system as shown on Mechanical Construction Documents.

1.3 REFERENCE STANDARDS

A. NFPA Standards

B. ANSI Standards

C. ASME Standards

D. ASTM Standards

E. AWWA Standards

F. ASHRAE Standards

G. SMACNA Standards

H. OSHA Standards

I. NEBB Standards

J. Local Codes and Ordinances

K. Owner's Insurance Company Requirements

L. Where the contract documents indicate more stringent requirements than the above codes and ordinances, the contract documents shall take precedence.

M. File all documents, pay all fees and secure all permits, inspections and approvals necessary for the work of this section.

1.4 CONTRACT DRAWINGS & SPECIFICATIONS

A. The Contract Drawings are generally diagrammatic and convey the Scope of Work and General Arrangement of apparatus and equipment. The locations of all items shown on the drawings or called for in the specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect and Engineer before being installed. The Subcontractor shall follow drawings in laying out work and shall check drawings of the other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. If directed by the General Contractor, Engineer and/or Architect, the Subcontractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or before proper execution of the work.

B. Specifications: The specifications are intended only to complement the drawings; however, work detailed and/or noted only on the drawings or work described only in the specifications

shall all be considered as part of the scope of work.

1.5 CONFLICT BETWEEN PLANS AND SPECIFICATIONS

A. In case of conflict between the contract drawings and specifications, the Engineer shall determine which takes precedence.

1.6 SHOP DRAWINGS AND PRODUCT DATA

A. SUBMITTALS: Submit shop drawings, manufacturers data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication, or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry, and technical society publication references, and other information necessary to establish contract compliance of each item the Contractor propose to furnish.

B. Submit in accordance with Division 1.

C. It is the intent of these specifications that all equipment, materials and workmanship used on this project be in complete conformance with all local, state and national codes, ordinances and standards.

D. Substitutions shall be equivalent to specified equipment in all aspects of quality and performance and shall conform to the intent stated above. It is the contractor's responsibility to submit only those items that meet these requirements. Should any non-conforming items be installed, they shall be replaced by the contractor at no additional cost to the owner.

E. The approval of the equipment does not relieve the Subcontractor of responsibility of shop drawing errors related to details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the Specifications, and/or job conditions as they exist.

F. Refer to General Requirements for the substitutions of equipment and submittal of shop drawings. If apparatus or materials are substituted for those specified, and such substitution necessitates changes in, or additional connections, piping, supports, or construction, it shall be provided. Contractor to assume cost and entire responsibility thereof.

1.7 INSPECTION AND TESTS

A. During the progress of the work it shall be subject to the inspection of the Owner and to such other inspectors, as may have jurisdiction.

B. At completion of the work, Contractor shall submit to the Owner's representative in writing a statement stating: (1) that the work is complete; (2) that the entire installation is in accordance with the specification; (3) that preliminary tests have been made; and (4) that the work is ready for final inspection and test.

C. A final inspection of the installation to determine compliance with the drawing and specifications will be made by the Owner's representative. Work will be checked for quality of materials, quality of workmanship, proper installation and finished appearance. This Contractor shall provide the services of the project foreman for inspection purposes. The foreman shall remove and reinstall access panels, ceiling tiles, etc., as required to facilitate any inspections required by the Owner's representative.

D. The Contractor shall arrange and conduct operating tests on all equipment in the presence of the Owner's representative. The component parts of systems and the various systems shall be demonstrated to operate in accordance with the requirements and intent of this specification. Any non-complying or defective materials or workmanship disclosed as a result of the inspection and the Contractor shall correct tests promptly, and the tests repeated as

often as necessary until approved and accepted by the Owner's representative.

1.8 ELECTRICAL EQUIPMENT

A. Electrical components of mechanical equipment and systems, such as motors, factory mounted motor starters, disconnects, and control equipment shall be provided under the related Section of Division 23.

B. Temperature control equipment, including thermostats, zone valves, relays, aquastats, etc. shall be provided under related sections of Division 23. Temperature control wiring not specifically shown on electrical drawings shall be provided under related Section of Division 23.

C. Upon completion of temperature control system wiring, the responsibility of the control system will fall under Division 23.

D. All electrical equipment installed in concealed spaces shall be provided with a hard-wired electrical connection. Plug-type disconnects shall not be allowed in concealed spaces. Equipment provided with plug-in cords shall not have their cords modified.

1.9 OPENINGS IN EXTERIOR WALLS OR ROOF

A. Openings in exterior walls or roof shall be kept properly plugged and caulked at all times, except when being worked on to preclude the possibility of flooding due to storm or other causes. After completion of work, openings shall be permanently sealed and caulked in a manner approved by the Architect.

1.10 GUARANTEE

A. Except as otherwise specified, all work, materials and equipment shall be guaranteed against defects resulting from the use of inferior materials, equipment, or workmanship for one year from the date of final completion of the contract, or from full acceptance by the Owner, whichever is earlier.

B. If, within any guarantee period, repairs or changes to guaranteed work are required as a result of the use of defective materials or equipment, inferior workmanship or work that is not in accordance with the terms of the contract, and upon receipt of notice from the Owner, the following shall be done without expense to the Owner.

C. Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein.

D. Repair all damage to the building or site/equipment or contents thereof which is the result of the use of defective materials or equipment or inferior workmanship, or of work not in accordance with the terms of the contract.

E. Make good any work or materials, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.

F. In fulfilling the requirements of the contract or of any guarantee embraced in or required thereby, any work guaranteed under another contract is disturbed, restore such disturbed work to original condition and guarantee such restored work to the same extent as it was guaranteed under such other contract.

G. If upon failure to proceed promptly after notice to comply with the terms of the guarantee, the Owner may have the defects corrected and Contractor and his surety shall be liable for all expenses incurred.

H. This Contractor shall obtain in the General Contractor's and Owner's name, the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities, which the Contractor may have by

law or other provisions of the Contract Documents. The guarantee shall be for a period of one (1) year minimum from the date of acceptance or final payment.

1.11 CLEANING OF SYSTEM

A. Thoroughly clean piping, ducts, fixtures and equipment of all foreign substances inside and out before placing in operation. All air handling equipment shall be provided with “construction filters” for use during construction. Once construction is substantially complete and prior to final testing adjusting and balancing, furnish and install new filters for each piece of equipment.

B. If any foreign matter should stop any part of a system after being placed in operation, clean and reconnect system.

C. Remove all covers of interior floor drains and cleanouts, clean of all dirt, concrete traces, etc., then lightly grease and reinstall.

1.12 TEMPORARY OPENINGS

A. Coordinate construction and provide temporary openings in the building as required for the admission of equipment furnished under this Division.

1.13 DEFINITIONS

A. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories relating to such piping.

B. "Concealed" means hidden from sight in trenches, chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.

C. "Exposed" means not installed underground or "concealed" as defined above.

D. "Provide" means furnish and install complete and ready to operate.

1.14 EQUIPMENT DEVIATIONS

A. Where proposals to use an item of equipment other than that specified which requires any redesign of the structure, partitions, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Architect at the Contractor’s expense.

B. Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the drawings, furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.15 ELECTRICAL ROOM REQUIREMENTS

A. Do not install any piping, ductwork or equipment in or through electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms, unless piping or ductwork of equipment is intended to serve these rooms. Additionally, no ductwork or piping will be installed above electric panels. If the Contractor violates this requirement, he shall remove and/or relocate all items as required at his expense and to the satisfaction of the Architect.

1.16 COOPERATION WITH OTHER TRADES

A. Give full cooperation to other trades and furnish in writing to the Architect any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

B. Coordination drawings shall be initiated by this contractor. It this contractor's responsibility for preparation of project coordination drawings showing the installation of all equipment, piping, ducts and accessories to be provided under Section 230000 of the Specifications.

1. Drawings shall be prepared at not less than 1/4 in. = 1 ft. scale, and shall show building room layouts, structural elements, ductwork and lighting layouts of function. Drawings shall indicate horizontal and vertical dimensions, to avoid interference with structural framing, ceilings, partitions, and other services.
2. A reproducible copy of each drawing prepared shall then be submitted to each Contractor working under Sections 210000, 220000, and 260000, who shall be responsible to coordinate his equipment and systems and shall show these on the drawings submitted.
3. After each Contractor has fulfilled his obligation, he shall return the drawings to the HVAC Contractor. After each drawing has been coordinated between trades, and appropriate revisions made, each trade shall sign each drawing, indicating acceptance of the installation.
4. The HVAC Contractor shall then print the coordination original and these prints submitted through the General Contractor to the architect for review and comment, similar to shop drawings. Comments made on these drawings shall result in a correction and re-submittal of the drawings.

C. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

1.17 PROJECT RECORD DOCUMENTS:

A. Each Contractor shall record clearly, neatly, accurately, and promptly as work progresses the following data:

1. Changes made resulting from change orders or instructions issued by the Architect.
2. Changes in routing made to avoid conflict with other trades or structural conditions.
3. Final location of equipment and panels if different than contract documents.

B. Upon completion of the project submit to the Architect a set of electronic media noting "as built" conditions indicating all variations and deviations of his work from contract documents.

1.18 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Operating Instructions: Provide operating instructions to the Owner's designated representative with respect to the operation functions and maintenance procedures for all equipment and systems installed. The cost of providing a manufacturer's representative at the site for instructional purposes shall be included in the Contract Price.

B. Maintenance Manuals: At the completion of the project, turn over to the General Contractor four (4) complete manuals in 3-ring binders, indexed, containing the following:

1. Complete shop drawings of all material and equipment of this section.
2. Operation descriptions of all systems.
3. Names, addresses and telephone numbers of all suppliers of system components.
4. Preventative maintenance instructions for all systems.
5. Spare parts list of all system components.
6. Copies of all valve charts.

1.19 PROTECTION

A. Protect all work and material from damage by work and workmen, and accept liability for all damage thus caused.

B. Be responsible for work and equipment until finally inspected, tested, and accepted. Protect work against theft, injury or damage; and carefully store material and equipment received on site, which is not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

C. All openings in stored & installed ductwork shall be covered & sealed when not in use to prevent contamination from dust & debris.

1.20 SCAFFOLDING, RIGGING AND HOISTING

A. Provide scaffolding, rigging, hoisting and services necessary for delivery, erection and installation of material, equipment and apparatus furnished under this division. Remove same from premises upon completion of work.

B. Coordinate propose routing with architect prior to rigging and protect all existing building components against damage.

1.21 MATERIALS AND WORKMANSHIP

A. All materials and apparatus required for the work, except as specifically specified otherwise, shall be new, of first-class quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of material is given, a first-class standard article as approved by the Architect shall be furnished.

B. Furnish the services of an experienced foreman who shall be constantly in charge of the installation of the work, together with all skilled workmen, fitters, metal workers, welder, helpers, and labor required to unload, transfer, erect, connect, adjust, start, operate, and test each system.

C. All equipment and materials shall be installed in strict accordance with the manufacturer's recommended installation instructions as well as UL Listing instructions and all Local, State and National codes.

1.22 QUIET OPERATION AND VIBRATION

A. Work shall operate under all conditions of load without any objectionable sound or vibration. In case of moving machinery, sound, or vibration noticeable outside of room in which it is installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable shall be corrected in an approved manner at no expense to the Owner. Vibration control shall be means of approved vibration eliminators in a manner as recommended by the manufacturer of the eliminators.

1.23 ACCESSIBILITY

A. Assure and be responsible for the adequacy of shafts and chases, the adequate clearance in double partitions and hung ceilings for the proper installation of the work. Cooperate with all other trades whose work is in the same space. Such spaces and clearances shall, however, be kept to the minimum size required.

B. Locate all equipment, which must be serviced, operated, adjusted or maintained fully accessible positions. Equipment shall include, but not be limited to, valves, traps, cleanouts, motors, controllers, filters, dampers, starters, coils, fire dampers, smoke dampers and drain points. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be made to allow for better accessibility, and the engineer shall approve any change.

1.24 CUTTING AND PATCHING

A. Provide all cutting and patching necessary to install the work specified in this division. Patching shall match adjacent surfaces.

B. At floor slabs & wall openings to be cored drilled or cut, contractor shall find and mark on both faces all reinforcing, rebar, conduits, utilities, etc.. by means of x-ray, pach-ometer or prof-ometer. Submit sketch showing locations of all findings and proposed cuts or cores for review.

C. No structural members shall be cut without the approval of the Structural Engineer, and all such cutting shall be accomplished in a manner directed by the Structural Engineer.

1.25 GROUNDING

A. All components of mechanical piping systems shall be properly grounded to building ground. Where ground path is interrupted by non-conductive materials, appropriate bonding or grounding to building ground shall be provided.

1.26 WATERPROOFING

A. Where any work pierces waterproofing including waterproof concrete, the method of installation shall be as approved by the Architect before work is started. Furnish all necessary sleeves required.

1.27 DEMOLITION

A. Prior to submitting bid, visit site and identify existing conditions and difficulties that will affect work of this section. Demolition work will require careful site examination prior to bidding. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers.

B. Prior to commencing demolition, contractor shall identify with owner any equipment to be returned to the owner after demolition. All other debris shall be disposed of by this contractor in accordance with all applicable regulations. Any shutdowns required for demolition shall be coordinated with building owner to avoid impact to operations.

C. During demolition, any equipment, ductwork, piping, etc. found to be abandoned shall be demolished. Existing unused connections to existing ducts or piping shall be cut back to the mains and capped accordingly.

D. Under demolition, the following is, in brief, the extent of the work to be performed by the mechanical contractor under this contract.

1. The mechanical contractor shall be responsible for the disconnection and removal of the existing mechanical equipment, ductwork, piping, valves, etc.,in designated areas. Cut & cap piping and ductwork back to mains. Patch all roof and wall penetrations to match existing.

2. This contractor shall protect work against injury or damage; and carefully store material and equipment to be relocated. Open ends of work shall be closed with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

3. All existing HVAC components, including but not limited to ductwork, piping, equipment, controls & accessories, shall be removed from the area of renovation.

4. Coordinate all demolition with other trades to ensure all relevant portions of the system including associated electrical and plumbing components are removed.

5. Refer to drawing plans and notes for additional information.

PART 2: PRODUCTS

2.1 IDENTIFICATION, MARKING AND TAGGING

A. Systems and equipment to be identified and marked and valves tagged include, but are not limited to the Heating, Air Conditioning & Ventilating systems.

B. Submit samples of marking and tagging devices and wording, lettering and numbering scheme for each system.

C. Equipment Identification:

1. Manufacturer's nameplates or trademark shall be permanently affixed to all equipment and materials furnished under this division. Manufacturer's nameplates shall include all pertinent data relative to the piece of equipment including model number, serial number, and operating characteristics as applicable.

2. Separate Equipment Identification Markers shall identify each item of equipment with a permanently attached marker indicating designation and/or number corresponding to design documents.

3. Markers shall be of rigid black Bakelite or phenolic construction with white engraved or incised letters.

4. Lettering on equipment markers shall be of adequate size to be legible from floor levels. In all cases marker lettering shall no be less than 1 inch high.

2.2 SUPPORTS & ATTACHMENTS

A. Provide all necessary supports and bases required for all equipment, piping and for all other equipment furnished under this contract. Submit shop drawings to the Architect for approval before purchase, fabrication or construction of same.

B. All equipment, unless shown otherwise, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are not strong enough shall be replaced as directed.

2.3 ELECTRIC MOTORS/STARTERS

A. Electric motors and starters shall conform to requirements of the AIEE, NEMA, UL, and NEC and shall be suitable for load duty, voltage, phase, frequency, service and location required. Provide inverter duty rated motors for use with variable frequency drives. Provide shaft grounding rings for all VFD controlled motors.

B. All motors shall be rated at 85% power factor at full rated load. Motors less than 85% power factor shall be corrected to 90% power factor at the factory. All motors shall be rated high efficiency.

C. Starters shall be Cerus International or equal.

1. Enclosed Non-Combination Starter

a) Motor Starter shall be enclosed in a Type 1 or Type 4 UL rated enclosure.

b) Motor Starter shall be rated for NEMA class B motors for AC-3 switching and AC-4 switching.

c) Controls and annunciation shall include Hand- OFF- Auto keypad. LED indication shall include Hand, Off, Auto, Run and Overload. Overload reset shall be available.

d) Control inputs shall include: Auto Wet input, Auto Dry input, Permissive Auto input, Damper Status Input and Override Input. Automatic control inputs shall be capable of accepting a transistorized input without the need for

interposing relays. Wet control inputs shall accept AC or DC inputs from 10 to 138VACor DC.

e) Damper control shall be built into the starter to provide 24VAC or 120VAC damper control and monitoring.

f) Override input shall disable the starter from operating in either Hand or Auto mode.

g) Protective Functions

(i) Electronic Overload shall provide phase failure and phase loss protection, stall, and class 1 - 30 selectable overload protection. Phase failure protection shall initiate when phase loss is greater than 70% for 3 seconds or phase unbalance is greater than 50% for more than 5 seconds.

(ii) Cycling fault protection shall be integral to the starter. Cycling fault shall be enabled whenever the starter is cycled more than 1000 times in a one hour period. This feature shall be selectable to be disabled. Cycling fault shall cause overload LED to blink rapidly.

2. Enclosed Combination Starter

a) Enclosed combination starter shall include all of the above descriptions in addition to either a motor circuit protector with lock-out mechanism, a UL 508 breaker, or a fused disconnect with lock-out mechanism.

b) The Motor Circuit protector shall be a UL listed 508 manual motor starter with magnetic trip elements only. The breaker and shall carry a UL 508F rating (up to 100A frame size) which provides for coordinated short circuit rating for use with the motor contactor and provides an interrupting rating for the breaker and contactor combination.

c) Fused disconnect shall be UL 98 suitable for service entrance protection.

d) UL 508 breaker shall include thermal and magnetic trip mechanisms.

2.4 USE OF INSTALLATION

A. The Owners shall have the privilege of using any part of the installation when sufficiently complete, but such use thereof, or partial or final payment shall not be considered as an acceptance of such work in lieu of a written certificate from the Engineer.

2.5 PIPING INSULATION

A. Insulation

1. Refrigerant Piping: Flexible closed cell insulation.

2. Plenum Return Applications: All insulation, jackets and accessories shall be rated for use in return air plenums.

B. Compliance: Insulation thickness, conductivity and installation shall comply with local Mechanical and Energy Codes.

C. Minimum Pipe Insulation:

1. Chilled Water/Cold Condensate/Refrigerant: 1-1/2” Thick, ≤ 1-1/2” Nominal Pipe Diameter

2. Chilled Water/Cold Condensate/Refrigerant: 1-1/2” Thick, > 1-1/2” Nominal Pipe Diameter

D. Condensate Piping

1. All condensate piping, regardless of temperature, shall be provided with insulation.
2. Condensate generated by cooling coils shall be considered Low Temperature Fluid.

E. Fittings: Factory precut insulation inserts, thickness to be same as adjacent. Enclose in premolded, PVC fitting covers.

1. Low Temperature Applications: Fittings and valves shall be wrapped continuously with wicking material prior to installing insulation to ensure a continuous path for removal of condensation.

F. Jackets:

1. Interior: Factory applied, all service jacket of white Kraft bonded to aluminum foil reinforced with fiberglass yarn and suitable for painting. Longitudinal and butt joints shall be made with factory applied pressure sensitive material.
2. Exterior/Exposed (Low Temperature): Field applied, 20 mil, PVC sheet material.
3. Exterior/Exposed (High Temperature): Field applied, Aluminum sheet material.
4. All jackets exposed to the weather shall be reflective, UV resistant and sealed watertight.

G. Preparation

1. Install materials after piping has been tested and approved.

H. Installation

1. Install materials in strict accordance with manufacturer's instructions.
2. Continue all insulation through penetrations.
3. In piping exposed to view, locate insulation and cover seams in least visible locations.
4. On piping that requires condensation control, (i.e. chilled or cold) insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
5. On piping not requiring condensation control (i.e. steam, condensate hot water) do not insulate flanges and unions at equipment, but bevel and seal ends of insulation at such locations.
6. Provide pipe insulation with weatherproof jacket on exterior piping that has heat trace.

PART 3: EXECUTION

3.1 OPERATING INSTRUCTIONS

A. Instruction to the Owner's Personnel - After completion of all work and all tests and at such times as designated by the Architect, provide the necessary skilled personnel to operate the entire installation until receipt of owners acceptance.

B. During the operating period, instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

C. Give at least forty-eight (48) hours advance notice to the Owner to coordinate scheduling of this instructional period.

D. Furnish to the Architect five (5) complete bound sets of typewritten or blueprinted instruction manuals for operating and maintaining all systems and equipment included in the contract. All

instruction manuals shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions.

E. The above-mentioned instructions shall include the maintenance schedule for the principal items of equipment furnished under this contract.

3.2 MANUFACTURER'S RECOMMENDATIONS:

A. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

3.3 TESTING, ADJUSTING, STARTING UP AND COMMISSIONING

A. Testing: All work must be proved satisfactory. The tests herein specified shall be applied in the presence of, and to the satisfaction of, the Architect before the work is covered, concealed or made inaccessible to testing, repair, correction or replacement. Accommodate the testing operation to the progress of the project as a whole. Correct all defects appearing under test and repeat the tests until all parts of the work have been successfully tested. Apply the specific tests herein described. Present all work for acceptance in clean condition, properly adjusted and in good working order; for instance, all machinery must be quiet, well balanced, and must be in place and reading accurately. All systems, equipment, controls, and devices in this work shall be tested in operation and must prove for their purposes in the judgment of the Architect or his authorized representative. All internal surfaces of all lines and equipment shall be blown or flushed clean. Where pressure tests are specified, the apparatus shall be clean before the tests are applied. Contractor shall provide adequate protection of piping and duct systems to prevent vandalism and/or accidental damage, blockage, etc., that will hinder or prevent proper operation of the finished systems.

1. Provide instruments, pumps, gauges, supplies, equipment, materials, and labor for testing and starting up. Dispose of test water and wastes after test, in a manner approved by all applicable codes.
2. Perform tests which may be required by authorities or agencies in addition to those herein specified.
3. Furnish certified shop test records for all pressure vessels. After installation, test at full operating pressures and temperatures maintained for one hour. Set and test all pressure control, relief and safety devices.
4. Repair or replace all defective work and repeat tests until the particular system and component parts thereof receive the approval of the Architect.
5. The duration of tests shall be as determined by authorities having jurisdiction, but in no case less than the time prescribed in each section of the specifications.
6. Test equipment and systems, which normally operate during seasons of the year during the appropriate season. Perform tests on individual equipment, systems and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and controls for proper operation, function, and performance; the latter shall be operated simultaneously with the equipment of system being tested.

B. Adjusting, Balancing and Starting Up

1. Flush clean all systems prior to starting up the system. Any damages to the building or system components caused by failure to clean the systems properly shall be corrected to the satisfaction of the Architect or his authorized representative at no

additional cost to the Owner.

2. Run motor-driven equipment continuously for at least two hours in the presence of the Architect. Correct all defects of noise, vibration, alignment and balance. Replace all motors, which overheat or are noisy.
3. Balance systems completely for temperature, volume, and pressure per NEBB performance standards. Balancing subcontractor shall provide proof of certification by NEBB.
4. Air volumetric flow rates shall be within ten (10) percent of those specified. Air and water quantities and pressures shall be tested, balanced and recorded at all terminal devices. Volumetric flows and pressures shall be recorded on suitable forms and submitted for approval.
5. Provide any and all labor and equipment necessary to properly balance the installation including but not limited to dampers, valves, flow stations, test ports, sheaves, belts, etc.
6. All sequences of the system shall be checked and all temperature controls operated and commissioned as required to insure that all systems operate per Engineers intent.

C. Commissioning

1. This Contractor shall provide the deliverables to the engineer/owner.
2. Copies of all records shall be provided to the Engineer by this Contractor including, but not limited to:
    a) Equipment manuals including the name of at least one service agency;
    b) Testing and Balancing reports;
    c) Functional performance testing of the equipment, controls, economizers, and lighting control systems.
3. All commissioning shall be performed as indicated here and elsewhere in the specifications and shall comply with provisions of the applicable Energy Conservation Code.

3.4 SEQUENCE OF OPERATIONS

A. Sequence of Operations: This is a performance-based specification intended to convey the control intent of the various systems. The contractor shall provide detailed shop drawings including P&ID diagrams, equipment lists and finalized sequences for review by the Engineer prior to installation. Any questions concerning specific details shall be referred to the engineer for clarification.

B. System: It is the intent of this specification that complete stand-alone controls be provided for each mechanical system to provide the sequences noted.

C. System: It is the intent of this specification that programmable electronic controls be provided to control occupied/unoccupied modes of all HVAC systems within the facility. Systems shall be provided with all additional required controls including, but not limited to, space mounted monitoring and user interface devices, to provide the specified sequence.

D. Equipment and Wiring: This contractor shall provide all control equipment, and wiring (regardless of voltage) to accomplish the sequence of operations as detailed below. This contractor shall carry funds sufficient to hire the Electrical Contractor to provide line-voltage power, including any required wiring, breakers, and/or disconnects, to all control's components needing such power. Such components shall include, but may not be limited to:

1. Control Transformers

2. Central Equipment Controllers
3. Line-voltage Thermostats or other sensors

E. Control and Monitoring: Sensors shall be provided throughout the HVAC systems (hydronic and air) as required to control and monitor their operation. Provide sensors with remote mounted stats where indicated on the drawings. Where multiple space mounted sensors are required for a given unit they shall be located in the same general area.

F. Ductless Split System A/C

1. Cooling: In the cooling mode, the supply fan shall run and the refrigeration circuit shall be energized and cycle to maintain the cooling setpoint of the space/unit mounted temperature sensor. When the cooling setpoint is reached, the reverse shall occur.

SECTION 26 0000

ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED SECTIONS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this section.
B. This Contractor shall also include allowances for startup and for making the systems fully operational, and for scope and design contingencies. Future changes in price for items not shown on these drawings will not be allowed if the system itself is shown on these Drawings.
C. Give notices, file plans, obtain permits and licenses, pay fees and back charges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements and with Specifications, Drawings, Addenda and Change Orders, all of which are part of Contract Documents.
D. The drawings show the layout of the electrical systems and indicate the approximate locations of outlets, apparatus, and equipment. The runs of feeders and branches as shown on the drawings are schematic only. The exact routing of branch circuits and feeders shall be determined by the structural conditions and possible obstructions. This shall not be construed to mean that the design of the systems may be changed but refers only to exact runs between given points. The Engineer reserves the right to revise the drawings from time to time to indicate changes in the work.
E. The Contractor shall consult and review all contract and reference drawings which may affect the location of any outlets, apparatus and equipment to avoid any possible interference and permit full location of outlets, apparatus and equipment up to the time of rough-in is reserved by the Engineer and such change shall be made without additional expense to the Owner.
F. It shall be the responsibility of this Contractor to see that all electrical equipment such as junction and pull boxes, panelboards switches, controls and such other apparatus as may require maintenance and operation from time to time is made accessible. Although the equipment may be shown on the drawings in certain locations, the construction may disclose the fact that such locations do make its position accessible. In such cases this Contractor shall call the attention of the Engineer to the condition before advancing the construction to a state where a change will reflect additional expense to the Owner.

1.2 SUMMARY

A. This Section specifies the basic requirements for electrical installations and includes requirements common to more than one section of Division 26. It expands and supplements the requirements specified in sections of Division 1.
B. These documents have been prepared with the intention that they call for finished, tested work, in full operating condition and complete with necessary accessories.
C. The contract drawings are generally diagrammatic and convey the scope of work and general arrangement of apparatus and equipment. The locations of all items shown on the drawings or called for in the specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect/Engineer before being installed. The Contractor shall follow the drawings in laying out work and shall check drawings of the other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. If directed by the General Contractor, Engineer and/or Architect, the Contractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.
D. These contract documents are complementary. What is called for by one shall be as binding as if called for by all. Materials or work described in words, which have well-known technical, or trade meaning shall be held to refer to such recognized standards. Incidental devices and accessories needed for

complete, operational systems shall be provided even though they may not be indicated or identified in the documents.

E. If apparatus have been omitted, notify the Architects/Engineers of such belief. It is understood that bidder has included all required items and work in his bid, and will not if bid is successful, claim extra compensation for furnishing a complete and satisfactory system. If a particular item is called for or specified more than once in these contract documents, the higher grade shall be considered specified.
F. Should it appear that the character of the work is not sufficiently explained in these specifications or on the drawings, apply to the A/E for further information. Conform to the A/E's decision and directions as shall become part of these contract documents. The A/E reserves the right to be sole interpreter of the drawings and specifications, and all decisions shall be conclusive, final and binding on the parties.
G. Materials called for in these documents shall be new, unused equipment and of the latest recognized standards.
H. The work to be done under Division 16 is shown on the electrical drawings.

1.3 OUTLINE SCOPE OF WORK

A. The work under this contract, without limiting the generality thereof, includes all materials, labor, equipment, services, and transportation, unless otherwise specified, necessary to complete all systems of electrical wiring and equipment required by the drawings and/or as specified herein. It is the intent of this section and accompanying electrical drawings that these systems be furnished complete in every respect. The Electrical Contractor shall furnish all wiring, equipment and labor needed for a complete operating installation.
B. The Electrical Contractor shall fully indemnify the Owner against any damages, removals and alteration work. This is in addition to the requirements of the General Conditions of the Specifications.
C. The Electrical Contractor shall review architectural, interior design and all other trades plans, elevations and details prior to any work and identify any conflicts between furnishings, furniture, art-work, molding, casework, televisions, signage, awnings, canopies, diffusers, fixtures, etc.. and electrical, fire alarm, audio/visual and communications devices shown on the electrical plans and details. The Electrical Contractor shall prepare 8.5” x 11” sketches showing the conflicts and submit to the Architect for resolution prior to any work. Failure of the electrical contractor to coordinate, identify and obtain a field-directive on any conflict herein noted, that results in installed electrical work to be relocated to the Owner/Architects liking shall be the sole-responsibility of the Electrical Contractor. The Electrical Contractor shall assume and cover all costs associated with conflicts not coordinated, identified and submitted to the Architect, inclusive of material, labor, overtime pay, etc.. and shall not affect the project schedule.

1.4 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
B. Refer to equipment specifications in Divisions 2 through 25 for rough-in requirements.

1.5 SURVEYS AND MEASUREMENTS

A. Base measurements, both horizontal and vertical, on established bench marks. Work shall agree with these established lines and levels. Verify measurements at site and check the corrections of same as related to the work.
B. Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the drawings and specifications, he shall notify the A/E.

1.6 EXAMINATION OF SITE

A. Prior to submitting bid, visit the site where the work is to be performed and the materials are to be delivered. Failure in this respect shall not excuse the Contractor from his obligation to supply and install the work in accordance with the plans and specifications and under all conditions, as they exist.
B. By submitting a bid, this Contractor warrants that all specification sections and drawings showing equipment for plumbing, heating, ventilation, air conditioning, electrical, and architectural, have been examined and is familiar with the conditions and extent of work affecting this contract.

1.7 EQUIPMENT AND MATERIALS

A. All equipment and materials for permanent installation shall be the products of recognized manufacturer's and shall be new, unless noted for re-use, without damaged, functional or aesthetic components.
B. New equipment and materials shall:
    1. Be Underwriters Laboratories, Inc. (UL) labeled and/or listed where specifically called for, or where normally subject to such UL labeling and/or listing services
    2. Be without blemish or defect.
    3. Be in accordance with the latest applicable NEMA standards.
    4. Be products, which will meet with the acceptance of the agency inspecting the electrical work. Where such acceptance is contingent upon having the products examined, tested and certified by UL or other recognized testing laboratory, the product shall be so examined, tested and certified.
C. For all equipment, which is to be installed but not purchased as part of the electrical work, the electrical work shall include:
    1. The coordination of their delivery.
    2. Their unloading from delivery trucks driven in to any point on the property line at grade level.
    3. Their safe handling and field storage up to the time of permanent placement in the project.
    4. The correction of any damage, defacement or corrosion to which they may have been subjected.
    5. Their field make-up and internal wiring as may be necessary for their proper operation.
    6. Their mounting in place, including the purchase and installation of all dunnage, supporting members and fastenings necessary to adapt them to architectural and structural conditions.
D. Equipment, which is to be installed but not purchased as part of the electrical work, shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the electric work will be considered only if presented in writing within one week of the date of delivery to the project of the items in question. The electric work includes all procedures, regardless of how extensive, necessary to put into satisfactory operation, all items for which no claims have been submitted as outlined above.

1.8 ELECTRICAL INSTALLATIONS

A. All materials and labor called for, specified in Division 16 of the specifications, and or shown on the electrical drawings furnished under this contract shall be provided under Division 16 unless called for otherwise in the Division 16 documents. The word “provide” as used in the Division 16 documents, shall mean to furnish, install, connect up, complete with all accessories ready for operation and warranted.
B. Coordinate electrical equipment and materials installation with other building components. Fully coordinate work with that of other trades. Furnish information in writing that is needed for the coordination of clearances, etc., with the work of others, and such information shall be given in a timely fashion so as not to impede the progress of two or more trades. Confer and resolve the conflict immediately. If so directed by the A/E, prepare composite drawings to resolve any space or clearance conflict.
C. Verify all dimensions by field measurements.
D. Arrange for chases, slots, and openings in other building components to allow for electrical installations.
E. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.

F. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
G. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.
H. Where mounting heights are not detailed or dimensioned, the exact location shall be determined by the A/E, install electrical services and overhead equipment to provide the code and/or utility requirements.
I. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
J. Coordinate the installation of electrical materials and equipment above ceilings with suspension systems, mechanical equipment and systems, and structural components.
K. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
L. Attention is directed to areas and items indicated on the drawings by the notations "HOLD", "N.I.C.", "BY OTHERS" and words of similar intent. The work indicated in these areas is shown for information and continuity only. Work or items furnished and installed in these areas solely for the convenience of this Contractor or others, without prior written approval of the Owner, shall be removed at the option of the Owner and at the Contractor's expense.
M. Provide all required staging and scaffolding for all the work under this section.

1.9 ALTERATION WORK

A. Maintain continuity of service in areas where occupancy is to be maintained during alterations. If it becomes necessary to disconnect or interrupt service, obtain written consent of the Owner, and only disconnect service at the convenience of, and with the consent of the Owner. A copy of the written request for a shutdown shall be forwarded to the A/E.

1.10 CUTTING AND PATCHING

A. Cutting and patching of electrical equipment, components, and materials specified under Division 16 (conduit, sleeves, equipment, etc.) shall be performed by Electrical Contractor.
B. Refer to the Conditions of the Contract (General and Supplementary) and Division 1 Section: "Cutting and Patching" for definitions, requirements, and procedures.
C. Cutting and patching of existing structures (thru walls, floors, ceilings, etc.) to accommodate equipment, components, and materials of all Contractors, including Mechanical and Electrical Contractors, shall be performed by General Contractor and/or his designated Subcontractor.
D. Cutting and patching of new structures (thru walls, floors, ceilings, etc.) to accommodate installation of ill-timed work or removal and replacement of defective work or work not conforming to requirements of Contract Documents, shall be performed by General Contractor and/or his designated Subcontractor and costs shall be back charged to appropriate trade Contractor.
E. Do not endanger or damage installed work through procedures and processes of cutting and patching.
F. Arrange for repairs required to restore other work, because of damage caused as a result of electrical installations.
G. Arrange to have ducts, raceways, conduit, panelboards, boxes, and such other pertinent parts, set in place ahead of construction work so that they will be built-in with structures and eliminate need for cutting and patching. Failure to conform to this paragraph will require that this Contractor perform any cutting and patching required for his work at his expense. Cutting shall be neatly finished to match adjoining work in a manner acceptable to the A/E. Cutting and patching shall not affect the fire rating of walls or structural parts. Cutting and patching required to correct work, due to error or negligence of the Contractor, or to defects in his material or workmanship, shall be corrected at no additional cost to the Owner. Patching shall meet or exceed quality of adjacent surfaces. Cutting must be accomplished as not to weaken adjacent structural members and must be approved by the Structural Engineer before proceeding.

H. Perform cutting, fitting, and patching of electrical equipment and material required to:
   1. Uncover work to provide for installation of ill-timed work.
   2. Remove and replace defective work.
   3. Remove and replace work not conforming to requirements of the contract documents.
   4. Remove samples of installed work as specified for testing.
   5. Install equipment and materials in existing structures.
   6. Upon written instructions from the A/E, uncover and restore work to provide for A/E observation of concealed work.

I. Cut, remove and legally dispose of selected electrical equipment, components and materials as indicated, including, but not limited to, removal of electrical items indicated to be removed and items made obsolete by the work.

J. Protect the structure, furnishing, finishes, and adjacent materials not indicated or scheduled to be removed. Protect the electrical work and the work of others in a manner best suited to the particular case. Correct any damage done to any work at no additional cost.

K. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

L. Locate, identify, and protect electrical services passing through areas that are to under-go remodeling or demolition. Electrical services serving other areas required to be maintained, and transit services must be interrupted, provide temporary services for the affected areas and notify the Owner prior to changeover.

1.11 SUBMITTALS

A. Within fifteen (15) business days after the date of notice to proceed and before purchasing any materials or equipment, submit for approval a complete list, in six (6) copies, of all materials to be incorporated in the work.

B. Shop drawings/manufacturer's cuts are required for:
   1. Wire & Cable.
   2. Panelboards.
   3. Transformers.
   4. Disconnect Switches.
   5. Fire Alarm System.
   6. Wiring Devices and Plates.
   7. Fire Stopping Materials.
   8. Seismic Restraint Components.

C. After the list has been processed, submit complete shop drawings of all equipment. These shop drawings submittals shall be submitted within thirty days after the processing date of the original submittal.

D. All submittals shall be complete and submitted electronically to all applicable parties. No consideration will be given to partial submittals except with prior approval. No consideration will be given to faxed submittals.

E. Explanation of Shop Drawing Stamp:
   1. Approved: indicates that we have not found any reason why this item should not be acceptable within the intent of the documents.
   2. Approved with Comments: indicates that we have found questionable components which, if corrected or otherwise explained, make the product acceptable.
   3. Resubmit for Final Review: indicates that this item should be resubmitted for approval before further processing.
   4. Does Not Conform: indicates that the item will not meet the intent of the Contract.

F. No shop drawing stamp or note shall constitute an order to fabricate or ship. Such notification can only be performed by the Project Manager for construction, the Contractor scheduling his own work, or the Owner.

G. Submittal of shop drawings, product data, will be reviewed only when submitted by the Contractor. Data submitted from Sub-contractors and material suppliers directly to the A/E will not be processed.

H. If shop drawing is not in compliance after two submissions, a third submission for the same manufacturer will not be considered for review.
I. Check shop drawings and other submittals to assure compliance with contract documents before submittal to A/E.
J. Review of shop drawings is final and no further changes shall be considered without written application. Shop drawing review does not apply to quantities, dimensions, nor relieve this Contractor of his responsibility for furnishing materials or performing his work in full compliance with these contract drawings and specifications. Review of these shop drawings shall not be considered a guarantee of the measurements of this building or the conditions encountered.
K. General requirements for the substitution of equipment and submittal of shop drawings as follows. If apparatus, systems or materials are substituted for those specified, and such substitution necessitates changes in, or additional connections, wiring, supports, or construction, it shall be provided by this Contractor at no additional cost to the Owner. This Contractor shall assume all cost and entire responsibility thereof. The approval of substituted equipment does not relieve the contractor of his/her responsibility of shop drawing errors related to details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the Specifications, and/or job conditions as they exist. It is the contractor's responsibility to submit only those items that meet the specified apparatus, systems and material. Should any non-conformance code items be installed, they shall be replaced by this Contractor at no additional cost to the Owner. The construction means and methods used in the project shall be reviewed and approved through the local building department or a deputy inspector to insure compliance with the current codes, project specifications and general building practices.
L. Coordination drawings shall be submitted and shall show all HVAC, Electrical, Plumbing and Fire Protection systems superimposed in order to identify conflicts and ensure inter-coordination of all trades. Coordination drawings shall be initiated under this Section of the Specifications. It is this Contractors responsibility for preparation of project coordination drawings showing the installation of all electrical equipment, switchgear, motor control centers, panelboards, transformers, transfer switches, disconnect switches, enclosed circuit breakers, conduits, outlets, switches and accessories to be provided under this Section of the Specifications. These drawings shall be prepared at not less than 3/8 in. = 1 ft. scale, and shall show building room layouts, structural elements, ductwork and lighting layouts of function. A reproducible copy of each drawing prepared shall then be submitted to the Mechanical, Plumbing and Sprinkler Contractors, who shall be responsible to coordinate his equipment and systems and shall show these on the drawings submitted. After this Contractor has fulfilled his obligation, he shall notify all other Contractors. After each drawing has been coordinated between trades, each trade shall sign each drawing, indicating acceptance of the installation. This Contractor shall then print the coordination original and these prints submitted through the General Contractor to the architect for review and comment, similar to shop drawings. Comments made on these drawings shall result in a correction and re-submittal of the drawings. A Subcontractor who fails to promptly review and incorporate his work on the drawings shall assume full responsibility of any installation conflicts affecting his work and of any schedule ramifications. Review of coordination drawings shall not diminish responsibility under this Contract for final coordination of installation and maintenance clearances of all systems and equipment with Architectural, Structural, Mechanical, and Electrical Contractors.

1.12 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Refer to the Conditions of the Contract (General and Supplementary) and Division 1 for definitions, requirements, and procedures.
B. If materials of equipment are substituted for specified items that alter the systems shown or its physical characteristics, or which have different operating characteristics, clearly note the alterations or differences and call it to the attention of the A/E. Under no circumstances shall substitutions be made unless identical material or equipment has been successfully operated for at least three consecutive years.
C. All substitution made by the Contractor shall require the Contractor to fully coordinate the substitution with other trades. The Contractor must make any modifications required by the substitution at no additional cost to the Owner. In addition the Contractor must notify the A/E of any changes required

and obtain approval for the changes. The review of the shop drawings by the A/E shall not relieve the Contractor from his responsibility as set forth in this specification.

1.13 NAMEPLATE DATA

A. Provide permanent operational data nameplate on each item of power operated equipment, conduits with pull string, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in a readily accessible location.

1.14 DELIVERY STORAGE AND HANDLING

A. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.
B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage. All devices shall be stored in a locked room. Assume responsibility for the devices until the date of final inspection.
C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.15 RECORD DOCUMENTS

A. As work progresses and for the duration of Contract, maintain a complete and separate set of prints of Contract Drawings at job site at all times. Record work completed and all changes from original Contract Drawings clearly and accurately including work installed as a modification or addition to the original design. Work shall be updated on a weekly basis and shall be made available for review by Architect. Failure to perform this work shall be reason for withholding requisition payments. In addition, take photographs of all concealed equipment in gypsum board ceilings, shafts, and other concealed, inaccessible work. At completion of work, make copies of photographs with written explanation on back. These shall become part of Record Documents.
B. At completion of work prepare a complete set of Record As-Built Drawings in AutoCAD, Computer Aided Drafting (CAD) software, showing all systems as actually installed, including all fire alarm and electrical circuitry. The Record As-Built Drawings computer files shall be made available to the Architect, Engineer and Owner prior to final payment.
C. The Architect will not certify the accuracy of the Record Drawings. This is the sole responsibility of the Electrical Contractor.
D. This trade shall submit the record set for approval by the Fire and Building Departments in a form acceptable to the departments, when required by the jurisdiction.
E. Drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

1.16 WARRANTIES

A. Refer to the Conditions of the Contract (General and Supplementary) and Division 1 for definitions, requirements, and procedures.
B. All work and equipment furnished under this Section shall be guaranteed free from defects in workmanship or materials for a period of one (1) year, unless specifically noted otherwise for a particular system, from the date of final acceptance of the systems as set forth in this Contract. The Subcontractor shall replace any defective work developing during this period, unless such defects are clearly the result of misuse of equipment by persons not under the control of the Subcontractor, without cost to the Owner. Where such defective work results in damage to work of other Sections, all such

work shall be restored to its original condition by mechanics skilled in the affected trade, at the expense of the Subcontractor. The Subcontractor shall submit a separate written guarantee stipulating the aforesaid conditions.

C. Prior to or at the time of Substantial Completion for the work and during administrative close-out of the project, submit one (1) copy of all specified warranties and guarantees to the Architect for review, approval and subsequent transmittal to the Owner.
D. Warranties and guarantees, including those specified in excess of the general one (1) year guarantee, shall be complete for all specific materials, systems, sub-systems, equipment, appliances and products specified and required by the Contract Document.
E. Warranties and guarantees shall clearly define what is to be guaranteed; the extent, terms, conditions, time and effective dates.
F. Copies of the same warranties and guarantees shall be included in the “Operating and Maintenance Manual” as specified herein.

1.17 CLEANING

A. Refer to the Conditions of the Contract (General and Supplementary) and Division 1 for definitions, requirements, and procedures.
B. Upon completion of work, the Contractor shall clean, polish and leave bright, fixtures and lamps, and shall remove dust, dirt, debris and loose plaster from panelboards, controls, and switchboards. Unused openings in pull boxes, junction boxes, equipment and raceways shall be capped or closed by an approved means. Replace all inoperative lamps.

1.18 DEFINITION OF TERMS

A. "This Contractor" or "E.C." specifically means, the Electrical Contractor working under this section of the specifications.
B. "Concealed" means hidden, in chases, furred spaces, walls, above ceilings or enclosed in construction.
C. "Exposed" means visible in sight or not installed "concealed" as defined above.
D. "Approved Equal" means any equipment or material which is approved by the Engineer and equal in quality, durability, appearance, strength, design and performance to the equipment or material originally specified.
E. "Conduit" shall mean all conduit including fittings, joints, hangers and supports.
F. "Furnish" shall mean to purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the electrical work.
G. "Install" shall mean to perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the electrical work.
H. "Provide" shall mean to furnish and install.

1.19 QUALITY ASSURANCE

A. Obtain services of manufacturer's representatives of electrical equipment, during erection and construction of their respective equipment to insure proper installation of same.
B. A letter is required from each system manufacturer's representative certifying to the A/E that requirements have been checked and are properly installed and operating.

1.20 PERFORMANCE TESTS - ELECTRICAL

A. Test and adjust the electrical systems and equipment during the progress of the work.
B. Upon completion of work and after preliminary tests to assure that all systems are complete and in proper working order, arrange with the A/E to conduct performance tests of the electrical systems. These tests may be witnessed by the A/E prior to acceptance of systems and shall be arranged for the purpose of demonstrating compliance with contract documents. During this period,

visually inspect all electrical equipment. Check voltages to assure that all transformer taps are properly set.

C. General operating tests shall be performed under as near design conditions as possible, for a period of not less than one (1) hour for each system, and shall demonstrate that all equipment is functioning in accordance with specifications. Furnish all instruments, ladders, test equipment and personnel required for tests. Any equipment or systems found by test to be deficient or unsatisfactory shall be replaced and tests repeated as often as necessary to assure compliance with contract documents.
D. Test all feeders, sub-feeders and all branch wiring for amperage, voltage, phase balance, phase sequence of A,B,C and insulation resistance, then submit the results of this test to the A/E neatly typed in triplicate for review. This test may be conducted at any time up to, through and including, the guarantee period if requested by the A/E, at no additional cost to the Owner.
E. Phase balance the complete electrical system, phase balance all panels as near as loads will permit under normal working conditions.
F. Test all ground conductors for current flow, as near design operating conditions as possible. If any measured current exceeds one (1) ampere, determine and correct the cause. Also, if measured resistance is greater than 5 ohms indoor or 10 ohms outdoor, determine and correct the cause.
G. During the progress or completion of the work it shall be subject to the inspection of the Owner and to such other inspectors, as may have jurisdiction, including those of the Electric Company, Fire Department and the Telephone Company.
H. The Contractor shall be responsible for correct voltages, tap settings, trip settings and correct phasing on all equipment. Secondary voltages shall be measured at the line side of the main breakers with the breakers in an open position, at panelboards, and at such other location on the distribution systems and branch circuits as directed by the Engineer.
I. At completion of the work, Contractor shall submit to the Owner's representative in writing a statement stating: (1) that the work is complete; (2) that the entire installation is in accordance with the drawings and specifications; (3) that preliminary tests have been made; and (4) that the work is ready for final inspection and test.
J. A final inspection of the installation to determine compliance with the drawings and specifications will be made by the Owner's representative. Work will be checked for quality of materials, quality of workmanship, proper installation and finished appearance. The electrical contractor shall provide the services of the project electrical foreman for inspection purposes. The foreman shall remove and reinstall wiring devices, junction box covers, panelboard trims, switchboard covers, terminal box covers, ceiling tiles, lighting fixtures, etc. as required to facilitate any inspections required by the Owner's representative.
K. The Contractor shall arrange and conduct operating tests on all equipment in the presence of the Owner's representative. The components parts of systems and the various systems shall be demonstrated to operate in accordance with the requirements and intent of this specification. Any non-complying or defective materials or workmanship disclosed as a result of the inspection and tests shall be corrected promptly by the Contractor, and the tests repeated as often as necessary until approved and accepted by the Owner's representative.
L. The Contractor shall visit the site to acquaint himself with existing conditions. No extra compensation will be paid for failure to comply with this paragraph.
M. The Electrical Contractor shall provide supervision, labor, materials, tools, test equipment, and all other equipment or services and expenses required to test, adjust, set, calibrate, and operationally check work and components of the electrical systems and circuitry throughout this section.
N. The electrical contractor shall pay for all tests including expences incident to retests occasioned by defects and failures of equipment to meet specifications at no additional cost to the owner.
O. Any defects or deficiencies discovered in any of the electrical work shall be corrected at no cost to the owner.
P. All testing shall be compatible with the manufacturer’s installation instructions.

1.21 SEISMIC RESTRAINT

A. It is the intent of this seismic specification to keep all electrical building system components in place during a seismic event.

B. All electrical systems must be installed in strict accordance with seismic codes, component manufacturer's and building construction standards. Whenever a Conflict occurs between the manufacturer's or construction standards, the most stringent shall apply.
C. This contractor shall engage a professional structural engineer registered in the jurisdiction of this project to review the entire installation to determine all seismic restraint requirements and methods. Contractor shall submit a report outlining the structural engineer's review as well as seismic restraint shop drawings and supporting calculations prepared by the professional structural engineer for review by the Architect.
D. Seismic restraints shall be designed in accordance with seismic force levels as detailed in the applicable building code.

1.22 TEMPORARY LIGHT AND POWER

A. Under this Section of the specifications, this Contractor shall provide temporary electric service, sized suitable for construction for each trade. This contractor shall provide all material and labor for temporary electrical service per the local power company's requirements and standards with all necessary panelboards, disconnect switches, transformers, conduit, wiring, etc. as required. This contractor shall pay all associated costs, up front.
B. Where temporary electrical service cannot be obtained from the local power company, this contractor shall provide a temporary, on-site, electric generator with all necessary panelboards, disconnect switches, transformers, conduit, wiring, etc. as required. The fuel used for the generator shall be provided and paid for by this Contractor.
C. This contractor shall provide a distribution system with circuits for receptacles and lighting as required for construction. This contractor shall maintain the temporary electrical system during construction and remove the system when construction is complete.
D. Under this section of the specifications, this Contractor shall provide and maintain temporary lighting based on using not less than one 100-watt lamp for each 100 square feet of building floor area and one duplex GFCI receptacle for each 200 square feet of building floor area. Where higher lighting intensities are required by Federal or State laws or otherwise specified, the above specified wattage shall be increased to provide the increase intensities.
E. This contactor shall provide temporary power and telephone services from the local telephone company for site trailers, fax machines, computers, etc., per the general contractor's direction.
F. The service shall incorporate ground fault protection and comply with NEC Article 527 and OSHA requirements.

1.23 PERMITS

A. Obtain all required electrical permits and pay all fees for same.
B. Provide to Engineer, in duplicate, a certificate of final inspection from the authority having jurisdiction for the electrical and systems.

1.24 OPERATING, INSTRUCTION, AND MAINTAINANCE MANUALS

A. Refer to Section 01700 – CONTRACT CLOSEOUT for submittal procedures pertaining to operating and maintenance manuals.
B. Each copy of the approved operating and maintenance manual shall contain copies of approved shop drawings, equipment literature, cuts, bulletins, details, equipment and engineering data sheets and typewritten instructions relative to the care and maintenance for the operation of the equipment, all properly indexed.

1.25 BIDDERS REPRESENTATION

A. By the act of submitting a bid for the proposed contract, the Bidder represents that:

1. The Bidder and all subcontractors the Bidder intends to use have carefully and thoroughly reviewed the drawings, specifications and other construction contract documents and have found them complete and free from ambiguities and sufficient for the purpose intended; further that,
2. The Bidder and workmen, employees and subcontractors the Bidder intends to use are skilled and experienced in the type of construction represented by the construction contract documents bid upon; further that,
3. Neither the Bidder nor any of the Bidder's employees, agents, intended suppliers or subcontractors have relied upon any verbal representations, allegedly authorized or unauthorized from the Owner, or the Owner's employees or agents including architects, engineers or consultants, in assembling the bid figure; and further that,
4. The bid figure is based solely upon the construction contract documents and properly issued written addenda and not upon any other written representation.

1.26 UTILITY COMPANY & AGENCY COORDINATION

A. This section includes, but is not limited to coordination with the following utilities, agencies and authorities having jurisdiction:
   1. Power Company: This Contractor shall coordinate with the local utility power company and provide all material & labor required to comply with the utility power company's requirements and standards, prior to ordering any electrical equipment, such as, switchgear, panels, transformers, disconnect switches, SPD, etc. This Contractor shall confirm metering sequence (hot or cold) and make the appropriate provisions and/or changes for the utility companies approved metering sequence arrangement. Notify Engineer of discrepancies between the plans and the local utility company's standards. No extra compensation will be given for corrections required to this Contractor for failure to coordinate with the utility company, but corrections shall be made. All A.I.C. ratings, grounding, bonding, concrete pads & curbs, protective bollards, raceways, ductbank, manholes, etc., shall be in accordance with the utility company's standards.

   2. Local Fire Marshal: This contractor shall verify with the local fire alarm official, the type of master-box or municipal connection required for this project. This contractor shall provide all material & labor to comply with the local municipality. Notify Engineer of discrepancies between the plans and the municipality's standards. No extra compensation will be given for corrections required for failure to coordinate with the municipality, but corrections shall be made.
   3. Electrical Inspector: Review plans and specifications with the local electrical and/or wiring inspector(s). Obtain and pay for all permits.
   4. Building Inspector: Review plans and specifications with the local building inspector, if not done so by the General Contractor.
   5. OSHA Representative: Review plans and specifications with the local OSHA representative, if not done so by the General Contractor.
   6. Dig Safe: This contractor shall notify and coordinate with Dig Safe prior to any excavation; digging; trenching; grading; tunneling; augering; boring; drilling; pile driving; plowing-in or pulling-in pipe, cable, wire, conduit, or other sub-structure; backfilling; demolition; and blasting related to this Contractor.
B. The Electrical Contractor shall pay for all permits, inspections, labor, material and fees associated with the various Utility Companies coordination requirements mentioned in this section and for this Contractor's work under this project.
C. The Electrical Contractor shall carry a minimum of $15,000 of utility expenses. In the case the expenses are less than the carried expense, the difference will be credited to the owner. In the case the utility charges are more than the carried expense, the remaining payment shall be coordinated between the Electrical Contractor, General Contractor and Owner.
D. HVAC, Plumbing, Fire Protection, and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structural and other trades and to meet Architectural requirements.

E. In all spaces, prior to installation of visible material and equipment, including access panels, review Architectural Drawings for exact locations and where not definitely indicated, request information from Architect. Where the electrical work shall interfere with the work of other trades, assist in working out the space conditions to make satisfactory adjustments before installation. Without extra cost to the Owners, make reasonable modifications to the work as required by normal structural interferences. Pay the General Contractor for additional openings, or relocating and/or enlarging existing openings through concrete floors, walls, beams and roof required for any work which was not properly coordinated. Maintain maximum headroom at all locations. All piping, duct, conduit, and associated components to be as tight to underside of structure as possible.
F. If any electrical work has been installed before coordination with other trades so as to cause interference with the work of such trades, all necessary adjustments and corrections shall be made by the trades involved without extra cost to the Owners.
G. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Architect and Engineer for review and approval.

PART 2 – PRODUCTS

2.1 CONDUIT

A. Minimum Size: ¾-inch, unless otherwise specified.
B. Underground Installations:
   1. More than Five Feet from Foundation Wall: Use thick wall nonmetallic conduit concrete encased.
   2. Within Five Feet from Foundation Wall: Use rigid steel conduit concrete encased.
   3. In or Under Slab on Grade: Use plastic coated conduit.
   4. Minimum Size: 1-inch.
C. Outdoor Locations, Above Grade: Use rigid steel conduit.
D. In Slab Above Grade:
   1. Use rigid steel conduit.
   2. Maximum Size Conduit in Slab: ¾ inch (19 mm); ½ inch (13 mm) for conduits crossing each other.
E. Wet and Damp Locations: Use rigid aluminum conduit.
F. Dry Locations:
   1. Concealed and in Cable-Tray: Use metal clad (MC) cable (see Division 1)
   2. Exposed: (Unfinished or utility spaces) Use electrical metallic tubing.
G. Metal conduit: Rigid Steel Conduit shall comply with ANSI C80.1 and be heavy wall zinc coated steel. Rigid Aluminum Conduit shall comply with ANSI C80.5. Intermediate Metal Conduit (IMC) shall be rigid steel. Fittings and Conduit Bodies shall comply with ANSI/NEMA FB 1 and material to match conduit. Acceptable manufacturers are Western Tube and Conduit Company, Allied Tube and Conduit Company and Triangle Wire and Cable, Inc.
H. Flexible metal conduit shall be interlocked aluminum contruction. Fittings shall comply with ANSI/NEMA FB 1. Acceptable manufacturers are AFC Cable Systems, Electri-Flex Company and Eastern Flexible Conduit Technologies. All flexible conduits shall include a grounding conductor.
I. Electrical metallic tubing (EMT) shall comply with ANSI C80.3; galvanized zinc coated steel tubing. Fittings and Conduit Bodies shall comply with ANSI/NEMA FB 1; steel, compression or set screw type. Acceptable manufacturers are Western Tube and Conduit Company, Allied Tube and Conduit Company and Triangle Wire and Cable, Inc.
J. Nonmetal conduit shall comply with NEMA TC 2; Schedule 40 PVC, or as indicated on plans. Fittings and Conduit Bodies shall comply with NEMA TC 3. Acceptable manufacturers are Carlon or approved equal.
K. Flexible nonmetallic conduit (Sealtite) shall be UL and CSA listed for purpose specified and shown. Acceptable manufacturers are Carlon or approved equal.
L. Install conduit in accordance with NECA "Standard of Installation." Install nonmetallic conduit in accordance with manufacturer's instructions.
M. Arrange supports to prevent misalignment during wiring installation. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25

percent additional conduits. Fasten conduit supports to building structure and surfaces under provisions of Division 1. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports. Do not attach conduit to ceiling support wires.

N. Arrange conduit to maintain headroom and present neat appearance. Route exposed conduit parallel and perpendicular to walls. Route conduit installed above accessible ceilings parallel and perpendicular to walls. Route conduit in and under slab from point-to-point. Do not cross conduits in slab.
O. Maintain adequate clearance between conduit and piping. Maintain 12-inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).
P. Cut conduit square using saw or pipe cutter; de-burr cut ends. Bring conduit to shoulder of fittings; fasten securely. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
Q. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2 inch (50 mm) size.
R. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control and expansion joints. All expansion and deflection fittings shall have a ground strap. Provide suitable pull string in each empty conduit except sleeves and nipples. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
S. Ground and bond conduit under provisions of NEC 250.

2.2 DUCT BANK

A. Verify that field measurements are as indicated. Verify routing and termination locations of duct bank prior to excavation for rough-in. Verify locations of manholes prior to excavating for installation. Duct bank routing is shown in approximate locations unless dimensions are indicated. Route as required to complete duct system. Manhole locations are shown in approximate locations unless dimensions are indicated. Locate as required to complete duct bank system.
B. Underground Warning Tape: Provide 3-inch wide plastic tape 12” below finished grade, colored yellow with suitable warning legend describing buried electrical lines; Model #47586 as manufactured by Seton or equal.
C. Install duct to locate top of duct bank at 30” below finished grade or at depths as indicated on drawings. Install duct with minimum slope of 4-inches per 100-feet. Slope duct away from building entrances.
D. Provide suitable fittings to accommodate expansion and deflection where required. Terminate duct at manhole entries using end bell. Stagger duct joints vertically in concrete encasement 6 inches minimum. Use suitable separators and chairs installed not greater than 4 feet (1200 mm) on centers. Band ducts together before backfilling and placing concrete. Securely anchor duct to prevent movement during concrete placement.
E. Place concrete as required and under provisions of Division 3. Use mineral pigment to color concrete red. Provide minimum 3-inch concrete cover at bottom, top, and sides of duct bank. Provide two No. 4 steel reinforcing bars in concrete ductbank under paved areas. Connect to existing concrete encasement using dowels. Connect to manhole wall using dowels.
F. Provide suitable pull string in each empty duct except sleeves and nipples. Swab duct. Use suitable caps to protect installed duct against entrance of dirt and moisture.
G. Backfill trenches as required and under provisions of Division 2. Interface installation of underground warning tape with backfilling specified in Division 2. Install warning tape 12-inches below finished surface.

2.3 BUILDING WIRE & CABLE

A. Building Wire and Cable shall be copper with 600V insulation rated at 75°C minimum, Type XHHW insulation for feeders and branch circuits larger than #3 AWG; Type THHN/THWN insulation for feeders and branch circuits #4 AWG and smaller.

B. Conductors shall be of soft drawn 98% minimum conductivity properly refined copper, solid construction where No. 10 AWG and smaller, stranded construction where No. 8 AWG and larger.
C. Exterior of wires shall bear repetitive markings along their entire length indicating conductor size, insulation type and voltage rating.
D. Exterior of wires shall be color coded, so as to indicate a clear differentiation between each phase and between each phase and neutral. In all cases, grounded neutral wires and cables shall be identified by the colors “white” or “gray”. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made. Colored tape shall be applied for a distance of 6 inches along the wires and cables, or along their entire extensions beyond raceway ends, whichever is less.
E. Final connections to motors shall be made with 18” of neoprene sheathed flexible conduit.
F. Minimum branch circuit conductor size shall be No. 12 AWG installed in conduit. Motor control circuit wiring shall be minimum No. 14 AWG installed in conduit.
G. Fire alarm and security system wiring shall be No. 16 twisted non-shielded pairs for alarm and trouble circuits and a minimum of #14 AWG for device power, control and alarm annunciation circuits. Fire alarm system riser circuits shall be 2-hour rated, CI type (circuit integrity) cable per NFPA 72 and NEC 760.
H. Other wires and cables required for the various systems described elsewhere in this section of the Specifications shall be as specified herein, as shown on the Contract Drawings, or as recommended by the manufacturer of the specific equipment for which they are used, all installed in conduit.
I. Metal clad sheathed cable NFPA 70, type MC may be used for branch circuitry where shown and where run concealed and not subject to physical damage. All branch circuits shall be run in conduit from the panelboard to the first outlet. All type MC cable used shall contain a full size insulated ground conductor. All conductors shall be copper. All type MC cable insulation used shall have voltage rating of 600 volts, shall have a temperature rating of 75° C, and shall be thermoplastic material. Armor material shall be steel and armor design shall be interlocked metal tape. Fire alarm rated MC cable may be used for fire alarm work where concealed and approved by the Authority Having Jurisdiction.
J. Metal-Clad cable (Type MC) for circuits supplying computer equipment, electronic discharge lighting and other sensitive electronic equipment shall consist of 90°C THHN copper conductors with insulated ground and oversized neutral conductor (or one full size neutral conductor for each phase conductor). Cable shall be U.L. listed/labeled, and shall meet the requirements of NEC Art. 334 and 675.
K. Use armored cable (AFC Type HCF-90 or equal) for branch circuits and feeders in areas of patient care in hospitals, nursing homes and medical centers, medical office buildings and nurses’ office areas of schools. This cable shall consist of 90°C THHN copper conductors with combined armor/bond wire (equipment) plus a green insulated ground (redundant). Use insulated bushings. Cable shall be U.L. listed/labeled, and shall meet the requirements of NEC Art. 333, 517 and 645.
L. Use armored cable (AFC Type HCF-90 or equal) for branch circuits and feeders in all buildings in the following areas; data processing systems, places of assembly, under raised floors, above suspended ceilings and in other environmental air-handling spaces. This cable shall consist of 90°C THHN copper conductors with combined armor/bond wire (equipment) plus a green insulated ground (redundant). Use insulated bushings. Cable shall be U.L. listed/labeled, and shall meet the requirements of NEC Art. 333, 517 and 645.
M. Mineral-insulated metal-sheathed fire-resistive cables, type MI, shall consist of a factory assembly of one or more solid copper conductors insulated with highly-compressed magnesium oxide and enclosed in a seamless, liquid and gas-tight continuous copper sheath. Cables shall be rated for 600 volts. Cable shall comply with Article 330 of the National Electrical Code. Cables shall be classified by Underwriters Laboratories, Inc. as having a 2-hour fire resistive rating. Cable terminations shall be made with UL listed mineral-insulated cable fittings. Installation of MI cables shall be in accordance with the manufacturer’s instructions. Cables shall be as manufactured by Pyrotenax USA, Inc., or approved equal.
N. Wiring materials except MI cable shall be manufactured by Triangle, Essex, General Cable, AFC, Southwire or equal.
O. Concealed Dry Interior Locations: Use only building wire Type THHN/THWN or XHHW insulation in raceway, or metal clad cable where concealed and code acceptable.

P. Exposed Dry Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway.
Q. Above Accessible Ceilings: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway or metal clad cable where code acceptable.
R. Wet or Damp Interior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway.
S. Exterior Locations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway.
T. Underground Installations: Use only building wire, Type THHN/THWN or XHHW insulation, in raceway.
U. Wiring methods, in general, are as follows:
    1. Galvanized rigid steel conduit shall be used for telephone system sleeves for main cable runs between floors, closets, etc. and for sweeps, bends, etc. in ductbanks and as specifically noted on the plans. EMT shall be used generally for exposed circuiting in unfinished spaces. Metal clad cable (type MC) may be used for branch circuiting and fire alarm rated MC cable for fire alarm circuiting where run concealed and where code acceptable.
    2. To prevent transmittal of vibration to conduit, connections to any vibration producing equipment (i.e. transformers, motors, etc.) shall be terminated by 18 inches of flexible metal conduit. Where flexible connections are exposed to grease and oil, liquid-tight flexible metal conduit shall be used.
    3. In general, no splices or joints shall be permitted in either feeders or branches except at outlets or accessible junction boxes. Splices in wire #8 AWG and smaller shall be pigtail type, made mechanically tight. All conduit systems shall be complete.
    4. Raceway, boxes, etc., run on walls in wet areas which are subject to being washed down, shall be mounted on the walls with 1/4" stand-offs. All boxes shall be cast type.
V. Route wire and cable as required to meet the Project Conditions. Install cable in accordance with the NECA "Standard of Installation." Use solid conductor for feeders and branch circuits 10 AWG and smaller. Use stranded conductors for control circuits. Use conductor not smaller than 12 AWG for power and lighting circuits. Use conductor not smaller than 16 AWG for control circuits. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (25 m). Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet (160 m). Pull all conductors into raceway at same time. Use suitable wire pulling lubricant for building wire 4 AWG and larger. Protect exposed cable from damage.
W. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure or ceiling suspension system, cables that are not part of the ceiling system cannot be supported from ceiling supports. Do not rest cable on ceiling panels. Use suitable cable fittings and connectors. Neatly train and lace wiring inside boxes, equipment, and panelboards.
X. Clean conductor surfaces before installing lugs and connectors. Make splices, taps, and terminations to carry full ampacities of conductors with no perceptible temperature rise. Use suitable reducing connectors or mechanical connector adapters for connecting aluminum conductors to copper conductors. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape un-insulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller. Identify and color code wire and cable. Identify each conductor with its circuit number or other designation indicated.

2.4 BOXES

A. Outlet Boxes:
    1. Each outlet in wiring or raceway systems shall be provided with an outlet box to suit conditions encountered. Boxes installed in normally wet locations shall be of cast-metal type having hubs. Concealed boxes shall be cadmium plated or zinc coated sheet metal type. Old work boxes with Madison clamps are not allowed in new construction.
    2. Each box shall have sufficient volume to accommodate number of conductors in accordance with requirements of NFPA 70. Boxes shall not be less than 1-1/2” deep unless shallower boxes are required by structural conditions and are specifically approved by Architect. Ceiling and

bracket outlet boxes shall not be less than 4" octagonal except that smaller boxes may be used where required by particular fixture to be installed. Flush or recessed fixtures shall be provided with separate junction boxes when required by fixture terminal temperature requirements. Switch and receptacle boxes shall be 4" square or of comparable volume. Luminaire and equipment supporting boxes shall be rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.

3. Provide metallic boxes rated for 2-hour, fire-rated walls with gasket to reduce noise-transmission in all fire-rated walls. A minimum horizontal distance of 24-inches shall separate metallic boxes located on opposite sides of fire walls. This minimum horizontal spacing may be reduced using UL classified wall opening protective materials, commonly known as "putty pads" or "insert pads" pending written approval from the local authority having jurisdiction (AHJ). Refer to Architect's plans for all wall types prior to bid and any related work that will require 2-hour fire ratings.
4. All boxes installed in demising walls separating tenants, electrical room walls, mechanical room walls, conference room walls, nurse's office walls, and other room walls deemed private by the Owner shall be provided with gasket to reduce noise-transmission.
5. All boxes installed in exterior walls shall be provided with appropriate caulking and gaskets to seal off and prevent air leakage. Follow caulking and gasket manufacturer's installation guidelines to ensure correct and effective installation.
6. Acceptable Manufacturers:
    a. Appleton
    b. Crouse Hinds
    c. Steel City
    d. RACO

B. Pull and Junction Boxes: Where necessary to terminate, tap off, or redirect multiple raceway runs or to facilitate conductor installation, furnish and install appropriately designed boxes. Boxes shall be fabricated from code gauge steel assembled with corrosion resistant machine screws. Box size shall be as required by Code. Where intermediate cable supports are necessary because of box dimensions, provide insulated removable core brackets to support conductors. Junction boxes are to be equipped with barriers to separate circuits. Where splices are to be made, boxes shall be large enough to provide ample work space. All conductors in boxes are to be clearly tagged to indicate characteristics. Boxes shall be supported independently of raceways. Junction boxes in moist or wet areas shall be galvanized type. Boxes larger than 4-inches square shall have hinged covers. Boxes larger than 12-inches in one dimension will be allowed to have screw fastened covers, if a hinged cover would not be capable of being opened a full 90 degrees due to installation location.
C. Fiberglass Handholes shall be die molded glass fiber. Cable Entrance shall be pre-cut 6-inch x 6-inch (150 mm x 150 mm) cable entrance at center bottom of each side. Cover shall be glass fiber weatherproof cover with nonskid finish.
D. Install boxes in accordance with NECA "Standard of Installation." Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
E. Set wall mounted boxes at elevations to accommodate mounting heights indicated or specified in section for outlet device. Electrical boxes are shown on drawings in approximate locations unless dimensioned. Adjust box location up to 10-feet (3m) if required to accommodate intended purpose. Orient boxes to accommodate wiring devices. Maintain headroom and present neat mechanical appearance.
F. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 7.
G. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
H. Use flush mounting outlet box in finished areas. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening. Do not install

flush mounting box back-to-back in walls; provide minimum 6-inches (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic rated walls. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness. Use stamped steel bridges to fasten flush mounting outlet box between studs. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

I. Use adjustable steel channel fasteners for hung ceiling outlet box. Do not fasten boxes to ceiling support wires. Support boxes independently of conduit. Use gang box where more than one device is mounted together. Do not use sectional box. Use gang box with plaster ring for single device outlets. Use cast outlet box in exterior locations exposed to the weather and wet locations. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations. Set floor boxes level.
J. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.
K. Adjust floor box flush with finish flooring material. Adjust flush-mounting outlets to make front flush with finished wall material. Install knockout closures in unused box openings.

2.5 WIRING DEVICES

A. Provide wiring device type plates for all wall-mounted devices. All wall plates shall be either brushed aluminum or smooth high impact nylon for all public areas as directed by the Architect. Provide galvanized steel for all Utility, Electric and Mechanical Rooms. Colors of wall plates as directed by the Architect.
B. Wiring devices standard for the project (i.e., with no specific type indicated) shall conform to the following:
    1. Visible part colors of wiring devices shall be as directed by the Architect for all public areas. Provide Ivory colored devices for all Utility, Electrical and Mechanical rooms.
    2. Exclude compact type devices.
C. Wiring device switches shall be toggle type, A.C. quiet design, specification grade, 20 amps on 120 volt circuits. Switches shall be mounted 48-inches to center line above finished floor unless noted otherwise. Equivalent 277volt, 20 amp switches shall be used where required.
D. Standard duplex convenience receptacles shall be 125volt, 20 amps, three wire (two circuit wires plus ground), “U-slot” ground NEMA configuration 5-20R, specification grade. Receptacles shall be mounted 18” to center line above finished floor unless noted otherwise. Where indicated on plans provide receptacles with ground fault current interrupters, UL Class A; 20A, 125V.
E. Non-standard convenience receptacles and special purpose power supply receptacles shall be as listed on plans.
F. Use “Hospital-Grade” receptacles in areas of patient care for all healthcare facilities as defined in the National Electrical Code and in nurses’ office areas of schools. Day-care facilities, Preschool and Kindergarten rooms & other areas indicated on the plans shall be tamper resistant type receptacles. When connected to an Essential Electrical System, all “Hospital Grade” receptacles shall be illuminated.
G. Provide ground fault circuit interrupter (GFCI), weather-resistant type receptacles in all wet and damp locations as defined by the National Electrical Code. All outdoor receptacles and where indicated on the plans shall be installed in a weatherproof while-in-use enclosures.
H. Weatherproof Receptacle Enclosures shall be NEMA 3R rated for rain-tight while-in-use, gasketed, impact resistant thermoplastic with hinged gasketed device cover.
I. Provide extension rings to bring outlet boxes flush with finished surface. Clean debris from outlet boxes. Install devices plumb and level. Install receptacles with grounding pole on top. Connect wiring device grounding terminal to branch circuit equipment grounding conductor. Use jumbo size plates for outlets installed in masonry walls. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
J. Install wall switch 48 inches above finished floor to top of handle. On position, shall be up. Install convenience receptacles 18-inches above finished floor. Install convenience receptacle 6-inches above backsplash of counter. Install dimmer switches 48 inches above finished floor to top.

K. Verify that each receptacle device is energized. Test each receptacle device for proper polarity. Test each GFCI receptacle device for proper operation.

2.6 CABINETS & ENCLOSURES

A. Cabinets shall be as follows: Boxes: Galvanized steel. Box Size: As required and/or indicated on plans. Backboard: Provide 3/4-inch thick plywood backboard for mounting terminal blocks. Paint matte white. Fronts: Steel, flush type with concealed trim clamps, door with concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel. Knockouts: As required and/or indicated on plans. Provide metal barriers to form separate compartments wiring of different systems and voltages. Provide accessory feet for free-standing equipment.
B. Hinged Cover Enclosures shall be as follows: Construction: NEMA 250, Type 1, 3R, or 4 steel enclosure, as required and/or indicated on plans. Covers: Continuous hinge, held closed by flush latch operable by key or hasp and staple for padlock. Provide interior plywood panel for mounting terminal blocks and electrical components; finish with white enamel. Enclosure Finish: Manufacturer's standard enamel.
C. Install in accordance with NECA "Standard of Installation." Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner under the provisions of Section 16190. Install cabinet fronts plumb.
D. Clean electrical parts to remove conductive and harmful materials. Remove dirt and debris from enclosure. Clean finishes and touch up damage.
E. ICS 4 - Terminal blocks for industrial control equipment and systems. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts. Provide ground bus terminal block, with each connector bonded to enclosure.
F. Provide grounding provisions for all cabinets/enclosures and bond to grounding system as required per Code.

2.7 GROUNDING & BONDING

A. Ground all systems and equipment in accordance with best industry practice, the requirements of NFPA 70 and the following:
   1. The ground bus of the main switchboard shall be connected to the main grounding electrode specified below by means of insulated conductors run in conduit.
   2. The main grounding electrode shall be an accessible point on the nearest metallic main water service pipe. Connection shall be made on the street side of the main valve utilizing a ground clamp of a type specifically manufactured for the purpose. Bonding jumpers shall be provided around the water meters and around insulating joints and/or sections.
   3. Establish a ground bonding connection from the effectively grounded structural building steel to each cold-water main entering the building. Each bonding connection shall consist of insulated conductors run in conduit.
   4. The water pipe ground shall be supplemented by an additional electrode consisting of three (3) buried 3/4" diameter by 10’-0” long copperweld ground rods spaced 10’-0” apart, and provided in sufficient quantity so as to have measured resistance to ground of not more than 10 ohms. Provide independent certification confirming this. Establish a bonding connection from the electrode consisting of green insulated conductors run in conduit and sized as indicated hereinafter for main and supply side of service bonding jumpers.
   5. Provide grounding bonds between all metallic conduits of the light and power system which enter and leave cable chambers or other non-metallic cable pulling and splicing boxes. Accomplish this by equipping the conduits with bushings of the grounding type individually cross connected.
   6. Bond metallic conduits containing grounding electrode conductors and main bonding conductors to the ground bus service enclosure and/or grounding electrode at both ends of each run utilizing grounding bushings and jumpers.

7. Provide grounding bonds for all metallic conduits of the light and power system which terminate in pits below equipment for which a ground bus is specified. Accomplish this by equipping the conduits with bushings of the grounding type connected individually to the ground bus.
8. Provide supplementary ground bonding where metallic conduits terminate at metal clad equipment (or at the metal pull box of equipment) for which a ground bus is specified. Accomplish this be equipping the conduits with bushings of the grounding type connected individually by means of jumpers to the ground bus. Exclude the jumpers where directed. This exclusion will be required where an isolated ground for electronic equipment is to be maintained.
9. Each grounding type bushing shall have the maximum ground wire accommodation available in standard manufacture for the particular conduit size. Connection to bushing shall be with wire of this maximum size.
10. Bonding conductors on the load size of the service device and equipment grounding conductors shall be sized in relation to the fuses or trip size of the overcurrent device supplying the circuit.
11. The central equipment for the fire protective alarm system and telephone system shall have its grounding terminal connected to the grounding electrode by means of a No. 6 green coded insulated conductor, run in 3/4" conduit. Utilize a ground clamp of a type specifically manufactured for the purpose.
12. Install rod electrodes per this section & in compliance with Code. Install additional rod electrodes as required to achieve specified resistance to ground. Install 4/0 AWG bare copper wire in foundation footing as required. Provide isolated grounding conductor for circuits supplying personal computers as indicated on the plans. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing. Provide a 3/4” raceway with #6 AWG ground wire from main telephone terminal board to the service ground.
13. Perform inspections and tests listed in NETA ATS, Section 7.13. Document test results in Record Documents.
14. Swimming Pools, fountains & similar installations: Refer to NEC 680 for requirements for grounding and bonding. Provide all grounding and bonding per NEC 680 and 250.
15. Grounding means shall never exceed 10 ohms when located outdoors, or 5 ohms when located indoors.
16. An acceptable means of grounding is to provide an underground 2” thick, concrete-encased electrode of either ½” diameter, electrically conductive reinforcing bar of #4/0 bare copper conductor (minimum of 20-feet in length) per NEC 250.52(A)(3).

2.8 EQUIPMENT WIRING SYSTEMS

A. Cords & Caps: Manufacturers: Hubbel, Pass & Seymour or Arrow Hart. Attachment Plug Construction: Conform to NEMA WD 1. Configuration: NEMA WD 6; match receptacle configuration at outlet provided for equipment. Cord Construction: ANSI/NFPA 70, Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
B. Motor Control Equipment: Each motor shall have a starter furnished under this Section where it is not being supplied by other sections. Wire and installed under this Section, unless otherwise noted herein or on the drawings.
   1. Connect the motor starting devices for all motors, except where otherwise specifically provided for under other sections, furnish all necessary connections between controllers and motors, in conduit and leave motors ready to start. Change connections, if necessary, to secure proper rotation of motors.
   2. Perform all the necessary wiring in connection with the motor starting and remote control equipment, where so designated, furnished under other sections. Where control or starting equipment is sent to the job as individual units, they shall be installed, wired up complete and left ready for operation under work of this section.
   3. Wiring to motor shall be in rigid conduit with watertight flexible conduit from wall to motor only.
C. Included in the general requirements for motor control equipment wiring and connections, the following specified items shall be performed:

1. Installation and connection of motor controls which will be furnished under the heating, ventilating and air conditioning section and the plumbing section.

D. Starters by This Contractor: Where starters are not provided under other sections, this Contractor shall furnish starters for motors 1/2 HP and larger and where required by the control sequence for smaller motors and shall be magnetic across the line starters with adjustable overload protection in each phase line, all in NEMA 1 enclosures. Starters shall be solid state or acceptable substitute. Combination starters shall be with fused or non-fusible disconnect as required.
   1. Magnetic starters shall have 120 volt holding circuits, integral transformers, auxiliary contacts as required by the control sequence and integral selector switches with push-to-test pilot lights. One side of each pilot light shall be connected on the load side of the motor starter.
   2. Integral transformers shall have overload protection on the secondary section and, also, the secondary neutral shall be grounded.
   3. Starters shall be as manufactured by Square D Company or General Electric.

E. Temperature control wiring shall be by others as indicated under the heating, ventilating and air conditioning section.

F. Provide a suitable plywood backboard on a wall and/or angle iron or unistrut framework with plywood for all starters. Starters will be installed and wired under this section.

G. All starters shall be located next to the panel feeding same, if panel is in a closet or utility space, unless noted otherwise on the drawings. If panel is located in a finished space (i.e. corridor, gymnasium, etc.) starters shall be located in nearby utility closet or space acceptable to the Engineer.

H. Nameplates: Each starter shall have a 1.0" x 2.5" hot stamped nameplate identifying the unit and panel it is fed from. The lettering shall be white 1/2" high in a black background.

I. Elevators:
   1. The electrical contractor (E.C.) shall verify the horsepower, voltage, starting method (i.e.; across-the-line, solid-state, etc.), and recommended over-current protection with the elevator supplier, prior to installing any material. Coordinate with Engineer for any discrepancies between plans and actual elevator to be installed prior to ordering related electrical material.
   2. Provide a minimum of one (1) fire alarm system smoke detector in each elevator lobby, at each landing and in each machine room. Provide necessary connections between the smoke detectors and elevator controller for recall requirements. Coordinate with local authority having jurisdiction for primary and alternate recall landings.
   3. Provide a pit light and switch with convenience receptacle in each elevator pit; switch shall be accessible from pit access floor, located 18” above floor. The pit convenience receptacle shall have GROUND FAULT PROTECTION (GFCI). Provide GFCI type duplex convenience receptacles in each elevator machine room. Lighting in hoistways shall not be connected to the load side of the GFCI receptacle. Locate light fixture to avoid being struck by the elevator car or counter-weight; coordinate with elevator supplier. The switch shall be located so as to be readily accessible from the pit door.
   4. Provide a fused mainline heavy-duty disconnect switch in machine room with feeder wires to elevator controller, all piped in accordance with NEC, and grounded. Provide a #6 AWG, minimum, green colored ground for the disconnect switch and controller. Disconnect switch shall be located on the jamb side of the machine room door and shall be the type that cannot be engaged with the door open.
   5. Machine rooms shall have a minimum of seven (7) feet clear headroom under all obstructions, including light fixtures.
   6. Provide power and disconnects for all car lights, fans, car signals, viscosity control heaters, elevator controls and other provided equipment. Coordinate with elevator supplier for exact requirements.
   7. Only electrical equipment, wiring, devices, etc..., required for the operation of the elevator shall be permitted in the elevator machine room, pit and hoistway. All electrical equipment, devices, wiring, raceways, junction boxes, etc., foreign to the elevator shall not be installed in the elevator machine room or hoistway.
   8. Provide a dedicated GFCI receptacle and branch circuit (20A/125V) in a weather-proof while-in-use enclosure in each elevator pit for sump pump.
   9. Provide an ADA compliant telephone or intercom for each elevator.

10. In hoistways, all electrical equipment located less than 48-inches above the pit floor shall be weatherproof (NEMA 4); and wiring shall be identified for use in wet locations in accordance with the requirements in NFPA 70.
11. Where sprinklers are installed in elevator machine rooms or hoistways, E.C. shall provide with heat detectors (used to automatically disconnect the main line power supply to the elevator prior to the application of water from sprinklers) a set of normally closed contacts with wiring from the heat detector to a shunt trip circuit breaker in the panel supplying power to the elevator. The normally closed contacts shall be closed when the heat detector is not activated and shall be opened when the heat detector is activated.
12. Where emergency return unit is provided with the elevator, the electrical contractor shall provide a set of auxiliary contacts with the elevator disconnect switch and wiring to the elevator controller, per ANSI/NFPA 70-1996, section 620-91(c). The auxiliary contacts shall be positively open when the disconnect switch is open. The auxiliary contacts shall cause the emergency return unit power source to be disconnected from its load when the disconnecting means is in the open position. Verify requirements with elevator supplier.
13. Provide fire alarm system connections for elevator cab "fire-fighters hat" indicator as required. Coordinate connection requirements with elevator and fire alarm system manufacturers as required.
14. Provide control modules that shall capture the elevator when the fire alarm system is activated and therefore bring the elevator cab to a pre-determined floor & alternate floor as required. Coordinate with elevator manufacturer & installer for connections and programming. Coordinate with fire department & architect for pre-determined floor and alternate floor.

J. Connections to systems: Make electrical connections in accordance with equipment manufacturer's instructions. Make conduit connections to equipment using flexible conduit. Use liquid-tight flexible conduit with watertight connectors in damp or wet locations. Make wiring connections using wire and cable with insulation suitable for temperatures encountered in heat producing equipment. Provide receptacle outlet where connection with attachment plug is indicated. Provide cord and cap where field-supplied attachment plug is indicated. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes. Install disconnect switches, controllers, control stations, and control devices as indicated. Modify equipment control wiring with terminal block jumpers as indicated. Provide interconnecting conduit and wiring between devices and equipment where indicated.

K. Building and Energy Management Systems (BMS/EMS): This contractor shall provide a price to the Mechanical Contractor to provide power and data wiring to all BMS/EMS components requiring same. Coordinate with Mechanical Contractor prior to bid and prior to any work the exact wiring requirements, connections requirements and exact locations for all BMS/EMS components. Such components shall include, but may not be limited to:
    1. Control transformers
    2. Central equipment controllers
    3. BMS controllers
    4. BMS Head-end equipment
    5. Line-voltage thermostats

2.9 SUPPORTING DEVICES

A. Materials and Finishes: Provide adequate corrosion resistance. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products. Steel channel shall be galvanized.

B. Anchors and Fasteners:
    1. Concrete Structural Elements: Use precast insert system, expansion anchors.
    2. Steel Structural Elements: Use beam clamps, or welded fasteners.
    3. Concrete Surfaces: Use self-drilling anchors or expansion anchors.
    4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
    5. Solid Masonry Walls: Use expansion anchors or preset inserts.

6. Sheet Metal: Use sheet metal screws.
7. Wood Elements: Use wood screws.

C. Installation: Install products in accordance with manufacturer's instructions. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation". Do not fasten supports to pipes, ducts, mechanical equipment, and conduit. Do not use spring steel clips and clamps. Do not use powder-actuated anchors. Do no drill or cut structural members. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts. Install surface-mounted cabinets and panelboards with minimum of four anchors. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

2.10 ELECTRICAL IDENTIFICATION

A. Nameplates: Engraved three-layer laminated plastic, black letters on white background. Locations: Each electrical distribution and control equipment enclosure, communication cabinets. Letter Size: Use 1/8 inch letters for identifying individual equipment and loads. Use 1/4 inch letters for identifying grouped equipment and loads.

B. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use for identification of individual power receptacle faceplates indicating panel & circuit number the outlet is fed from and control device stations. In addition to nameplates as described above, use labels on all panelboards, disconnect switches and enclosed circuit breakers to identify where the equipment is fed from, voltage & phase.

C. Wire markers: Tape, or tubing type wire markers. Locations: Each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection. Power and Lighting Circuits shall be marked with panel and branch circuit or feeder number as indicated on drawings. Control Circuits shall be marked with control wire number indicated on schematic and interconnection diagrams on drawings

D. Conduit markers: Corrosion and abrasion resistant. Location: Furnish markers for each conduit longer than 6 feet (2 m). Spacing: 20 foot on center. Indicate voltage and phase.

E. All panelboards shall be provided with a typed (hand written is not allowed) circuit directory indicating the load fed by each circuit breaker and it's location in the building.

2.11 TWO-WINDING TRANSFORMERS

A. Division 1 - Material and Equipment: Product Options and Substitutions.

B. Manufacturers:
1. Square D Company.
2. Cutler Hammer
3. Siemens
4. Substitutions: Under the provisions of Division 1.

C. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers, ratings as indicated in schedule on plans. Transformers shall comply with NEMA TP-1, Energy Star Requirements and Department of Energy Efficiency Standards.

D. Primary Voltage: 480 volts, 3 phase unless otherwise noted on plans.

E. Secondary Voltage: 208Y/120 volts, 3 phase unless otherwise noted on plans.

F. Insulation system and average winding temperature rise for rated kVA as follows:
1. 1-15 kVA: Class 185 with 115 degrees C rise.
2. 16-500 kVA: Class 220 with 115 degrees C rise.

G. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

H. Winding Taps:
1. Transformers Less than 15 kVA: Two 5 percent below rated voltage, full capacity taps on primary winding.

2. Transformers 15 kVA and Larger: NEMA ST 20.

I. Sound Levels: NEMA ST 20.
J. Basic Impulse Level: 10 kV for transformers less than 300 kVA, 30 kV for transformers 300 kVA and larger.
K. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
L. Mounting:
1. 1-15 kVA: Suitable for wall mounting.
2. 16-75 kVA: Suitable for wall, floor, or trapeze mounting.
3. Larger than 75 kVA: Suitable for floor or trapeze mounting.
M. Coil Conductors: Continuous windings with terminations brazed or welded.
N. Enclosure: NEMA ST 20, Type 1. Provide lifting eyes or brackets.
O. Isolate core and coil from enclosure using vibration-absorbing mounts.
P. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.
Q. Set transformer plumb and level.
R. Use flexible metal conduit, 2-feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
S. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.
T. Mount floor-mounted transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure. Provide 4” high concrete housekeeping pad for transformers.
U. Mount trapeze-mounted transformers as indicated.
V. Provide seismic restraints.
W. Provide grounding and bonding per Code.

2.12 ENCLOSED SWITCHES

A. Fusible Switch Assemblies shall be provided in accordance with the following. Description: NEMA KS 1, Type GD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position. Fuse clips: Designed to accommodate NEMA FU1, Class R fuses. Provide NEMA 3R where located outdoors, kitchens or other interior wet areas.
B. Non-fusible switch assemblies shall be provided in accordance with following. Description: NEMA KS 1, Type GD with externally operable handle interlocked to prevent opening front cover with switch in ON position enclosed load interrupter knife switch. Handle lockable in OFF position. Provide NEMA 3R where located outdoors, kitchens or other interior wet areas.
C. Install in accordance with NECA "Standard of Installation”. Install fuses in fusible disconnect switches. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

2.13 PANELBOARDS

A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
B. Panelboard Bussing: Bus bars shall be copper. Provide copper ground bus bar in all panelboards.
C. Minimum Integrated Short Circuit Rating: 10,000 amperes RMS symmetrical for 240 volt panelboards; 65,000 amperes RMS symmetrical for 480 volt panelboards, or as indicated.
D. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.
E. Enclosure: NEMA PB 1, Type 1.
F. Cabinet Box: 6 inches deep, 20 inches wide for 240 volt and less panelboards, 20 inches wide for 480 volt panelboards.

G. Cabinet Front: Flush or Surface cabinet front as scheduled with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard ANSI 49 enamel.

2.14 ENCLOSED CIRCUIT BREAKERS

A. Enclosed Molded Case Circuit Breaker: Comply with NEMA AB 1. Include provisions for padlocking. Provide insulated grounding lug in each enclosure. Provide Products suitable for use as service entrance equipment where so applied. Fabricate enclosure from steel.
B. Install enclosed circuit breakers where indicated, in accordance with manufacturer's instructions. Install enclosed circuit breakers plumb. Provide supports in accordance with these specifications. Height: 5 ft (1.6 M) to operating handle. Provide engraved plastic nameplates.
C. Inspect each circuit breaker visually. Perform several mechanical ON-OFF operations on each circuit breaker. Verify circuit continuity on each pole in closed position. Determine that circuit breaker will trip on overcurrent condition, with tripping time to NEMA AB 1 requirements. Include description of testing and results in test report.

2.15 FUSES

A. All fuses shall be rated for proper voltage in which they are applied. Interrupting ratings shall be greater than the short circuit current available at the terminals of the switch.
B. Fuse types:
   1. Fuses for branch circuits shall be time delay class J.
   2. Fuses for equipment other than motor loads shall be general fast acting RK-5 or Class J.
   3. Control power transformers for motor controller circuits shall be as recommended by motor starter and motor control center manufacturer.
   4. Fuses for motors shall be sized at 250% of the motor FLA.
   5. Fuses for non-motor loads shall be sized at 125% of the rated FLA of equipment served.
   6. Fuses for elevator lifts shall be dual element type and sized in accordance with the elevator manufacturer’s recommendations.
C. Spare Fuses
   1. Provide spare fuses in the amount of 20% (not less than three (3) nor more than nine (9) of all sizes and types).
   2. Spare fuses shall include general purpose fuses, motor fuses, and control fuses used in motor control centers, starters etc.
   3. A complete list and quantity of spare fuses shall be submitted with record drawings for review.

2.16 ENCLOSED MOTOR CONTROLLERS

A. The Electrical Contractor shall review the mechanical drawings and coordinate with the Mechanical Contractor for electrical components of the mechanical equipment and systems such as motors, factory mounted motor starters, factory mounted disconnect switches, variable frequency drives and controls to be provided under Division 15 (by the Mechanical Contractor).
B. The Electrical Contractor shall provide motor starters, variable frequency drives and disconnect switches for equipment shown on the drawings where the Mechanical Contractor is not providing such equipment.
C. The electrical contractor shall provide all power wiring for all HVAC equipment.
D. Manual Motor Controller: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller with thermal overload elements on each phase, red pilot light, NO, NC auxiliary contact, and push button or toggle operator.
E. Fractional Horsepower Manual Controller: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload elements on each phase, red pilot light, and toggle operator.

F. Motor Starting Switch: NEMA ICS 2, AC general-purpose Class A manually operated, full-voltage controller for fractional horsepower induction motors, without thermal overload elements on each phase, with red pilot light and toggle operator.
G. Enclosures: NEMA ICS 6; Type 1 for indoors and Type 3R for outdoors and wet/damp locations (kitchens, mechanical rooms, pool equipment rooms, etc...).
H. Automatic Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower. Reversing Controllers: Include electrical interlock and integral time delay transition between FORWARD and REVERSE rotation. Two Speed Controllers: Include integral time delay transition between FAST and SLOW speeds. Coil operating voltage: 120volts, 60 Hertz. Overload Relay: NEMA ICS; bimetal or melting alloy. Enclosure: NEMA ICS 6, Type 1 for indoors or Type 3R for outdoors and wet/damp locations (kitchens, mechanical rooms, pool equipment rooms, etc...).
I. Product Options and Features as follows. Auxiliary Contacts: NEMA ICS 2, 2 each normally open and closed contacts in addition to seal-in contact. Cover Mounted Pilot Devices: NEMA ICS 2, standard duty type. Pilot Device Contacts: NEMA ICS 2, Form Z, rated A150. Pushbuttons: Recessed type. Indicating Lights: LED type. Selector Switches: Rotary type. Relays: NEMA ICS 2. Control Power Transformers: 120 volt secondary, in each motor starter. Provide fused primary and secondary, and bond un-fused leg of secondary to enclosure.
J. Installation Requirements: Install enclosed controllers where indicated, in accordance with manufacturer's instructions. Install enclosed controllers plumb. Provide supports in accordance with these specifications. Height: 5 feet to operating handle. Install fuses in fusible switches. Select and install overload heater elements in motor controllers to match installed motor characteristics. Provide engraved plastic nameplates under these specifications. Provide neatly typed label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

2.17 SWITCHBOARD

(red=existing green=new pick one)

A. Description: NEMA PB 2 switchboard with electrical ratings and configurations as indicated and specified. The dimensions shown in the detail are based on Siemens. The electrical contractor (E.C.) shall be responsible for verifying physical sizes of all equipment and ensure the equipment will fit in the space shown with all required clearances prior to submitting substituted equipment shop drawings. Bracing and protective devices shall be such as to withstand and interrupt short circuit stresses of 65,000 amps symmetrical or available short circuit whichever is larger. The main switchboard shall be listed with an Underwriters label attesting to its suitability as service entrance equipment. Acceptable manufacturers are Cutler-Hammer, Square D, Siemens.
B. Ratings:
   1. Voltage: 480Y/277 volts as required.
   2. Configuration: Three-phase, four wire, grounded.
   3. Integrated Equipment Rating: As noted on the plans.
C. Main Section Devices: Individually mounted. 1600amp/3-pole main circuit breaker. Provide ground fault protection. Provide surge protection.
D. Distribution Section Devices: Group mounted. If adding new circuit breakers to an existing switchboard, the electrical contractor (E.C.) shall provide new circuit breaker in existing distribution switchboard in existing blank space or space available after demolition work. Prior to bid, the E.C. shall coordinate with the Owner and/or facilities representative for exact location of new tie-in point and provide all material & labor as required for electrical connections to the existing distribution switchboard. The new circuit breaker(s) shall have the same electrical characteristics and be compatible with the existing distribution switchboard.
E. Meter / Auxiliary Section Devices: Individually mounted. Provide utility meter sockets per the serving utility company requirements. Each meter shall have an individual circuit breaker.
F. Bus Material: Copper with tin plating, standard size.
G. Bus Connections: Bolted, accessible from front for maintenance.

H. Ground Bus: Extend length of the switchboard.
I. Molded Case Circuit Breakers: for all distribution equipment shall be thermo-magnetic. Molded case breakers to match existing characteristics. Provide circuit breakers UL listed as Type HACR for air-conditioning equipment branch circuits.
J. Future Provisions: Fully equip spaces for future devices with bussing and bus strap connections for maximum CB listed, suitably insulated and braced for short circuit currents. Provide continuous current rating as indicated.
K. Pull Box: If required, shall have removable top and sides, same construction as switchboard, size as shown on Drawings. Provide insulating, fire-resistive bottom with separate openings for each circuit to pass into switchboard.
L. E.C. shall coordinate with general and mechanical contractors prior to installation of the switchboard or any mechanical systems to verify and ensure all systems, piping, ductwork, etc... foreign to switchboard will comply with NEC article 110 for "working space" and "dedicated electrical space".
M. Provide a micro-processor based monitoring device that provides simultaneous current, voltage, and frequency metering. 1% accuracy for AC amperes and AC voltage and 0.5% accuracy for frequency.
N. Current Transformers: ANSI C57.13, 5-ampere secondary, wound or window type, with single secondary winding and secondary shorting device, primary/secondary ratio as required, burden and accuracy consistent with connected metering and relay devices, 60 hertz.
O. Potential Transformers: ANSI C57.13, 120 volt single secondary, disconnecting type with integral fuse mountings, primary/secondary ratio as required, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.
P. Tighten accessible bus connections and mechanical fasteners after placing switchboard. Adjust all operating mechanisms for free mechanical movement. Tighten bolted bus connections in accordance with manufacturer's instructions. Adjust circuit breaker trip and time delay settings to values as required by manufacturer.

2.18 ENCLOSED CONTACTORS

A. General purpose contactors: NEMA ICS 2, AC general purpose magnetic contactor. Coil Voltage as indicated. Poles as indicated. Size as indicated. Enclosure per ANSI/NEMA ICS 6, Type as scheduled.
B. Lighting contactors: NEMA ICS 2, magnetic lighting contactor. Coil Voltage as indicated. Poles as indicated. Size as indicated. Contact Rating shall match branch circuit overcurrent protection, considering de-rating for continuous loads.
C. Accessories: Provide Pushbuttons and Selector Switches per NEMA ICS 2, heavy duty type. Provide indicating lights per NEMA ICS 2, push-to-test type. Provide auxiliary contacts per NEMA ICS 2, Class A300 or A600 as required per equipment served.

2.19 FIRE ALARM SYSTEM

A. GENERAL
1. The contractor shall submit complete documentation for the Fire Alarm/Life Safety System Data Sheets for all items to ensure compliance with these specifications. Copies of this information shall be submitted as required to the Architect award of this work and shall be subject to the approval of the architect.
2. The contractor shall submit, as part of the complete bid documentation package, certification that the engineered system distributor is a fully authorized factory trained and certified distributor of the system detailed within this specification.
3. All equipment and material shall be new and unused, and listed by Underwriter's Laboratories for the specific intended purpose. All control panel components, field peripherals and interactive computer peripherals shall be designed for continuous duty operation without degradation of function or performance.
4. All equipment covered by this specification or noted on installation drawings shall be the best equipment suited for the application and shall be provided by a single manufacturer.
5. Provide all equipment and accessories and compatible devices for a complete and fully functioning addressable fire alarm system. The fire alarm system shall be coordinated with and inspected by

the local fire department, and any inconsistency mentioned during any inspection shall be corrected by contractor at no additional cost to owner.

6. The control panel shall contain a microprocessor with 10/100 ethernet media access controller (MAC). The system shall be designed specifically for fire detection, and notification applications.
7. The installing contractor shall coordinate master-box, radio-box, and/or dialer requirements with local fire department.

B. FIRE ALARM LIFE SAFETY SYSTEM SEQUENCE OF OPERATION

1. Public Mode: The operation of a manual station or activation of any automatic alarm initiating device (system smoke, heat, waterflow) in the common areas of the building, shall automatically:
   a. Initiate the transmission of the alarm to the Municipal Fire Station or approved Central Station via the Local Energy or Radio Master-box where required by Code.
   b. Sound a code 3 temporal evacuation signal over all audible circuits.
   c. Flash all visual signals throughout the building in a synchronized manner.
   d. Flash an alarm LED and sound an audible signal at the FACP. Upon acknowledgement, the alarm LED shall light steadily and the audible shall silence. Subsequent alarms shall re-initiate this sequence.
   e. Upon alarm initiation by an elevator lobby smoke detector or other designated recall device, recall all elevators that serve the floor of initialization to the main egress level. If the alarm initiates on the main egress level, return the elevator to the alternate floor as directed by the local authority having jurisdiction.
   f. Visually indicate the alarm initiating device type and location via the LCD display located at the FACP (and at any remote annunciators) and (illuminate the appropriate alarm zone LED at the remote annunciator).
   g. Automatically shut down or control HVAC equipment to initiate smoke control functions as required. Manual override controls and programmable relay interface shall serve as an interface to the Building Automation System.
   h. Operate prioritized outputs to release all magnetically held smoke doors and magnetically locked doors throughout the building.
   i. Activate the exterior weatherproof beacon.
2. Private mode: The activation of any automatic local alarm initiating device (sounder-base with smoke, or combination smoke/carbon monoxide device) within an apartment shall automatically:
   a. Sound a code 3 temporal evacuation signal for smoke to all alarm devices within the apartment and a code 4 temporal evacuation signal for carbon monoxide to all alarm devices within the apartment.
   b. Visually indicate a supervisory trouble condition of the type and location of the initiating device via the LCD display located at the FACP (and at any remote annunciators) and (illuminate the appropriate zone LED at the remote annunciator).

C. WIRING

1. Provide in accordance with manufacturer's instructions all wiring, conduit and outlet boxes required for the installation of complete system as described herein and as shown on the drawings. Wiring shall be Class A.
2. Installation and fire alarm system wiring shall be installed in metal raceway. An equipment bonding conductor shall be provided in all flexible metallic raceways.
3. Color code for fire alarm systems shall be per the State Fire Alarm code.
4. DC supply to the main fire alarm panel shall be white and black. Fire alarm primary power source shall be on dedicated branch circuit. Circuit breaker locks shall be used. If a separate feed is required for the battery charger it shall be black and white unless the main fire alarm panel required only AC feed. In this case the conductors to the battery charger shall be red and white and shall be on a circuit breaker of fits own.
5. Conductors shall be minimum #14-gauge solid copper type THHN/THWN. Conductor's size shall be increased as required to maintain voltage drop to a maximum of 3%. All AC and DC portions of the system shall be installed in separate raceway. Addressable loop wiring may be #16 providing manufacturer's recommended distance is observed. Systems requiring shielded wiring for addressable loops shall not be acceptable.

6. Red painted terminal cabinets with hinged local covers shall be provided at all junction points. All conductor splices shall be made on screw type terminal blocks, wire nuts shall not be used. All terminals within terminal cabinet shall be properly labeled. Provide terminal cabinet at each building cable entrance and at other locations as required.
7. All fire alarm initiating zone and signal wiring shall be wired Class A.
8. Final connections between the equipment and the wiring system shall be made under the direct supervision of a representative of the manufacturer.
9. Upon completion of the installation of fire alarm equipment, the electrical contractor shall provide to the engineer a signed statement substantially in the form as follows:
    a. The undersigned having been engaged as the electrical contractor on this project confirms the fire alarm equipment was installed in accordance with the specifications and in accordance with wiring diagrams, instructions, and directions provided to us by the manufacturer.

D. GUARANTEE AND FINAL TEST
1. All testing (pre-testing, final testing, quarterly testing and program change testing) to be coordinated with the owner and scheduled in advance so that owners and personnel can be present during testing. Contractor to certify that all tests comply with the “State Fire Code”, latest edition.
2. Before this installation shall be considered complete and acceptable to the awarding authorities, a complete test on the system shall be performed as follows:
    a. A pre-test will be held by the electrical contractor with the manufacturer’s authorized representative present. After certification of a complete pre-test, the installing contractor shall inform the authority having jurisdiction of the outcome of the test and will re-inspect in the presence of the authority having jurisdiction and the manufacturer’s authorized representative.
    b. Final test: The electrical contractor in the presence of authorized representative of the manufacturer and the fire department shall operate every manual station, smoke detector, and thermodetector. Each station/detector circuit and horn circuit shall be opened in at least two locations to check for the presence of correct supervisory circuitry. When this testing ahs been completed to the satisfaction of both the electrical contractor’s job foreman and the representative of the manufacturer, a letter from the contractor cosigned by the manufacturer attesting t the satisfactory completion of said testing, shall be forwarded to the owner.
3. The electrical contractor shall guarantee all equipment and wiring to be free from inherent mechanical and electrical defects for a period of one year from the date of final acceptance.
4. The contractor shall provide the Owner with a formal written equipment guarantee upon completion of the installation and testing of the system. The guarantee period shall begin on the day of acceptance of the system by the Owner and shall provide for a period of one year. This guarantee shall be indicated in the manufacturer’s submission prior to approval. This guarantee shall be as normal policy by the equipment manufacturer.
5. The manufacturer shall maintain a full-time service and parts facility, with seven days per week, 24 hour per day service available.
6. All service technicians shall be licensed by the State Fire Code covering service and maintenance of systems.
7. Include as part of the contract, the four quarterly tests following the final acceptance test. Provide quarterly testing in conformance with the State Fire Code latest addition.

PART 3 – EXECUTION

3.1 BASIC REQUIREMENTS

A. Adhere to best industry practice and the following:
1. All work shall be concealed.
2. Route circuitry runs embedded in concrete to coordinate with structural requirements.
3. Equip each raceway intended for the future installation of wire or cable with a nylon pulling cord 3/16” in diameter and clearly identify both ends of the raceway.
4. Provide all outlet boxes, junction boxes, and pull boxes for proper wire pulling and device installation. Include those omitted from the drawings due to symbolic methods of notation.

5. Utilize lugs of the limited type to make connections at both ends of cables installed on the line side of main service overcurrent and switching devices. Provide cable limiters for each end of each service entrance cable.
6. Beyond the termination of raceways, fireproof the following:
   a. All wires and cables within pad-mounted transformer enclosure.
   b. All service feeder cables ahead of main service overcurrent protection devices, and elsewhere where not in raceways.
7. Fireproofing of wires and cables shall be by means of a half-lapped layer of arcproof or by means of sleeving of a type specifically manufactured for the purpose. Ends of tape or sleeving shall be severed with twine. Fireproofing shall be extended up into raceways. After conductors have been finally shaped into their permanent configuration, fireproofing tape or sleeving shall be coated with silicate of soda (water glass). Fireproofing shall be applied in an overall manner to raceway groupings of conductors.
8. Provide all sleeves through fireproof and waterproof slabs, walls, etc., required for electric work.
9. Provide waterproof sealing for the sleeves through waterproof slabs, walls, etc.
10. Provide fireproof sealing for the sleeves through fireproof walls, slabs, etc.
11. Provide fireproof sealing for the openings in fireproof walls, slabs, etc., resulting from removal of existing electrical sleeves, conduits, poke-thru's etc.
12. No splicing of wires will be permitted in the Fire Alarm System.
13. Bundle wiring passing through pull boxes and panelboards in a neat and orderly manner with plastic cable ties. Cable ties shall be by Ty-Raps as manufactured by Thomas & Betts, Holub Industries Inc., Quick Wrap, Bundy Unirap, or equal.
14. Turn branch circuits and auxiliary system wiring out of wiring gutters at 90 degrees to circuit breakers and terminal lugs.

3.2 TESTING REQUIREMENTS & INSTRUCTIONS

A. Where any repairs, modifications, adjustments, tests or checks are to be made, the Contractor shall contact the Engineer to determine if the work should be performed by or with the Manufacturer's Representative.
B. Tests are to:
   1. Provide initial equipment/system acceptance.
   2. Provide recorded data for future routine maintenance and trouble-shooting.
   3. Provide assurance that each system component is installed satisfactorily and can be expected to perform, and continue to perform its specified function with reasonable reliability throughout the life of the facility.
C. At any stage of construction and when observed, any electrical equipment or system determined to be damaged, or faulty, is to be reported to the Engineer. Corrective action by the Contractor requires prior Engineer approval, retesting, and inspection.
D. When the electrical tests and inspections specified or required within Division 16 are completed and results reported, reviewed, and approved by the Engineer, the Contractor may consider that portion of the electrical equipment system or installation electrically complete. The Contractor will then affix appropriate, approved, and dated completion or calibration labels to the tested equipment and notify the Engineer of electrical completion. If the Engineer finds completed work unacceptable, he will notify the Contractor in writing of the unfinished or deficient work, with the reason for his rejection, to be corrected by the Contractor. The Contractor will notify the Engineer in writing when exceptions have been corrected. The Contractor will prepare a "Notification or Substantial Electrical Completion" for approval by the Engineer following Engineer's acceptance of electrical completion. If later in-service operation or further testing identified problems attributable to the Contractor, these will be corrected by the Contractor, at no additional cost to the Authority.
E. Grounding Systems:
   1. Test main building loops and major equipment grounds to remote earth, directly referenced to an extremely low resistance (approximately 1 ohm) reference ground benchmark. Perform a visual inspection of the systems, raceway and equipment grounds to determine the adequacy and

integrity of the grounding. Ground testing results shall be recorded, witnesses, and submitted to the Engineer.

2. Perform ground tests using a low resistance, null-balance type ground testing ohmmeter, with test lead resistance compensated for. Use the type of test instrument which compensates for potential and current rod resistances.
3. Test each ground rod and measure ground resistance. If resistance is not 10 ohms or less, drive additional rods to obtain a resistance of 10 ohms or less. Submit tabulation of results to Engineer. Include identification of electrode, date of reading and ground resistance valve in the test reports.
4. Test each building and major equipment grounding system for continuity of connections and for resistance. Ground resistance of conduits, equipment cases, and supporting frames, shall not exceed 5 ohms to ground. Submit all readings to the Engineer.
5. Where ground test results identify the need for additional grounding conductors or rods that are not indicated or specified, design changes will be initiated to obtain the acceptable values. The Contractor is responsible for the proper installation of the grounding indicated and specified.
6. Operating Instructions: Furnish operating instructions to Owner's designated representative with respect to operations, functions and maintenance procedures for equipment and systems installed. Cost of such instruction up to a full five (5) days of Electrical Subcontractor's time shall be included in contract. Cost of providing a Manufacturer's Representative at site for instructional purposes shall also be included.

3.3 BRANCH CIRCUITRY

A. For all lighting and appliance branch circuitry, raceway sizes shall conform to industry standard maximum permissible occupancy requirements except where these are exceeded by other requirements specified elsewhere.
B. Circuits shall be balanced on phases at their supply as evenly as possible.
C. Feeder connections shall be in the phase rotation which establishes proper operation for all equipment supplied.
D. Reduced size conductors indicated for any feeders shall be taken as their grounding conductors.
E. Feeders consisting of multiple cables and raceways shall be arranged such that each raceway of the feeder contains one (1) cable for each leg and one (1) neutral cable, if any.
F. For circuitry indicated as being protected at 20 Amps or less, abide by the following:
   1. All 20 amp, 120/208 volt, 3-phase, 4-wire combined branch circuit homeruns shall be provided with a #8 AWG neutral conductor.
   2. Minimum conductor size shall be No. 12 AWG cooper.
   3. Conductors operating at 120 volts extending in excess of 100 ft. or at 277 volts extending in excess of 200 ft., or the last outlet or fixture tap shall be No. 10 AWG cooper throughout.
   4. Lighting fixtures and receptacles shall not be connected to the same circuit.
G. Type MC Cable Installation:
   1. Where cable is permitted under the products section, the installation of same shall be done in accordance with code and the following:
      a. Cable shall be supported in accordance with code. Tie wire is not an acceptable means of support. Cable supports such as Caddy WMX-6, MX-3, and clamps such as Caddy 449 shall be used. Where cables are supported by the structure and only need securing in place, then ty-raps will be acceptable. Ty-raps are not acceptable as a means of support. All fittings, hangers, and clamps for support and termination of cables shall be of type specifically designed for use with cable, i.e., romex connectors not acceptable.
      b. Armor of cable shall be removed with rotary cutter device equal to roto-split by Seatek Co.; not with a hacksaw.
      c. Use split "Insuliner" sleeves at terminations.

3.4 REQUIREMENTS GOVERNING ELECTRICAL WORK IN DAMP OR WET LOCATIONS

A. Outlets and outlet size boxes shall be of galvanized cast ferrous metal only.

B. The finish of threaded steel conduit shall be galvanized only.
C. Wires for pulling into raceways for lighting and appliance branch circuitry shall be limited to “THWN”.
D. Wires for pulling into raceways for feeders shall be limited to “THWN”.
E. Plates for toggle switches and receptacles shall have gasketed snap shut covers suitable for wet locations while in use.
F. Final connections of flexible conduit shall be neoprene sheathed.
G. Apply one (1) layer of half looped plastic electric insulating tape over wire nuts used for joining the conductors of wires.
H. Enclosures, junction boxes, pull boxes, cabinets, cabinet trims, wiring troughs and the like, shall be fabricated of galvanized sheet metal, shall conform to the following:
   1. They shall be constructed with continuously welded joints and seams.
   2. Their edges and weld spots shall be factory treated with cold galvanizing compound.
   3. Their connection to circuitry shall be by means of watertight hub connectors with sealing rings.
I. Enclosures for individually mounted switching and overcurrent devices shall be NEMA Class IV weatherproof construction.
J. The covers, doors and plates and trims used in conjunction with all enclosures, pull boxes, outlet boxes, junction boxes, cabinets and the like shall be equipped with gaskets.
K. Panels shall be equipped with doors without exception.
L. The following shall be interpreted as damp or wet locations within building confines:
   1. Spaces where any designations indicating weatherproof (WP) or vapor proof appear on the drawings.
   2. Below waterproofing in slabs applied directly on grade.
   3. Spaces defined as wet or damp locations by Article 100 of the National Electric Code.
   4. Parking garage.

3.5 REQUIREMENTS GOVERNING ELECTRIC WORK IN AIR HANDLING SPACES

A. Within air handling ductwork or plenums (other than spaces within suspended ceilings used for air handling purposes), Area “B” and the media shall comply with requirements for return air plenums.
B. Abide by the requirements specified for electric work in damp locations within building confines.
C. Where circuitry passes through duct walls, include, in accordance with instructions issued in the field, airtight sealing provisions which allow for a relative movement between the circuitry and the duct walls.
D. Exclude the installation of type NM or NMC cable.
E. In spaces within suspended ceilings used for air handling purposes, abide by the requirements specified for normal electric work conditions except:
F. Lighting fixtures recessed into the ceilings shall be certified as being suitable for this purpose.

3.6 UNDERGROUND CONDUIT DUCT BANKS

A. The electrical work required in conjunction with underground conduit banks shall include providing all conduits.
B. Conduits for underground banks shall be:
   1. Trade diameter size as indicated but in no case less than one inch.
   2. Polyvinyl chloride Schedule 40 (approved for encased burial) duct, rigid steel conduit for vertical elbows and straight sections used to penetrate equipment pads, building foundation walls and concrete slabs.
C. All conduits indicated as being incorporated into conduit banks unless specifically noted as rigid steel conduits shall be encased in a concrete envelope which accommodates the indicated configuration of conduits and which encompasses dimensions as follows:
   1. Outside surfaces of conduits to outside surface of envelope where reinforcement of encasement is required – 6” minimum.
   2. Outside surfaces of conduits to outside surface of envelope where no reinforcement of encasement is required – 3” minimum.
   3. Spacing between centerlines of conduits assigned to different categories of use primary feeders, secondary feeders, communications and signaling – 10-1/2” minimum.

4. Spacing between centerlines of conduits assigned to the same category of use – 7-1/2" minimum.

D. Reinforcement of the concrete encasement for conduit banks where required shall consist of No. 4 longitudinal reinforcing bars located 3" from the outside surface of the envelope and spaced 6" on centers all around. No. 8 wire reinforcing hoops set 8" apart shall be used to tie the longitudinal bars together.
E. Install conduit in such a manner as to provide a minimum cover of 30 inches after final grading except the cover may be reduced to a minimum of 18 inches to:
   1. Tie into existing work.
   2. Pass over other underground utilities.
   3. Pass over underground obstructions.
   4. Assist in the avoidance of low points.
F. Increase the minimum cover where required by field conditions.
G. Lay conduit to avoid low points during run. Pitch at a minimum of 3 inches per 100 feet away from building.
H. Provide reinforcement for the concrete encasement of a conduit bank where:
   1. It passes under or over underground utilities.
   2. It passes under or over underground obstructions.
   3. Its cover is reduced to less than 30 inches.
   4. It runs through foundation walls and other building construction.
I. Concrete encasement reinforcing shall extend in each case 5 feet beyond the points at which the determining conditions terminate.
J. Bends in conduit shall have minimum radii as follows:
   1. For primary feeder 15'-0" except where specifically indicated otherwise or where turning up at termination point.
   2. For primary feeder turning up at termination point – 4'-0".
K. Install conduit so that adjacent joints are staggered at least 6 inches from one another.
L. Offsets to accommodate field conditions shall be accomplished with two (2) bends of not more than ten (10) degrees each.
M. Plug both ends of all conduit stubs.
N. Seal the end of each conduit run terminating inside a building utilizing a water and gas-tight sealant manufactured specifically for the purpose.
O. After conduit has been installed with concrete encasement completed, clear each conduit of all obstructions and foreign matter by pulling a flexible mandrel (12" minimum length and a diameter 1/4" less than that of the conduit) and brush through it. In the event that obstructions are encountered in any conduit which will not permit the mandrel to pass, remove and replace the blocked section. Include in the electric work all excavation, backfilling, repair of concrete encasement and restoration of surface at grade involved in the conduit replacement.
P. Provide a nylon cord for the pulling of cable in each conduit in which no cable is to be installed as part of the electric work.
Q. The Electrical Sub-Contractor shall provide all insulated racks as required for proper support of all cables and wires.
R. Provide a continuous nylon warning tape above each full length of duct bank 12 inches below grade.

3.7 LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATION

A. Perform the following work, in accordance with field instructions issued by the Architect to assure that minimal noise is produced by electrical installations due to equipment furnished as part of the electrical work.
B. Check and tighten the fastenings of sheet metal plates, covers, doors and trims used in the enclosures of electrical equipment.
C. Remove and replace any individual device containing one or more magnetic flux path metallic cores (e.g., discharge lamp ballast, transformer, reactor, dimmer, and solenoid) which is found to have a noise output exceeding that of other identical devices installed at the project.

3.8 SUPPORTS AND FASTENINGS

A. Support work in accordance with best industry standards, and Local Electric Code.
B. Include supporting frames or racks for equipment, intended for vertical surface mounting, which is required in a free standing position.
C. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members. They shall be rigidly bolted or welded together and adequately braces to form a substantial structure. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them.
D. No work intended for exposed installation shall be mounted directly on any building surface. In such locations, flat bar members or spaces shall be used to create a minimum of ¼" air space between the building surfaces and the work. Provide ¾" thick exterior grade plywood painted with two (2) coats of fire-retardant gray paint for mounting of panelboards.
E. Nothing (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways or cables for support.
F. Nothing shall rest on, or depend for support on, suspended ceiling media.
G. Support less than 2" trade size, vertically run, conduits at intervals no greater than 8'. Support such conduits, 2-1/2" trade size or larger, at intervals no greater than they story height, or 15', whichever is smaller.
H. Where they are not embedded in concrete, support less than 1" trade size, horizontally run, conduits at intervals no greater than 7'. Support such conduits, 1" trade size or larger, at intervals no greater than 10'.
I. Support all lighting fixtures directly from structural slab, deck or framing member.
J. Where fixtures and ceilings are such as to require fixture support from ceiling openings frames, include in the electric work the members necessary to tie back the ceiling opening frames to ceiling suspension members or slabs so as to provide actual support for the fixtures noted above.
K. As a minimum procedure, in suspended ceilings support smalls runs of circuitry (e.g., conduit not in excess of 1" trade size) from ceiling suspension members as defined above. Support larger runs of circuitry directly from structural slabs, decks or framing members.
L. Fasten electric work to building structure in accordance with the best industry practice.
M. Floor mounted equipment shall not be held in place solely by its own dead weight. Include floor anchor fastenings in all cases.
N. For items which are shown as being ceiling mounted at locations where fastenings to the building construction element above is not possible, provide suitably auxiliary channel or angle iron bridging tying to building structural elements.
O. As a minimum procedure, where weight applied to the attachment points is 100 lbs. or less, fasten to concrete and solid masonry with bolts and expansion shields.
P. As a minimum procedure, where weight applied to building attachment points exceed 100 lbs., but is 300 lbs. or less, conform to the following:
    1. At field poured concrete slabs, utilize inserts with 20' minimum length slip-through steel rods, set transverse to reinforcing steel.

3.9 SPLICING AND TERMINATING WIRES AND CABLES

A. Maintain all splices and joints in removable cover boxes or cabinets where they may be easily inspected.
B. Locate each completed conductor splice or joint in the outlet box, junction box, or pull box containing it, so that it is accessible from the removal cover side of the box.
C. Join solid conductors No. 8 AWG and smaller by securely twisting them together and soldering, or by using insulated coiled steel spring "wire nut" type connectors. Exclude "wire nuts" employing non-expandable springs. Terminate conductors No. 8 AWG and smaller by means of a neat and fast holding application of the conductors directly to the binding screws or terminals of the equipment or devices to be connected.
D. Join, tap and terminate standard conductors No. 6 AWG and larger by means of solder sleeves, taps, and lugs with applied solder or by means of bolted saddle type or pressure indent type connectors, taps and lugs. Exclude connectors and lugs of the types which apply set screws directly to

conductors. Where equipment or devices are equipped with set screw type terminals which are impossible to change, replace the factory supplied set screws with a type having a ball bearing tip. Apply pressure indent type connectors, taps and lugs utilizing tools manufactured specifically for the purpose and having features preventing their release until the full pressure has been exerted on the lug or connector.

E. Except where wire nuts are used, build up insulation over conductor joints to a value, equal both in thickness and dielectric strength, to that of the factory applied conductor insulation. Insulation of conductor taps and joints shall be by means of half-lapped layers of rubber tape, with an outer layer of friction tape; by means of half-lapped layers of approved plastic electric insulating tape; or by a means of split insulating casings manufactured specifically to insulate the particular connector and conductor, and fastened with stainless steel or non-metallic snaps or clips.

3.10 PULLING WIRES INTO CONDUITS AND RACEWAYS

A. Delay pulling wires or cables in until the project has progressed to a point when general construction procedures are not liable to injure wires and cables, and when moisture is excluded from raceways.
B. Utilize nylon snakes or metallic fish tapes with ball type heads to set up for pulling. In raceways 2” trade size and larger, utilize a pulling assembly ahead of wires consisting of a suitable brush followed by a 3-1/2” diameter ball mandrel.
C. Leave sufficient slack on all runs of wire and cable to permit the secure connection of devices and equipment.
D. Include circular wedge-type cable supports for wires and cables at the top of any vertical raceway longer than 20 feet. Also include additional supports spaced at intervals which are no greater than 10’. Supports shall be located in accessible pull boxes. Supports shall be of a non-deteriorating insulating material manufactured specifically for the purpose.
E. Pulling lubricants shall be used. They shall be products manufactured specifically for the purpose.

3.11 REQUIREMENTS FOR THE INSTALLATION OF JUNCTION BOXES, OUTLET BOXES AND PULL BOXES

A. Flush wall-mounted outlet boxes shall not be set back to back but shall be offset at least 12” horizontally regardless of any indication on the drawings.
B. Locate all boxes so that their removable covers are accessible without necessitating the removal of parts of permanent building structure, including piping, ductwork, and other permanent mechanical elements.
C. In conjunction with concealed circuitry, abide by one of the following instructions (as may be applicable to the conditions) in order to assure the aforementioned accessibility. (Not required for circuitry concealed by removable suspended ceiling tiles.)
D. For a small (outlet size) box on circuitry concealed in a partition or wall, locate box or fitting so that its removable cover side, (or the face of any applied raised cover) penetrates through to within 1/8” of the exposed surface of the building materials concealing the circuitry and apply a blank or device plate to suit the functional requirements.
E. For a large box on circuitry concealed in a partition, suspended ceiling, or wall, locate box totally hidden but with its removable cover directly behind an architectural access door or panel (included for the purpose, separate from the electric work) in the building construction which conceals the circuitry.
F. Include all required junction and pull boxes regardless of indications on the drawings (which, due to symbolic methods of notation, may omit to show some of them).
G. Unless noted below or otherwise specifically indicated, include a separate outlet box for each individual wiring device, lighting fixture and signal or communication system outlet component. Outlet boxes supplied attached to lighting fixtures shall not be used as replacements for the boxes specified herein.
H. Utilize an outlet box no smaller than 5” square by 2-1/2” deep.
I. Allow no fixture to be supplied from an outlet box in another room.
J. Multiple local switches indicated at a single location shall be gang-mounted in a single outlet box.
K. Install junction boxes, pull boxes and outlet boxes in conjunction with concealed circuitry.

L. Close up all unused circuitry openings in outlet boxes. Unused openings in cast boxes shall be closed with approved cast metal threaded plugs. Unused openings in sheet metal boxes shall be closed with sheet metal knock-out plugs.
M. Outlet boxes for switches shall be located at the strike side of doors. Indicate door swings are subject to field change. Outlet boxes shall be located on the basis of final door swing arrangements.
N. Boxes and plaster covers for duplex receptacles shall be arranged for vertical mounting of the receptacle.
O. Equip outlet boxes used for devices which are connected to wires of systems supplied by more than one set of voltage characteristics with barriers to separate the different systems.
P. Barriers in junction and pull boxes of outlet size shall be of the same metal as the box.
Q. Barriers in junction and pull boxes which are larger than outlet size shall be of the polyester resin fiberglass of adequate thickness for mechanical strength, but in no case less than 1/4" thick. Each barrier shall be mounted, without fastenings, between angle iron guides so that they may be readily removed.

3.12 LOCATING AND ROUTING OF CIRCUITRY

A. In general, all circuitry shall be run concealed except that it shall be run exposed where the following conditions occur:
   1. Horizontally at the ceiling of permanently unfinished spaces which are not assigned to mechanical or electrical equipment.
   2. Horizontally and vertically in mechanical equipment spaces.
   3. Horizontally and vertically in electric equipment rooms.
B. Concealed circuitry shall be so located that building construction materials can be applied over its thickest elements without being subject to spalling or cracking.
C. All circuitry and raceways shall not be run within slabs. If field conditions requires raceways to be embedded in field-poured structural building construction concrete fill or slab shall conform to the following:
   1. Where turned up or down into a wall or partition they shall, before entering same, be routed parallel for a long enough distance to assure that no relocation of the wall or partition will be necessary to conceal the required bend.
   2. They shall be routed in such a manner as to coordinate with the structural requirements of the building.
   3. They shall be routed in accordance with field instructions issued by the Architect where such instructions differ from specifications set forth herein.
D. Circuitry run exposed shall be routed parallel to building walls and column lines.
E. Circuitry shall be routed so as to prevent electric conductors from being subject to high ambient temperature. Minimum clearances from heated lines or surfaces shall be maintained as follows:
   1. Crossing where uninsulated: 3”.
   2. Crossing where insulated: 1”
   3. Running parallel where uninsulated: 36”.
   4. Running parallel where insulated: 6”.
F. Circuitry shall not be run in elevator shafts, hoistways, and the like. Where outlets for trail cables, pit lights, run be level lights, and the like, are involved, only the “final connection” outlet boxes themselves shall be located within or open into, the confines of the shaft.

3.13 INSTALLING CIRCUITRY

A. The outside surface of circuitry, which is to be embedded in cinder concrete, shall be coated with asphaltum paint.
B. In runs of conduit or raceway including flexible limit the number of bends between cable access points to a total which does not exceed the maximum specified for the particular system. Where no such maximum is specified, limit the number to four (4) right angle bends or the equivalent thereof.
C. In each conduit or raceway assigned for the future pulling in of wires, include a nylon drag cord. In raceways 2” trade size and larger, the cord shall be pulled in utilizing a suitable brush, followed by an

85% diameter ball mandrel ahead of the cord in the pulling assembly. In the event that obstructions are encountered, which will not permit the drag cord to be installed, the blocked section of raceway shall be replaced and any cutting and patching of the structure involved in such replacement shall be included as part of the electric work.

D. Circuitry shall be arranged such that conductors of one feeder or circuitry carrying “going” current are not separated from conductors of the same feeder or circuitry carrying “return” current by any ferrous or other metal. Where not within raceways, all “going” and “return” current conductors of one feeder or circuit shall be laced together so as to minimize induction heating of adjacent metal components.
E. Sleeves used where circuitry is to penetrate waterproof slabs, decks and walls, shall be of a type selected to suit the water condition encountered in the field.

END OF SECTION

Lead Remediation Plan

Elevator Replacement
Providence City Hall
25 Dorrance Street
Providence, Rhode Island

Prepared for:

Providence City Hall
25 Dorrance Street
Providence, RI 02903

Prepared by:

SAGE Environmental, Inc.
301 Friendship Street
Providence, Rhode Island 02903

and

Environmental Lead Detection, Inc.
436 Gardners Neck Road
Swansea, Massachusetts 02777

SAGE Project #L5247018

January 2025

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ATTACHMENTS

1.0 GENERAL CONSIDERATION

This document has been prepared by SAGE Environmental, Inc. (SAGE) and Environmental Lead Detection, Inc. (ELD), to address lead containing materials that may be disturbed during the Elevator Replacement Project at the Providence City Hall in Providence, Rhode Island (hereinafter, "Site").

Commercial buildings are not regulated by Rhode Island Department of Health (RIDOH) or the Environmental Protection Agency (EPA) Repair, Renovation & Painting (RRP) Rule. The Occupational Safety and Health Administration (OSHA) Lead in Construction Standard (29 CFR 1926.62) would apply to this project. The owner shall make all reasonable efforts to ensure that occupants are not present within the areas of the work during Lead in Construction activities. Considering this is a public facility this is likely not possible. At a minimum, critical barriers shall be established to segregate the work zone from areas accessible to the public. The intent of this plan is not to perform de-leading operations or abatement. The intent of the plan is to provide means and methods for disturbance of lead containing materials as needed to achieve the project goals of the elevator replacement. Any demolition required for the project should be assumed to disturb painted surfaces. **Refer to contractor drawings and specifications for specific demolition needs and areas of disturbance.**

Refer to Owner's Contract Documents including bid forms, drawings and specifications – the strictest interpretation of all documents and regulations shall apply where conflicts in the documents arise. The Contractor will comply with the Owner's Contract Documents including drawings.

2.0 BUILDING MATERIALS WITH LEAD COATINGS

SAGE conducted a limited hazardous building materials survey in the areas where work will occur. Sampling was conducted for asbestos containing materials, polychlorinated biphenyls (PCBs) and lead based paint (LBP). A copy of the report is included herein as **Attachment 1.** The EPA defines LBP as paint containing lead levels greater than 1.0 milligram per square centimeter (mg/cm2), or more than 0.5% weight by weight. Results of the paint samples are summarized in **Table 1** below.

Table 1
Lead Results Summary
September 11, 2024
25 Dorrance Street
Providence, RI

Sample ID	Sample Description	Sample Location	Lead Results % Weight	Lead Results Weight (g)
Pb-1	Gold Paint on Metal	1st Floor Elevator Entry	**0.52 % wt**	0.2458 g
Pb-2	Beige Paint	1st Floor Elevator Entry	**0.52 % wt**	0.256 g
Pb-3	Black Paint Threshold	1st Floor Elevator Entry	0.022 % wt	0.2563 g
Pb-4	Yellow Paint	1st Floor Elevator Interior Shaft	**13 % wt**	0.2553 g
Pb-5	Yellow Paint	Basement Elevator Interior Shaft	**3.2 % wt**	0.2693 g
Pb-6	White Paint	Elevator Carriage Ceiling	0.018 % wt	0.2644 g
Pb-7	Grey Paint	Elevator Shaft Penthouse	**18 % wt**	0.298 g
Pb-8	Mint Green Paint	5th Floor Elevator Entry	**4.6 % wt**	0.0957 g
Pb-9	Green/White Paint	Basement on Granite Walls	**5.1 % wt**	0.02775 g

Results above EPA LBP (>1mg/cm2 or >0.5%wt by wt)

Seven (7) of the nine (9) representative samples were identified with lead concentrations **above** the EPA criteria for lead-based paint. The only paint sampled which did not contain lead above the EPA definition for LBP was the white paint on the ceiling of the carriage and the black paint on the elevator threshold to the carriage. All other paint including surrounding plaster walls, decorative paneling above the elevator entrance, elevator doors and paneling (at each floor entrance), brick shaft walls, and the basement granite foundation walls were identified as LBP. Given that seven (7) of the nine (9) samples were identified as LBP, it is recommended that all painted surfaces associated with the building materials (elevator entry doors, decorative trim, plaster walls, and paneling on each floor) and painted interior shaft be assumed to be lead containing and proper OSHA protocols for handling of lead-based paint should be followed during any disturbance of these materials.

3.0 ESTABLISH THE WORK ZONE

Solid critical barriers should be established at the perimeter of the work zone to effectively segregate the areas where disturbance of lead-based paint will occur. These barriers shall be sufficiently constructed to

prevent dust migration from the area where paint disturbance is occurring and areas outside of the work zone. Components within the work zone which are proposed to remain shall be protected during the demolition work. During demolition dust may not be allowed to migrate from the work zone. The owner's representative has the right to halt work if dust is observed outside the work zone, or if the contractor is generating excessive dust during demolition or work disturbing painted surfaces.

4.0 PROTECTING WORKERS

Employers are required to protect workers from lead exposure under OSHA lead standards covering general industry (29 CFR 1910.1025) and construction (29 CFR 1926.62). The lead standards establish a Permissible Exposure Limit (PEL) of 50 micrograms of lead per cubic meter of air (µg/m3) sampled over an eight-hour time- weighted average for all workers covered. These standards also include an action level of 30 µg/m3, where the employer must implement specific compliance activities.

Worker protection involves engineering controls, work practices and personal protective equipment (PPE). Engineering controls include isolating the exposure source and/or using other engineering methods, such as general room or local exhaust ventilation on power tools such as sanders, grinders, and saws, to minimize exposure to lead. When lead exposures are above the PEL, employers are required to provide, at no cost to the workers, protective clothing and equipment as well as cleaning, laundering, or disposal of that protective clothing and equipment.

5.0 METHODS TO PREVENT OR REDUCE WORKER LEAD EXPOSURE

- Per OSHA lead standards, employers must conduct an exposure assessment to initially determine if any worker may be exposed to lead at or above the action level.
- Leave lead where it is. For example, it may be safer to seal old lead-containing paint underneath new, non-lead-containing paint.
- Remove and replace items with lead-containing paint rather than trying to chip, sand, or otherwise remove the paint.
    - Drilling through painted surfaces may be conducted utilizing shaving cream within a cupped attachment to the drill. The shaving cream method allows for dust generated during drilling to be captured in the shaving cream.
- Wet surfaces (e.g. painted surfaces) before and during work (e.g., scraping, sanding) that might create lead-containing dust to help prevent workers from inhaling or ingesting lead (this reduces but does not completely prevent exposures).
- Ensure work areas are well ventilated. This may be accomplished simply by opening doors and windows when working inside a closed structure. Local ventilation equipment may also be needed.
- Avoid dry and wet sweeping, shoveling or brushing dust that may contain lead. Only use a vacuum that is equipped with a high efficiency particulate air (HEPA) filter for cleanup activities
- Conduct air monitoring to ensure workers are not exposed above the OSHA PEL. Take appropriate actions if worker exposures exceed the action level (30 µg/m3) for more than 30 days per year.

- Provide workers with appropriate PPE, including fit-tested, NIOSH-approved respirators, and ensure workers clean contaminated PPE after each use. The use of respirators requires compliance with the OSHA respiratory protection standard (29 CFR 1910.134).
- Wear outer clothing that can be disposed of or washed (separately) after completing work.
- Provide training for workers on the hazards of lead and how they can protect themselves before being exposed.
- Ensure that food or beverages are not present or consumed, tobacco products are not present or used, and cosmetics are not applied in areas where workers may be exposed to lead.
- Ensure that workers wash their hands and face prior to eating, drinking or applying cosmetics.
- Inform medical professionals of work activities involving lead or potential lead exposure.

6.0 METHODS TO PREVENT TAKING LEAD HOME FROM WORK

- Wash hands and face often and shower at the end of the work shift.
- Change out of work clothes and shoes before going home. Always wear clean, uncontaminated clothing and shoes at home.
- Do not take contaminated work clothing or shoes home. If necessary, put contaminated clothing/shoes in a plastic bag or other closable container. Do NOT wash contaminated work clothes with personal clothing.

7.0 DECONTAMINATION

- Hand washing with standard soap and water is recommended by OSHA and NIOSH. However, specialized lead removal products should also be considered by employers, particularly if dust or paint is found to have high lead concentrations. Products are available that reveal lead contamination on hands/surfaces, and that remove lead residues from skin.
- Employers must provide workers with a way to discard disposable work clothing or store contaminated clothing in a closable container that will prevent lead dust from getting outside of the container. If work clothing is heavily contaminated with lead-containing dust, a vacuum equipped with a HEPA filter can be used to vacuum workers' clothes before removal to prevent dust being shaken off during removal of clothing.
- Respirators must not be removed until entering a clean area. Respirators must also be cleaned after every use. If workers may be exposed to higher levels of lead, shower facilities and a change-out room that has separate storage for clean street clothes and soiled work clothing must be made available. There are products available to prevent lead dust from being tracked though clean areas, like sticky mats that remove dust and dirt from the bottom of workers' shoes.
- Upon completion of the work which is disturbing lead paint, surfaces shall be wet wiped, and HEPA vacuumed.

8.0 DISPOSAL

All demolition debris, PPE, and associated waste generated as part of the demolition shall be properly containerized, handled, and labeled in accordance with all local, state and federal regulations pertaining to transportation and disposal. Specifically, demolition waste streams require toxicity characteristic leaching procedure (TCLP) testing for lead to determine ultimate disposal needs. The contractor shall provide copies of the testing results and final waste manifests to the owner and owner's representative demonstrating that the waste was properly disposed of at an appropriately licensed disposal facility.

Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Brenda Eastman
Environmental Lead Detection, Inc.
Lead Inspector #00044

Jeffrey D'Arrigo
SAGE Environmental, Inc.
Department Manager

ATTACHMENT 1

October 11, 2024

Bryan Buckley
Signal Works
11 Aleppo Street
Providence, RI 02909
Sent via email: bryan@signalworksarchitecture.com

RE: Limited Hazardous Materials Survey for Elevator Upgrades
25 Dorrance Street
Providence, Rhode Island
SAGE Job No. A373

Dear Mr. Buckley:

This correspondence is intended to summarize the results of requested environmental services performed by SAGE Environmental, Inc. (SAGE) at the referenced property (hereinafter, Site). Specifically, the services included:

- A limited pre-renovation survey for **ACMs[1];**
- Lead based paint; and
- Polychlorinated biphenyls (PCBs).

These services were performed at the above-referenced property (the "Site") and results are provided in the following sections.

1.0 BACKGROUND

It is SAGE's understanding that the City of Providence is currently seeking to replace an existing elevator in the historic Providence City Hall building. The current elevator in "shaft 2" is quite old and has required significantly increased maintenance over the last several years. The City is seeking a new, modern elevator similar to the one installed in 2023 in "shaft 1". SAGE reviewed the elevator shaft, carriage, and associated elevator components with your team to determine the extent of disturbance required for the installation. The sampling scope of work was developed based on this review.

[1] **ACM**= Asbestos Containing Materials (i.e., materials identified to contain asbestos at greater than 1%)

2.0 ASBESTOS SCOPE OF WORK

As requested, SAGE conducted an inspection and sampling of representative materials which are most likely to be impacted during elevator replacement. Samples were collected from accessible areas and destructive sampling was limited to inconspicuous areas to the extent possible.

The asbestos survey was completed in general accord with the **RIDOH**[2]**, EPA NESHAP**[3]**,** and **OSHA**[4] asbestos regulations.

Based on review of the scope the following materials were identified which may contain asbestos:

- Plastering (rough coat and skim coat)
- Mastics (glues)
- Resilient floor covering
- Masonite pressed board
- Masonry cement

2.1 Asbestos Bulk Sampling and Analytical Results

SAGE's Michael Podany, a RIDOH licensed asbestos inspector (AI01210), conducted inspection and bulk sampling of suspect materials at the Site building on October 4, 2024.

A total of sixteen (16) bulk samples were collected from suspect materials throughout the elevator system and submitted to Asbestos Identification Laboratory, of Woburn, Massachusetts, an EPA-accredited and RIDOH-licensed analytical laboratory for analysis for asbestos by **PLM**[5].

The laboratory certificates of analysis associated with these samples, including Chain-of-Custody documentation and a full sample log of materials tested are included in **Attachment 1**.

None of the bulk samples were identified as ACM (i.e., materials containing asbestos greater than 1%).

3.0 LEAD BASED PAINT SAMPLING AND ANALYTICAL RESULTS

SAGE also collected representative paint chip samples from painted surfaces observed within the elevator system where disturbance may occur on September 11, 2024. Lead paint sampling was conducted for informational purposes and was not intended to satisfy compliance or previous enforcement issues. Samples were taken from gold, beige, black, yellow, white, grey, and green painted surfaces which are assumed to be layered. Painted surfaces were scraped down to the underlying building material substrate utilizing a clean utility knife and flat head screwdriver. Paint chips were placed in dedicated plastic sample bags. A total of nine (9) paint chip samples were collected from the areas slated for disturbance. The samples were transported with chain of custody to EMSL Analytical Laboratory in Cinnaminson, NJ for lead analysis via flame atomic absorption via EPA method 7000B.

[2] **RIDOH** = Rhode Island Department of Health, Rules and Regulations for Asbestos Control [R23-24.5-ASB], as amended.
[3] **EPA NESHAP =** Environmental Protection Agency NESHAP regulation 40 CFR 61 Subpart M—National Emission Standard for Asbestos.
[4] **OSHA** = US Dept. of Labor, Occupational Health and Safety Administration - 29 CFR 1926.1101 Asbestos.
[5] **PLM =** Polarized Light Microscopy (EPA 600/R-93/116 Method).

EPA defines lead-based paint as paint containing lead levels greater than 1.0 milligram per square centimeter (mg/cm2), or more than 0.5% weight by weight. Results of the nine (9) paint samples are summarized in **Table 1** below.

Table 1
Lead Results Summary
September 11, 2024
27 Dorrance Street
East Providence, RI

Sample ID	Sample Description	Sample Location	Lead Results % Weight	Lead Results Weight (g)
Pb-1	Gold Paint on Metal	1st Floor Elevator Entry	**0.52 % wt**	0.2458 g
Pb-2	Beige Paint	1st Floor Elevator Entry	**0.52 % wt**	0.256 g
Pb-3	Black Paint Threshold	1st Floor Elevator Entry	0.022 % wt	0.2563 g
Pb-4	Yellow Paint	1st Floor Elevator Interior Shaft	**13 % wt**	0.2553 g
Pb-5	Yellow Paint	Basement Elevator Interior Shaft	**3.2 % wt**	0.2693 g
Pb-6	White Paint	Elevator Carriage Ceiling	0.018 % wt	0.2644 g
Pb-7	Grey Paint	Elevator Shaft Penthouse	**18 % wt**	0.298 g
Pb-8	Mint Green Paint	5th Floor Elevator Entry	**4.6 % wt**	0.0957 g
Pb-9	Green/White Paint	Basement on Granite Walls	**5.1 % wt**	0.02775 g

Results above EPA LBP (>1mg/cm2 or >0.5%wt by wt)

Seven (7) of the nine (9) samples were identified with lead concentrations **above** the EPA criteria for lead-based paint. The laboratory analytical reports are included in **Attachment 2.** The only paint sampled which did not contain lead above the EPA definition for LBP was the white paint on the ceiling of the carriage and the black paint on the elevator threshold to the carriage. All other paint including surrounding plaster walls, decorative paneling above the elevator entrance, elevator doors and paneling (at each floor entrance), brick shaft walls, and the basement granite foundation walls were identified as LBP.

Given that seven (7) of the nine (9) samples were identified as LBP, it is recommended that all painted surfaces associated with the building materials (elevator entry doors, decorative trim, plaster walls, and paneling on each floor) and painted interior shaft be assumed to be lead containing and proper OSHA protocols for handling of lead-based paint should be followed during renovation. The contractor performing demolition and disturbance of lead painted surfaces should be trained and perform work in accordance with OSHA 29 CFR 1926.62 for lead in construction standards. This includes proper training, monitoring, handling, and disposal of lead-based paint which may be disturbed and generated as part of this project.

The carriage structure itself did not have paint that was identified as LBP.

4.0 PCB SURVEY

Additionally, SAGE reviewed the project area for potential materials which may contain PCBs. Potential sources of PCBs identified include hydraulic oils associated with the elevator equipment in the

basement. While the elevator is still operational and active, SAGE did not attempt to drain or access oil reservoirs observed within the various hydraulic components in the basement.

Prior to demolition and removal of the equipment, the oil which is drained from this equipment should be properly drummed and profiled for PCBs prior to disposal. Precautions and care shall be taken when draining this oil as to not spill or contaminate surrounding areas should the oil be found to contain PCBs. The contractor selected for removal of this equipment should be familiar with the equipment and know how to properly drain the oil filled components. At a minimum, proper Personal Protective Equipment (PPE) and spill prevention materials should be utilized during this process in the event of spillage.

5.0 LIMITATIONS AND CONDITIONS

This report has been completed based on visual and physical observations made and information available at the time of the Site visit. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the Client. Any additional data obtained by further review must be reviewed by SAGE, and the conclusions presented herein may be modified accordingly. Recommendations are preliminary and should be modified to address future plans for building. This survey was limited to the area discussed herein and more specifically, the elevator system proposed for replacement.

This report and attachments, prepared for the exclusive use of Client, and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from SAGE, except that this report may be conveyed in its entirety to parties associated with the project for this subject study.

SAGE will not be held responsible, however, for the discovery of additional regulated materials that may be located in areas that are not reasonably accessible for inspection or outside the scope of this evaluation. This report does not qualify compliance by current or past owners with federal, state, or local regulations in regard to management or acknowledgment of hazardous materials at the property presently or in the past. This report does not claim that all potential hazardous materials have been detected or elect that the building is free or has been fully characterized of all suspect materials.

All samples obtained and information provided in this report were based on the current condition of the Site buildings at the time of inspection and does not account for potential changes in existing conditions of prior conditions at the property. Should current conditions change and new discoveries be made at the Site which warrant additional investigation, modifications and additional analytical reports should be furnished accordingly for the property.

If we can be of further assistance or should you have any questions pertaining to the information provided in this summary report, please contact either of the undersigned.

Sincerely,
SAGE Environmental, Inc.

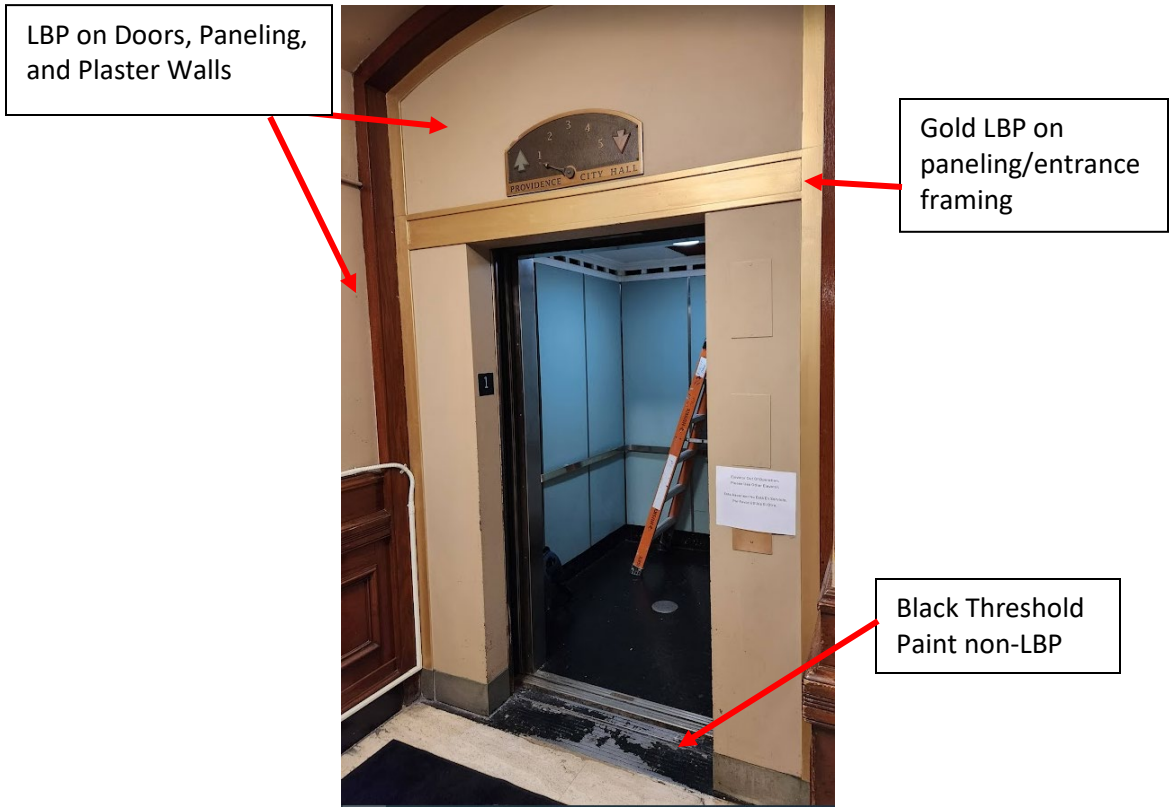
Jeffrey D'Arrigo
Senior Project Manager
RI Licensed Asbestos Inspector #AI00853

JD:jpl

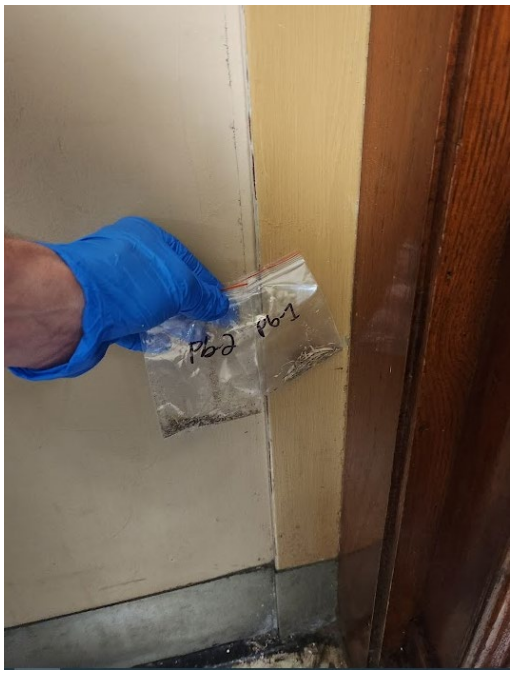
Attachments:
Photograph Appendices
Attachment 1 Asbestos Analytical Report
Attachment 2 Lead Analytical Report

PHOTOGRAPHS

Photograph Appendix



View of Elevator Slated for Replacement – Lead Based Paint Confirmed Locations



Positive LBP samples from elevator entry panels and trim.

Black threshold paint non-LBP.

Masonite paneling at interior shaft. Paneling and glue negative for asbestos.

Interior painted brick shaft. Paint is positive as LBP.

Interior carriage paint non-LBP.

Potential PCB containing oil reservoir example.

Potential PCB containing oil reservoir example.

White and Green basement paint identified as LBP.

ATTACHMENT 1

Asbestos Identification Laboratory.

165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600

Web: www.asbestosidentificationlab.com Email: mikemanning@asbestosidentificationlab.com

NVLAP® Testing Lab Code: 200919-0

Batch: 124605

Jeffrey D'Arrigo
Sage Environmental, Inc.
301 Friendship St.
Providence, RI 02903

Project Information

A373

25 Dorrance St,
City Hall,
Providence,
RI.

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

Dear Jeffrey D'Arrigo,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project. The Analysis Method is BULK PLM ANALYSIS, EPA/600/R-93/116The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.
Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Information provided by the customer can affect the validity of results. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. All customer information will be maintained in confidentiality. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Jeffrey D'Arrigo for your business.

Michael Manning
Owner/Director

Jeffrey D'Arrigo
Sage Environmental, Inc.
301 Friendship St.
Providence, RI 02903

Project Information
A373
25 Dorrance St,
City Hall,
Providence,
RI.

Method: BULK PLM ANALYSIS, EPA/600/R-93/116

FieldID LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1A 1379885	White Plaster	1st Floor Elevator Entrance	white	Non-Fibrous 100	None Detected
2A 1379886	Gray Plaster	Under 1A	gray	Non-Fibrous 100	None Detected
1B 1379887	White Plaster	3rd Floor Elevator Entrance	white	Non-Fibrous 100	None Detected
2B 1379888	Gray Plaster	Under 1B	gray	Non-Fibrous 100	None Detected
1C 1379889	White Plaster	5th Floor Elevator Entrance	white	Non-Fibrous 100	None Detected
2C 1379890	Gray Plaster	Under 1C	gray	Non-Fibrous 100	None Detected
3A 1379891	Black Plastic Flooring	Elevator Floor	black	Non-Fibrous 100	None Detected
3B 1379892	Black Plastic Flooring	Elevator Floor	black	Non-Fibrous 100	None Detected
4A 1379893	Gray Mastic	Under 3A	gray	Non-Fibrous 100	None Detected
4B 1379894	Gray Mastic	Under 3B	gray	Non-Fibrous 100	None Detected
5A 1379895	Brown Masonite	5th Floor Elevator Shaft	brown	Cellulose 80 Non-Fibrous 20	None Detected
5B 1379896	Brown Masonite	5th Floor Elevator Shaft	brown	Cellulose 80 Non-Fibrous 20	None Detected
6A 1379897	Dark Brown Mastic	Behind 5A	black	Non-Fibrous 100	None Detected
6B 1379898	Dark Brown Mastic	Behind 5A	black	Non-Fibrous 100	None Detected
7A 1379899	Masonry Cement	Elevator Pit Wall	multi	Non-Fibrous 100	None Detected
7B 1379900	Masonry Cement	Elevator Pit Wall	multi	Non-Fibrous 100	None Detected

Sampled: October 04, 2024 **Received:** October 07, 2024 **Analyzed:** October 07, 2024

Wednesday 09 October

Analyzed by: Michael Manning **Batch:** 124605

Client: SAGE Environmental

Address: 301 Friendship St, Providence RI

Project Site & #: A373 25 Dorrance St, City Hall, Providence, RI

Phone / email address: 203-837-0167 mpodany@sage-enviro.com

Contact: M. Podany

Relinquish by/date: [signature] 10/4/24

Received by/date: [signature]

# of Samples Received: 16

CHAIN OF CUSTODY

EPA/600/R-93/116

Asbestos Identification Lab

165 New Boston St.

Suite 227

Woburn, MA 01801

(781)932-9600

www.asbestosidentificationlab.com

Date Sampled: Oct 4th, 2024

BATCH# 124605 Rev 07/24

Turnaround Time

- [ ] Less 3 Hrs
- [ ] Same Day
- [ ] Next Day
- [x] Two Day
- [ ] Three Day

Sample Method

- [x] Bulk
- [ ] Soil
- [ ] Wipe
- [ ] Point Count
- [ ] NOB

Stop on 1st Positive? Yes/No

Analyzed By: Vittorio

Date: 10/7/24

Temp in Celsius = 25

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
1379885	1A	Material: White Plaster Location: 1st Floor elevator entrance	0	W	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
86	2A	Material: Gray Plaster Location: under 1A	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
87	1B	Material: same as 1A Location: 3rd Floor elevator entrance	0	W	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
88	2B	Material: same as 2A Location: under 1B	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
89	~~3A~~ 1C	Material: same as ~~3A~~ 2A Location: 5th Floor elevator Entrance	0	W	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
90	~~3B~~ 2C	Material: same as 2A Location: under 1C	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
91	3A	Material: Black Plastic Flooring Location: Elevator Floor	0	BK	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
92	3B	Material: same as 3A Location: same as 3A	0	BK	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope					Asbestos Minerals	Optical Properties						RI		Non-Asbestos Percentage (%)						
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	∥	⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
93	4A	Material: Gray Mastic Location: under 3A	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
94	4B	Material: same as 4A Location: under 3B	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100
95	5A	Material: Brown Masonite Location: 5th Floor elevator shaft	0	BR	Y	F	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											80				20
96	5B	Material: same as 5A Location: same as 5A	0	BR	Y	F	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite											80				20
97	6A	Material: Dark Brown Mastic Location: behind 5A	0	BK	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															100

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ / Material / Location	Stereomicroscope					Asbestos Minerals	Optical Properties						RI		Non-Asbestos Percentage (%)						
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	∥	⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
98	6B	Material: same as 6A Location: same as 6A	0	BK	V	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															100
								Actinolite															
99	7A	Material: Masonry Cement Location: Elevator p.4 wall	0	M	N	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															100
								Actinolite															
137900	7B	Material: same as 7A Location: same as 7A	0	M	N	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															100
								Actinolite															
		Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															
		Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															

ATTACHMENT 2

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012431207
LIMS Reference ID: AC31207
EMSL Customer ID: SAGE53

Attention: _All Reports
Sage Environmental, Inc. [SAGE53]
301 Friendship St
Providence, RI 02903
(401) 723-9900
sage@sage-enviro.com

Project Name: A373 // 25 Dorrance St., City Hall, Providence, RI
Customer PO: A373
EMSL Sales Rep: David Prince
Received: 09/23/2024 09:15
Reported: 09/26/2024 16:44

Analytical Results

Analyte	Results	RL	Weight(g)	Prep Date & Tech	Prep Method	Analysis Date & Analyst	Analytical Method	Q	DF
Client Sample ID: Pb - 1/Gold Paint on Metal - 1st Floor Elevator Entry									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-01**
Lead	0.52 % wt	0.041 % wt	0.2458	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	5
Sample Comments:									
Client Sample ID: Pb - 2/Beige Paint - 1st Floor Elevator Entry									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-02**
Lead	0.52 % wt	0.039 % wt	0.256	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	5
Sample Comments:									
Client Sample ID: Pb - 3/Black Paint Threshold - 1st Floor Elevator Entry									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-03**
Lead	0.022 % wt	0.008 % wt	0.2563	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B		1
Sample Comments:									
Client Sample ID: Pb - 4/Yellow Paint - 1st Floor Elevator - Interior Shaft									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-04**
Lead	13 % wt	1.6 % wt	0.2553	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	200
Sample Comments:									
Client Sample ID: Pb - 5/Yellow Paint - 1st Floor Elevator - Interior Shaft Basement									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-05**
Lead	3.2 % wt	0.19 % wt	0.2693	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	25
Sample Comments:									
Client Sample ID: Pb - 6/White Paint - Elevator Carriage Ceiling									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-06**
Lead	0.018 % wt	0.008 % wt	0.2644	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B		1
Sample Comments:									
Client Sample ID: Pb - 7/Gray Paint - Elevator Shaft Penthouse									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-07**
Lead	18 % wt	1.3 % wt	0.298	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	200
Sample Comments:									
Client Sample ID: Pb - 8/Mint Green Paint - Elevator Entry 5th Floor									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-08**
Lead	4.6 % wt	0.21 % wt	0.0957	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	10
Sample Comments:									
Client Sample ID: Pb - 9/Green/White - Basement on Granite Walls									**Date Sampled: 09/11/24**
Matrix: Chips									**LIMS Reference ID: AC31207-09**
Lead	5.1 % wt	0.36 % wt	0.2775	09/26/24 LP	SW-846 3050B	09/26/24 PMX	SW846-7000B	D	50
Sample Comments:									

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012431207
LIMS Reference ID: AC31207
EMSL Customer ID: SAGE53

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301 Friendship St
Providence, RI 02903
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sage@sage-enviro.com

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Certified Analyses included in this Report

Analyte	Certifications
SW846-7000B in Chips	
Lead	AIHA LAP

List of Certifications

Code	Description	Number	Expires
NJDEP	New Jersey Department of Environmental Protection	03036	06/30/2025
AIHA LAP	EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC-ELLAP Accredited	100194	01/01/2025
NYSDOH	New York State Department of Health	10872	04/01/2025
California ELAP	California Water Boards	1877	06/30/2025
A2LA	A2LA Environmental Certificate	2845.01	07/31/2026
PADEP	Pennsylvania Department of Environmental Protection	68-00367	11/30/2024
MADEP	Massachusetts Department of Environmental Protection	M-NJ337	06/30/2025
CTDPH	Connecticut Department of Public Health	PH-0270	06/23/2026

Please see the specific Field of Testing (FOT) on www.emsl.com <http://www.emsl.com> for a complete listing of parameters for which EMSL is certified.

Notes and Definitions

Item	Definition
D	Analyte was reported from a dilution run.
(Dig)	For metals analysis, sample was digested.
[2C]	Reported from the second channel in dual column analysis.
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
NR	Spike/Surrogate showed no recovery.
Q	Qualifier
RL	Reporting Limit For paint chips, the RL is 0.008% by wt. (equiv. to 80 mg/kg, or ppm) based upon a minimum sample weight of 0.25 grams. For soils, the RL is 40 mg/kg (ppm) based upon a minimum sample weight of 0.5 grams. For dust wipes, the RL is 10 µg/wipe; reporting units of µg/sq. ft. are not validated by the lab based upon data provided by non-lab personnel.
Wet	Sample is not dry weight corrected.

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.

EMSL Analytical, Inc.

200 Route 130, Cinnaminson, NJ, 08077
Telephone: 856-858-4800 Fax:856-786-5974
EMSL-CIN-01

EMSL Order ID: 012431207
LIMS Reference ID: AC31207
EMSL Customer ID: SAGE53

Attention: _All Reports
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sage@sage-enviro.com

Project Name: A373 // 25 Dorrance St., City Hall, Providence, RI

Customer PO: A373
EMSL Sales Rep: David Prince
Received: 09/23/2024 09:15
Reported: 09/26/2024 16:44

Owen McKenna Laboratory Manager or other approved signatory

Analysis following EMSL SOP for the Determination of Environmental Lead by FLAA. The laboratory has a reporting limit of 0.008% by wt., based upon a minimum sample weight of 0.25g submitted to the lab, and is not responsible for any result or reporting limit provided in mg/cm2 since it is dependent upon an area value provided by non-lab personnel. A "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty and definitions of modifications are available upon request. Results in this report are not blank corrected unless specified.

OrderID: 042419174

09/11/24

AC31207

SAMPLE DATA SHEET

Property/Survey Area: 75 Dorrance Street, City Hall, Providence RI PURCHASE ORDER #: A373

SAMPLED BY: JD SAGE PROJECT NUMBER: A373

DATE: 9/11/24 PAGE 1 OF 1

Line	Sample #	Description	Location	TYPE/Condition
1	Pb-1	Gold paint on metal	1st Elevator Entry. Floor	
2	Pb-2	Beige Paint	↓	
3	Pb-3	Black paint threshold.		
4	Pb-4	Yellow Paint	1st Floor elevator interior Shaft.	
5	Pb-5	"	" Basement	
6	Pb-6	White Paint	Elevator Carriage ceiling.	
7	Pb-7	grey paint	Elevator Shaft Penthouse	
8	Pb-8	Mint Green Paint	Elevator Entry 5th Floor	
9	Pb-9	green/white	Basement on granite walls	
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20		* Test Flame AA or ICP (?)		
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

RECEIVED EMSL ANALYTICAL, INC. SEP 16 A 10:48

COMMENTS:

A. (1) Analysis = [X] PLM, Asbestos (EPA 600/R-93/116); [ ] PLM NOB; [ ] _____ point count; [ ] TEM NOB
(2) TAT = 1 hour - day - week (3) No. samples submitted = 9 ; (4) (Y) or N - Positive stop by Homogeneous # shown

B. (1) Analysis= [ ] Pb paint chips % by wt. (EPA SW846-7000B); (2) TAT= _____ hour - day - week

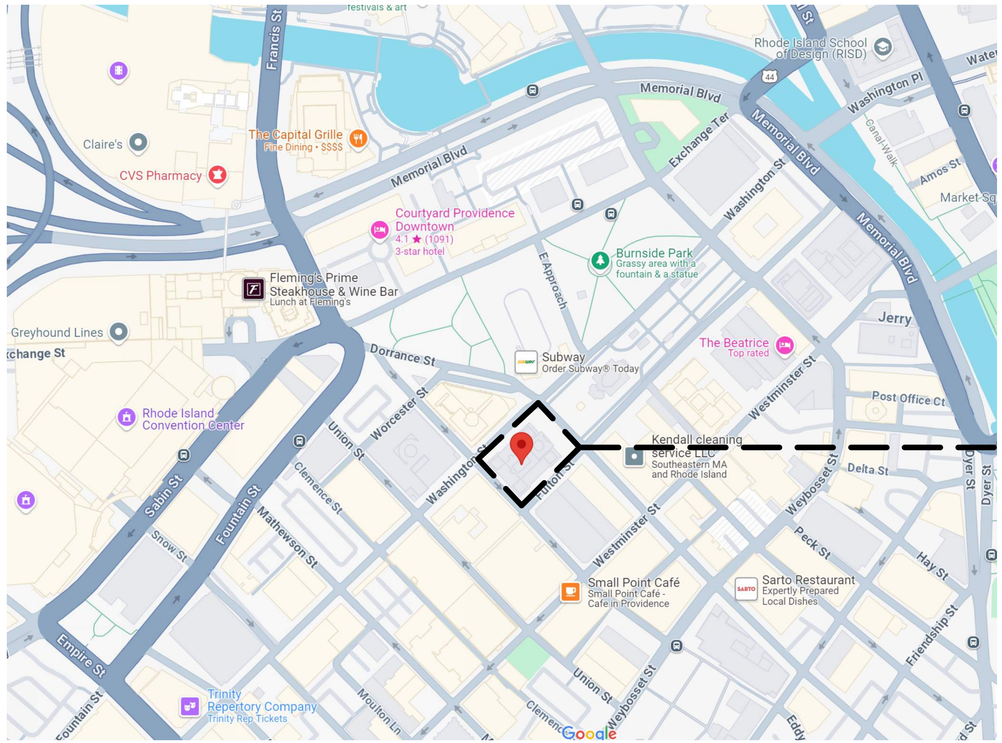
C. (1) Analysis = [ ] PCB caulk (EPA 3540C/8082A); (2) TAT = _____ hour - day - week

D. Email report to sage@sage-enviro.com

RELINQUISHED BY: (SIGNATURE)	DATE	RECEIVED BY: (SIGNATURE)	DATE
	9/13/24	EMSL FX	9/16/24 9:00

C:\Users\jdarrigo.SAGE\Box\Misc_Resources\Templates\EMSL Sample Data Sheet\2019 EMSL Asbestos Sample Sheet Revised.docx

9 TD



LOCUS MAP N

BUILDING SITE

PROVIDENCE CITY HALL ELEVATOR REPLACEMENT

25 DORRANCE STREET
PROVIDENCE, RI 02903

MAP: 20 / LOT: 38

DRAWING LIST

SHEET NUMBER	DRAWING NAME	REVISION
CS	COVER SHEET	
S1.0	NOTES	
S.1.1	STRUCTURAL PLANS	
S2.1	DETAILS	
A0.1	GENERAL NOTES	
AD1.1	DEMOLITION FLOOR PLANS	
AD1.2	DEMOLITION FLOOR PLANS	
AD3.1	DEMOLITION SECTIONS	
AD4.1	DEMOLITION INTERIOR ELEVATIONS	
AD4.2	DEMOLITION INTERIOR ELEVATIONS	
A1.1	PROPOSED FLOOR PLANS	
A1.2	PROPOSED FLOOR PLANS	
A3.1	PROPOSED SECTIONS	
A4.1	PROPOSED INTERIOR ELEVATIONS	
A4.2	PROPOSED INTERIOR ELEVATIONS	
P0.1	PLUMBING LEGEND, GENERAL NOTES AND BASEMENT PART PLAN	
M0.1	MECHANICAL LEGENDS & NOTES	
MD1.1	MECHANICAL EXISTING/DEMO FLOOR PLANS	
M1.1	MECHANICAL PART PLANS	
M1.2	MECHANICAL PART PLANS	
M2.1	MECHANICAL SCHEDULES & DETAILS	
E0.1	ELECTRICAL LEGENDS & NOTES	
ED1.1	ELECTRICAL EXISTING/DEMO FLOOR PLANS	
E1.1	ELECTRICAL PROPOSED FLOOR PLANS	
E1.2	ELECTRICAL PROPOSED FLOOR PLANS	
E2.1	ELECTRICAL SCHEDULES & DETAILS	

ZONING SUMMARY

PLAT/LOT:	20 - 38
USEAGE:	D-1-120
MAX HEIGHT:	120'
MAX BUILDING FOOTPRINT:	NONE
FRONT SETBACK:	0' - 8'
SIDE SETBACK:	0'
SIDE REAR SETBACK:	0'
AUTOMOBILE PARKING:	DISCOURAGED PER ZONING DESIGNATION
DESIGNATIONS:	THE SITE IS IN THE DOWNCITY DISTRICT OVERLAY DISTRICT. THE BUILDING ITSELF IS ON THE NATIONAL HISTORIC REGISTER.

PROJECT DESCRIPTION

THIS PROJECT IS FOR THE REMOVAL & REPLACEMENT OF "ELEVATOR #2". EXISTING SHAFT TO REMAIN. MODIFICATIONS TO SHAFT WILL BE AS NECESSARY TO ACCOMODATE NEW ELEVATOR. ADDITIONAL WORK TO INCLUDE THE EXPANSION OF THE EXISTING ELEVATOR MACHINE ROOM. INTERIOR FINISH WORK TO INCLUDE THE ELEVATOR LOBBIES AT EACH FLOOR TO PRESERVE HISTORICAL DETAILS.

BID SET
01/17/2025

Signal Works

OWNER: CITY OF PROVIDENCE - CAPITAL IMPROVEMENT PROJECTS
25 DORRANCE STREET
PROVIDENCE, RI 02903
TEL: (401) 680-5000

ARCHITECT: SIGNAL WORKS
11 ALEPPO STREET
PROVIDENCE, RI 02909
TEL: (401) 400.ARCH

HAZMAT / ABATEMENT: SAGE ENVIRONMENTAL
301 FRIENDSHIP STREET
PROVIDENCE, RI 02903
TEL: (888) 723-9920

MEP/FP: ENGINEERING DESIGN SERVICES
141 INDUSTRIAL DRIVE
NORTH SMITHFIELD, RI 02896
TEL: (401) 765-7659

STRUCTURAL ENGINEER: STRUCTURES LLC
23 BURRILL ROAD
BURRILLVILLE, RI 02830
TEL: (401) 258-6784

RI GENERAL LAWS

23-27.3-128.3. CONSTRUCTION CONTRACTOR RESPONSIBILITIES:

THE ACTUAL CONSTRUCTION OF THE WORK SHALL BE THE RESPONSIBILITY OF THE OWNER OR THE CONTRACTOR DESIGNATED AS HIS OR HER AGENT AND WHO SHALL:

(1) PERFORM ALL WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS ON FILE WITH THE BUILDING OFFICIAL.

(2) PERFORM SPECIFIED WORK IN A SAFE AND SATISFACTORY MANNER AND IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL STATUTES AND REGULATIONS.

(3) UPON COMPLETION OF THE CONSTRUCTION, SHALL CERTIFY TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF THAT THE WORK HAS BEEN DONE IN SUBSTANTIAL ACCORD WITH SUBDIVISIONS (1) AND (2) ABOVE AND WITH ALL PERTINENT DEVIATIONS.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
B.O.F	BOTTOM OF FOOTING
CMU	CONCRETE MASONRY UNIT
DIA	DIAMETER
E.O.	EDGE OF
EQ	EQUAL
E.W.	EACH WAY
F.O.	FACE OF
FT	FOOT
GA	GAUGE
GALV	GALVANIZE
IN	INCHES
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
NTS	NOT TO SCALE
OC	ON-CENTER
PSF	POUNDS PER SQUARE FOOT
PLF	POUNDS PER LINEAR FOOT
PSI	POUNDS PER SQUARE INCH
P.T.	PRESSURE TREATED
T\B	TOP AND BOTTOM
T\G	TONGUE AND GROOVE
T.O.P.	TOP OF PIER
T.O.S.	TOP OF STEEL
T.O.S.	TOP OF SLAB
T.O.SHF	TOP OF SHELF
T.O.W.	TOP OF WALL
UNO	UNLESS NOTED OTHERWISE
WWF	WELDED WIRE FABRIC

MATERIAL KEY

#1 P.T. SYP = PRESSURE TREATED (P.T.) SOUTHERN YELLOW PINE, Fb = 1500 psi, E = 1,600,000 psi

SPRUCE-PINE-FIR #1 / #2
Fb = 875 psi, E = 1,400,000 psi

SPF = #1/#2 SPRUCE-PINE-FIR

LVL = LAMINATED VENEER LUMBER (Fb=3100 psi, E=2,000,000 psi).

PSL = PARALLEL STRAND LUMBER (COLUMN: Fb=2400 psi, E=1,800,000 psi. BEAM: Fb=2900 psi, E=2,000,000 psi)

TJI = DESIGNATION BASED ON PLYWOOD WEB JOISTS AS MANUFACTURED BY WEYERHAEUSER

HSS = HOLLOW STRUCTURAL STEEL, A500 GRADE B, 46 ksi STRUCTURAL STEEL TUBE

W = WIDE FLANGE 50 ksi STRUCTURAL STEEL

C = CHANNEL 36 ksi STRUCTURAL STEEL

L = ANGLE 36 ksi STRUCTURAL STEEL

CODE REVIEW

ALL WORK IS TO BE DONE AND LOADS TO BE DETERMINED IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:

- RHODE ISLAND BUILDING CODE, SBC-1-2021, 13th EDITION
- IBC 2018
- ASCE 7-16

GRAVITY LOADS

BASED ON ELEVATOR SHOP DRAWINGS

GENERAL NOTES

1. CONTRACTOR TO FIELD ESTABLISH ALL DIMENSIONS AND ELEVATIONS TO EXISTING STRUCTURE AND BUILDING COMPONENTS.

2. COORDINATE DIMENSIONS AND LOCATIONS OF NEW WORK WITH OTHER TRADES AND ARCHITECTURAL DRAWINGS.

3. REMOVE BUILDING COMPONENTS AND MATERIALS IN FRONT OF EXISTING BASE STRUCTURE AS REQUIRED TO INSTALL NEW WORK.

4. REMOVE, RELOCATE, AND/OR REPLACE ALL EXISTING UTILITIES OR OTHER BUILDING COMPONENTS WITHIN CEILING CAVITY AND OTHER AREAS AS REQUIRED TO INSTALL NEW WORK. COORDINATE SYSTEMS AND SEQUENCING WITH BUILDING OPERATIONS. REPLACE TO ORIGINAL WORKING ORDER.

5. REFER TO ARCHITECTURAL, ELECTRICAL, AND OTHER TRADES FOR ADDITIONAL DEMOLITION NOTES AND INFORMATION.

6. CONFIRM AND VERIFY ELEVATOR PIT AND SHAFT WALL DIMENSIONS WITH MANUFACTURER PRIOR TO ORDERING MATERIALS AND FORMING CONCRETE.

7. (E) REPRESENTS EXISTING STRUCTURAL COMPONENT

8. PROVIDE TEMPORARY SHORING OF EXISTING STRUCTURE AS REQUIRED TO COMPLETE NEW WORK.

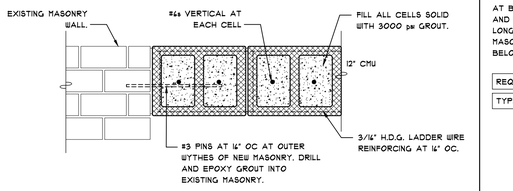
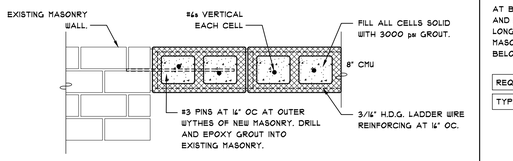
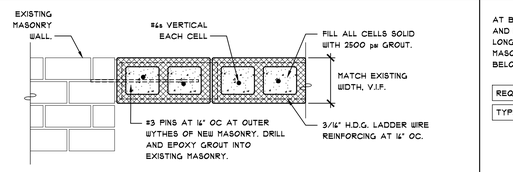
STRUCTURAL NOTES

1. REGULAR AND PERIODIC FIELD OBSERVATIONS FROM THIS OFFICE REQUIRED PER THE RHODE ISLAND CODE ARE NOT INTENDED OR REQUIRED TO ASSURE COMPLETE COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS. ANY ISSUES OBSERVED TO BE NON COMPLIANT WILL BE NOTED IN A FIELD REPORT. THE ABSENCE OF COMMENT DOES NOT EXPLICITLY OR IMPLICITLY CONVEY PROPER COMPLIANCE WITH DESIGN INTENT. IT REMAINS THE CONTRACTORS RESPONSIBILITY TO DELIVER THE PROJECT IN COMPLETE COMPLIANCE WITH STATE BUILDING CODE, LOCAL CODES AND ORDNANCES, AND CONSTRUCTION DOCUMENTS.

2. THE STRUCTURAL SCOPE OF THIS PROJECT IS SPECIFICALLY LIMITED TO PROVIDING STRUCTURAL WORK SHOWN. OVERALL STRUCTURE IS OUT OF SCOPE.

3. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO THE ARCHITECT AND ENGINEER FOR REVIEW INCLUDING THE FOLLOWING SCOPES:
   - 1.1. CONCRETE MIX DESIGN
   - 1.2. CONCRETE REINFORCING
   - 1.3. MASONRY REINFORCING
   - 1.4. MASONRY PRODUCTS
   - 1.5. STRUCTURAL STEEL

MASONRY REINFORCING SCHEDULE

MARK	PLAN DETAIL	REMARKS
M-1 ELEVATOR PIT		AT BASE AND AT TOP, DRILL AND EPOXY GROUT #5 x 24" LONG PINS INTO TOP OF MASONRY WALL ABOVE AND BELOW. SPACE PINS AT 24" OC. REQUIRED F'm=1500 psi TYPE S MORTAR
M-2 SHAFT CLOSURE WALLS		AT BASE AND AT TOP, DRILL AND EPOXY GROUT #5 x 24" LONG PINS INTO TOP OF MASONRY WALL ABOVE AND BELOW. SPACE PINS AT 24" OC. REQUIRED F'm=1500 psi TYPE S MORTAR
M-3 RECONFIGURED WALL		AT BASE AND AT TOP, DRILL AND EPOXY GROUT #5 x 24" LONG PINS INTO TOP OF MASONRY WALL ABOVE AND BELOW. SPACE PINS AT 24" OC. REQUIRED F'm=1500 psi TYPE S MORTAR

GENERAL MASONRY NOTES:

1. USE TYPE S MORTAR

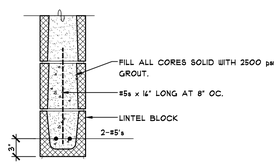
2. GROUT MIX DESIGN TO BE 3000 psi AT 28 DAYS.

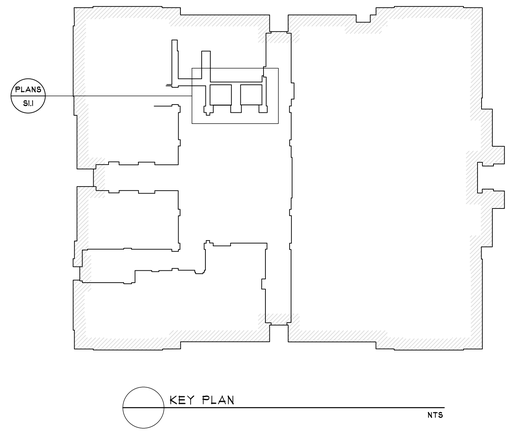
3. HIGH LIFT GROUTING IS NOT PERMITTED UNLESS PROCEDURES ARE SUBMITTED AND APPROVED BY ARCHITECT/ENGINEER. SUBMITTALS TO BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROCEDURES TO BE IN ACCORDANCE WITH ACI 530-05/ASCE 5-05/TMS 402-05 AND ACI 530.1/ASCE 6-05/TMS 602-05. MAXIMUM LOW LIFT GOUTING HEIGHT TO BE 24".

4. PLACING REINFORCING DURING HIGH LIFT GROUT POUR IS UNACCEPTABLE. REINFORCING IS TO BE SECURELY ATTACHED TO MASONRY TO ENSURE PROPER PLACEMENT DURING LOW OR HIGH LIFT GROUT OPERATIONS.

5. FOR HOT AND COLD WEATHER PLACEMENT FOLLOW PROVISIONS SPECIFIED IN ACI 530-05/ASCE 5-05/TMS 402-05 AND ACI 530.1/ASCE 6-05/TMS 602-05. CONTRACTOR TO SUBMIT CONSTRUCTION PROCEEDURES TO ARCHITECT AND ENGINEER PRIOR TO COMENCING WORK DURING THESE CONDITIONS.

LINTEL SCHEDULE

TYPE	DETAIL	REMARKS
L-1		EXTEND HORIZONTAL BARS 8" BEYOND R.O. EACH END.



SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

STRUCTURES
ENGINEERING AND DESIGN LLC
23 BURRILL RD
HARRISVILLE, RI 02830
401-258-6784
EMAIL@STRUCTURES-LLC.COM
WWW.STRUCTURES-LLC.COM

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
BID SET

DATE: 1-17-2025

PROJECT NO: 2418 (SED 24064)

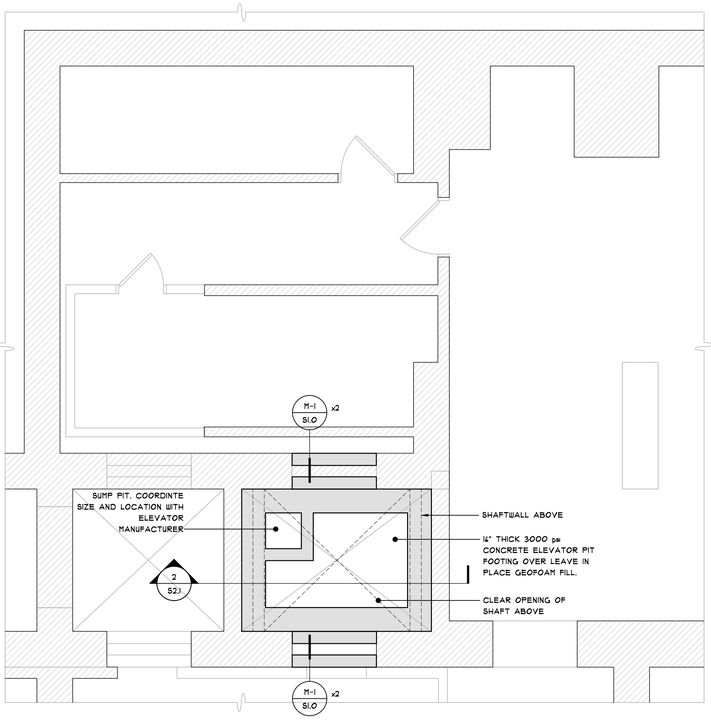
DRAWN BY: AC / JJP

CHECKED BY: JJP

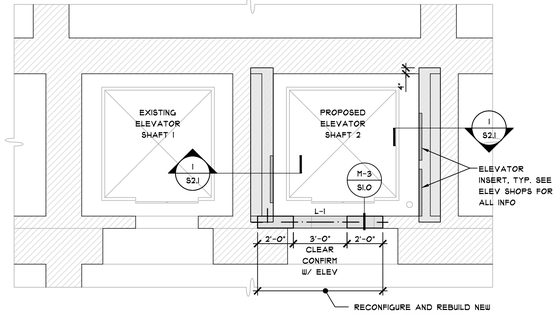
REVISIONS:

DRAWING TITLE:
NOTES

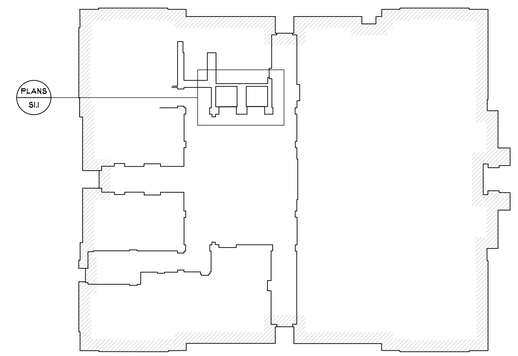
DRAWING NO.:
S1.0



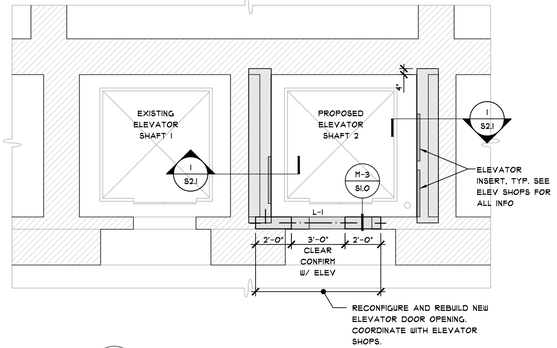
1 S1.1 ELEVATOR PIT FOUNDATION PLAN
1/4" = 1'-0"



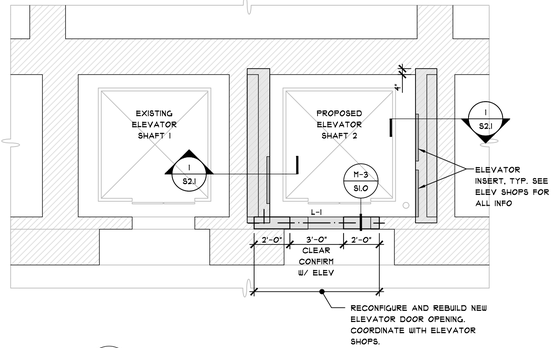
2 S1.1 FIRST FLOOR STRUCTURAL PLAN
1/4" = 1'-0"



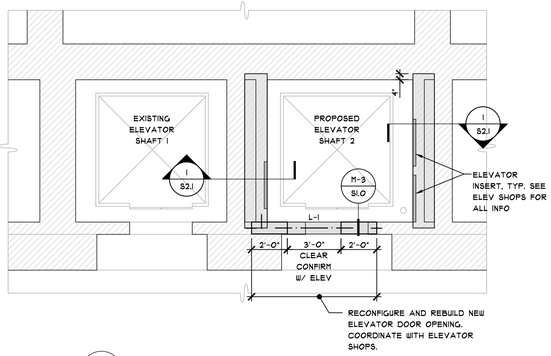
KEY PLAN
NTS



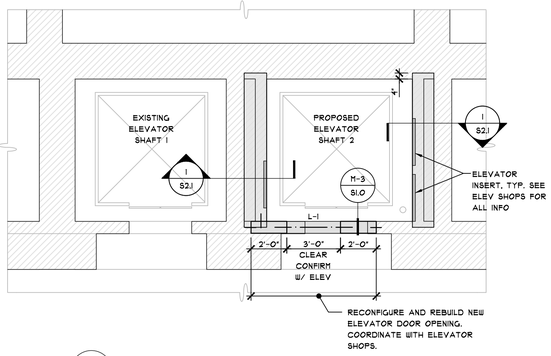
3 S1.1 SECOND FLOOR ELEVATOR PLAN
1/4" = 1'-0"



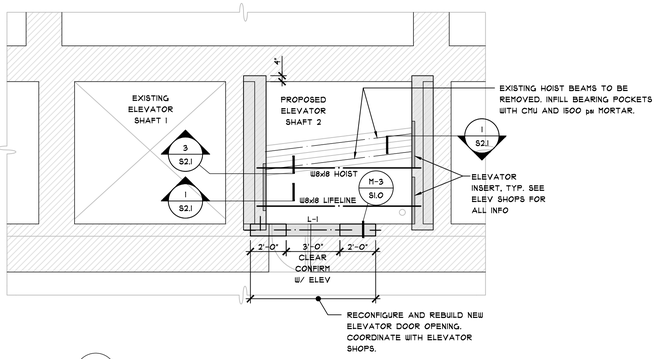
4 S1.1 THIRD FLOOR ELEVATOR PLAN
1/4" = 1'-0"



5 S1.1 FOURTH FLOOR ELEVATOR PLAN
1/4" = 1'-0"



6 S1.1 FIFTH FLOOR ELEVATOR PLAN
1/4" = 1'-0"



7 S1.1 ATTIC FLOOR ELEVATOR PLAN
1/4" = 1'-0"

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

STRUCTURES
ENGINEERING AND DESIGN LLC
23 BURRILL RD
HARRISVILLE, RI 02830
401-258-6784
EMAIL@STRUCTURES-LLC.COM
WWW.STRUCTURES-LLC.COM

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
BID SET

DATE: 1-17-2025

PROJECT NO: 2418 (SED 24064)

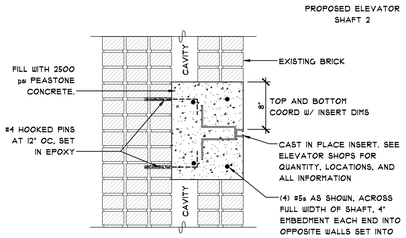
DRAWN BY: AC / JJP

CHECKED BY: JJP

REVISIONS:

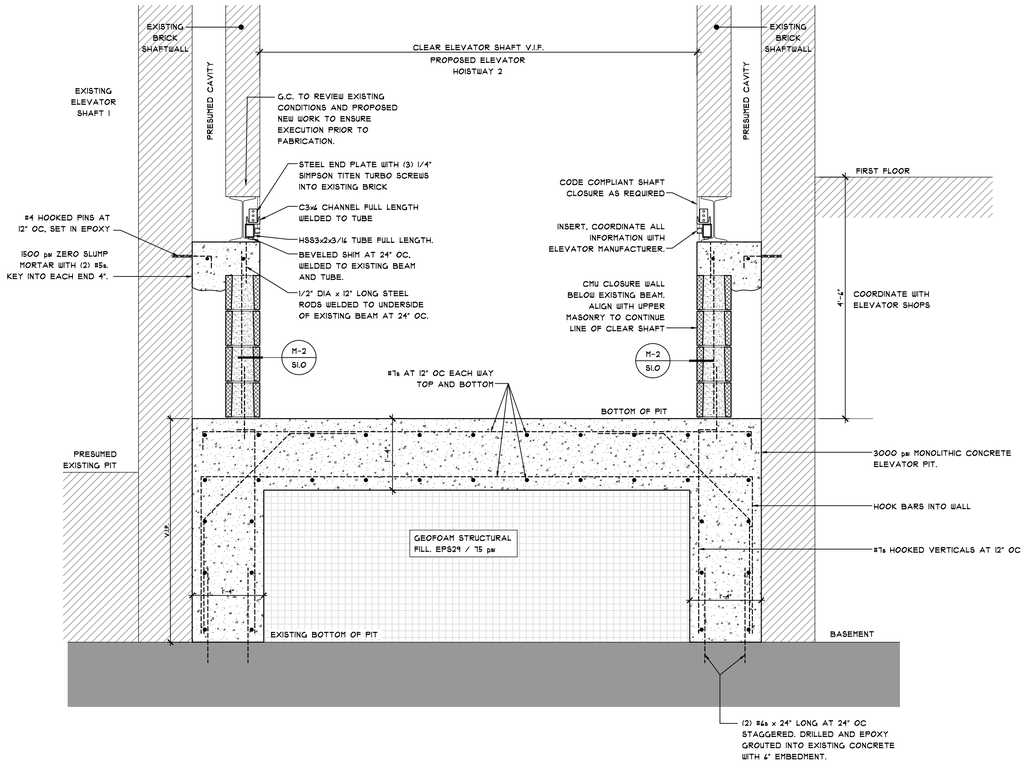
DRAWING TITLE:
STRUCTURAL PLANS

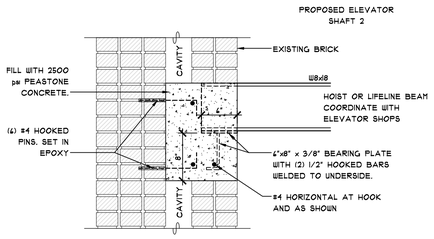
DRAWING NO.:
S1.1



THIS DETAIL APPLIES TO ALL CONDITIONS WHERE EMBEDDED ANCHOR PLATES ARE REQUIRED. COORDINATE LOCATIONS AND QUANTITIES WITH ELEVATOR SHOP DRAWINGS

1 / S2.1 SECTION DETAIL
EMBEDDED INSERT 1" = 1'-0"





3 / S2.1 SECTION DETAIL
EMBEDDED INSERT 1" = 1'-0"

2 / S2.1 SECTION DETAIL
ELEVATOR PIT 3/4" = 1'-0"

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

STRUCTURES ENGINEERING AND DESIGN LLC
23 BURRILL RD
HARRISVILLE, RI 02830
401-258-6784
EMAIL@STRUCTURES-LLC.COM
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CHECKED BY: JJP

REVISIONS:

DRAWING TITLE:
DETAILS

DRAWING NO.:
S2.1

GENERAL CONDITIONS NOTES

1. THE CONTRACTOR SHALL VISIT THE SITE AND BE FULLY COGNIZANT OF ALL EXISTING CONDITIONS PRIOR TO SUBMITTING ANY PROPOSITIONS OR BIDS. IF ANY ASBESTOS, KNOWN MATERIALS CONTAINING ASBESTOS OR ANY MATERIALS CLASSIFIED BY THE EPA AS HAZARDOUS MATERIALS ARE DISCOVERED, THEN THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE OWNER, AS REQUIRED, FOR THE REMOVAL OF THESE CONDITIONS, PRIOR TO THE BEGINNING OF THIS PROJECT. IF THE CONTRACTOR PARTICIPATES IN ANY PORTION OF THE REMOVAL PROCESS IN HIS COORDINATION WITH THE OWNER, THEN THE CONTRACTOR SHALL PROVIDE THE OWNER WITH A WRITTEN STATEMENT RELEASING THE OWNER OF ANY FUTURE LIABILITY FROM THE CONTRACTOR, HIS EMPLOYEES AND ANY SUBCONTRACTORS HIRED BY THE CONTRACTOR RELATED TO THIS WORK. THESE DRAWINGS AND SPECIFICATIONS DO NOT REPRESENT AN ASSESSMENT OF THE PRESENCE OR AN ASSESSMENT OF THE ABSENCE OF ANY TOXIC OR HAZARDOUS MATERIALS ON THIS PROJECT SITE. THE OWNERS ARE SOLELY RESPONSIBLE FOR SUCH AN ASSESSMENT AND SHOULD BE CONSULTED FOR ANY QUESTIONS THEREIN. IF THE CONTRACTOR DISCOVERS ANY TOXIC OR HAZARDOUS MATERIALS, AS DEFINED BY THE APPROPRIATE GOVERNING AUTHORITIES, IN THE COURSE OF HIS WORK, HE MUST NOTIFY THE OWNERS IN WRITING, AS PER THE GUIDELINES BY ALL GOVERNING AUTHORITIES. THE CONTRACTOR SHALL RESOLVE THE APPLICABLE REGULATIONS AND PROCEDURES WITH THE OWNER AT THE TIME OF DISCOVERY.

2. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, LAWS, ORDINANCES AND LOCAL MUNICIPAL REGULATIONS AND AMENDMENTS RELATED TO THIS PROJECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNER AT ONCE UPON DISCOVERY OF ANY CONFLICTS OR DISCREPANCIES BETWEEN THE AFOREMENTIONED AND THE WORK CONTRACTED FOR THIS PROJECT OR A CHANGE OF AN APPLICABLE CODE OR STATUE BY LOCAL AUTHORITIES.

3. THE CONTRACTOR SHALL COORDINATE AND BE RESPONSIBLE FOR ALL WORK BY HIS SUBCONTRACTORS AND THEIR COMPLIANCE WITH ALL THESE GENERAL NOTES. THE CONTRACTOR SHALL IDENTIFY ANY CONFLICTS BETWEEN THE WORKS OF THE SUBCONTRACTORS, AS DIRECTED BY THESE DRAWINGS, DURING THE LAYOUT OF THE AFFECTED TRADES. THE CONTRACTOR SHALL REVIEW THESE CONDITIONS WITH THE ARCHITECTURAL DESIGNER FOR DESIGN CONFORMANCE BEFORE BEGINNING ANY INSTALLATION.

4. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND PROPOSED DIMENSIONS AND CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNER AT ONCE UPON THE DISCOVERY OF ANY CONFLICTS OR DISCREPANCIES BETWEEN THE AFOREMENTIONED AND THE DRAWINGS AND SPECIFICATIONS OF THIS PROJECT. THE CONTRACTOR SHOULD FOLLOW DIMENSIONS AND SHOULD NOT SCALE THESE DRAWINGS. IF DIMENSIONS ARE REQUIRED BUT NOT SHOWN, THEN THE CONTRACTOR SHALL REQUEST THE DIMENSIONS FROM THE OWNER BEFORE BUILDING ANY PART OF THE PROJECT, WHICH REQUIRES THE MISSING DIMENSIONS.

5. ANY CHANGES, ALTERNATIVES OR MODIFICATIONS TO THESE DRAWINGS AND SPECIFICATIONS MUST BE APPROVED IN WRITING BY THE OWNER, AND ONLY WHEN SUCH WRITTEN APPROVAL CLEARLY STATES THE AGREED COST OR CREDIT OF THE CHANGE, ALTERNATIVE OR MODIFICATION TO THIS PROJECT. FOR INFORMATION, DRAWINGS OR OTHER DOCUMENTS, NOT SHOWN OR INCLUDED IN THE PERMIT OR CONSTRUCTION DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL REQUEST THE MISSING INFORMATION, DRAWINGS OR DOCUMENTS FROM THE OWNER BEFORE STARTING OR PROCEEDING WITH THE CONSTRUCTION AFFECTED BY THE MISSING INFORMATION, DRAWINGS OR DOCUMENTS.

6. THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS IS TO PROVIDE THE DESIGN GUIDANCE FOR THE CONTRACTOR TO REASONABLY PLAN FOR ALL ITEMS NECESSARY FOR A COMPLETE JOB. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL MATERIALS, LABOR AND EXPERTISE NECESSARY TO ACHIEVE A COMPLETE JOB AS INTENDED IN THESE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, FINAL DIMENSIONS AND PROCEDURES FOR THE WORK SHOWN ON THESE DRAWINGS AND SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENACT THE AFOREMENTIONED IN COMPLIANCE WITH GENERALLY ACCEPTED STANDARDS OF PRACTICE FOR THE CONSTRUCTION INDUSTRY FOR THE TYPE OF WORK SHOWN ON THESE DRAWINGS AND SPECIFICATIONS. THE OWNER RESERVES THE RIGHT OF REVIEW FOR ALL MATERIALS AND PRODUCTS FOR WHICH NO SPECIFIC BRAND NAME OR MANUFACTURER IS IDENTIFIED IN THESE DRAWINGS AND SPECIFICATIONS. (7?) THE CONTRACTOR SHALL VERIFY WITH THE OWNER THE NEED FOR SHOP DRAWINGS OR SAMPLES OF MATERIALS OR PRODUCTS, WHICH WERE NOT IDENTIFIED IN THESE DRAWINGS OR SPECIFICATIONS, AS WELL AS ANY MATERIAL, PRODUCT OR EQUIPMENT SUBSTITUTIONS PROPOSED IN PLACE OF THOSE ITEMS IDENTIFIED IN THESE DRAWINGS AND SPECIFICATIONS.

7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL UTILITY CONNECTIONS, UTILITY COMPANIES' REQUIREMENTS AND INCLUDE ANY RELATED COSTS ASSOCIATED WITH THIS RESPONSIBILITY IN THE PROPOSAL OR BID. THE CONTRACTOR IS ALSO RESPONSIBLE FOR WRITING LETTERS OF CONFORMATION REGARDING OPERATIVE AGREEMENTS FOR THIS PROJECT BETWEEN THE CONTRACTOR AND THE LOCAL FIRE DEPARTMENT; THE LOCAL WATER AGENCY; THE LOCAL NATURAL OR PROPANE GAS PROVIDER; THE LOCAL ELECTRICITY PROVIDER; THE LOCAL TELEPHONE SERVICE PROVIDERS; THE LOCAL CABLE TV PROVIDER; THE OWNER'S SECURITY SERVICE PROVIDER AND ANY UNNAMED UTILITY TYPE SERVICE PROVIDER. THE CONTRACTOR SHALL PROVIDE COPIES OF ANY SUCH AGREEMENTS TO THE OWNER, IF REQUIRED OR REQUESTED.

8. THE CONTRACTOR IS FULLY RESPONSIBLE TO ENACT THE APPROPRIATE SAFETY PRECAUTIONS REQUIRED TO MAINTAIN A SAFE WORKING ENVIRONMENT. THE CONTRACTOR SHALL ALSO INDEMNIFY AND HOLD HARMLESS THE OWNER, THEIR CONSULTANTS AND EMPLOYEES FROM ANY PROBLEMS, WHICH RESULT FROM THE CONTRACTOR'S PERFORMANCE OF THE WORK RELATED TO THE SAFETY OF THE CONSTRUCTION SITE.

9. THE CONTRACTOR SHALL CARRY THE APPROPRIATE WORKMAN'S COMPENSATION AND LIABILITY INSURANCE, AS REQUIRED BY THE LOCAL GOVERNMENT AGENCY HAVING JURISDICTION FOR THIS ISSUE, AS WELL AS COMPLY WITH THE GENERALLY ACCEPTED INDUSTRY STANDARDS OF PRACTICE FOR A PROJECT OF THIS SCOPE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WITH THE OWNER, IF HE WILL BE REQUIRED TO CARRY FIRE INSURANCE OR OTHER TYPES OF INSURANCE, AS WELL AS, MAKING THE OWNER ADDITIONALLY INSURED ON THEIR POLICIES FOR THE DURATION OF THE PROJECT. HE SHOULD ALSO ASSIST THE OWNER IN IDENTIFYING THE AMOUNT OF COVERAGE REQUIRED FOR THEIR CO-INSURANCE NEEDS.

10. THE CONTRACTOR SHALL MAINTAIN A CLEAN AND ORDERLY JOB SITE ON A DAILY BASIS. THE CONTRACTOR SHALL NOT UNREASONABLY ENCUMBER THE SITE WITH MATERIALS OR EQUIPMENT. THE CONTRACTOR SHALL NOT ENDANGER EXISTING STRUCTURES AND ANY NEWLY CONSTRUCTED STRUCTURE BY OVERLOADING THE AFOREMENTIONED WITH MATERIALS OR EQUIPMENT. THE CONTRACTOR SHALL PROTECT ALL EXISTING CONSTRUCTION TO REMAIN AND NEW CONSTRUCTION AFTER IT IS INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE TEMPORARY ENCLOSURES OR PROTECTION, AS NEEDED, TO PROTECT THE EXISTING STRUCTURE AND ANY NEWLY CONSTRUCTED STRUCTURES FROM THE ILL EFFECTS OF WEATHER FOR THE DURATION OF THE ENTIRE CONSTRUCTION PROCESS.

11. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGE INCURRED BY HIM OR HIS SUBCONTRACTORS TO ANY EXISTING STRUCTURE OR WORK, ANY STRUCTURE OR WORK IN PROGRESS; UNUSED MATERIAL INTENDED FOR USE IN THE PROJECT; OR ANY EXISTING SITE CONDITION WITHIN THE SCOPE OF WORK INTENDED BY THESE DRAWINGS AND SPECIFICATIONS. THIS RESPONSIBILITY WILL INCLUDE ANY MATERIALS AND LABOR REQUIRED TO CORRECT SUCH DAMAGE TO THE OWNER'S SATISFACTION AT NO COST TO THE OWNER UNLESS AGREED TO BY THE OWNER IN WRITING.

12. THE CONTRACTOR SHALL WARRANTY ACCORDING TO STATE CONSTRUCTION LAW ALL WORK DONE BY HIM, HIS EMPLOYEES AND HIS SUBCONTRACTORS AGAINST ALL VISIBLE DEFECTS OR ERRORS THAT BECOME APPARENT WITHIN THE FIRST YEAR AFTER THE COMPLETION OF THE PROJECT, AS ACCEPTED BY THE OWNER. THE CONTRACTOR SHALL, ADDITIONALLY, WARRANTY ALL DEFECTS AND ERRORS NOT VISIBLE, BUT CONTAINED WITHIN CONSTRUCTED WORK, FOR A PERIOD OF TEN YEARS FROM THE COMPLETION OF THE PROJECT, ALSO ACCORDING TO STATE CONSTRUCTION LAW. ANY AND ALL DEFECTS AND ERRORS THAT DO BECOME APPARENT SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR TO THE OWNER'S SATISFACTION AT NO COST TO THE OWNER FOR MATERIALS OR LABOR. ALTERATIONS OR CHANGES TO THIS WARRANTY MUST BE MUTUALLY AGREED TO IN WRITING BY BOTH THE CONTRACTOR AND THE OWNER.

13. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE APPROPRIATENESS OF THE APPLICATION OF ALL THE PRODUCT SELECTIONS SHOWN OR INTENDED IN THESE DRAWINGS AND SPECIFICATIONS. THE INTENDED MEANING OF "APPROPRIATENESS" IS THE PROPER SYSTEM, MODEL AND SPECIFIC SELECTION REQUIRED FOR THE INTENDED USE AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE MOST CURRENT MODEL NAME OR NUMBER FROM THE SELECTED MANUFACTURER. THE CONTRACTOR IS RESPONSIBLE TO VERIFY THAT ANY INSTALLERS, WHICH HE SELECTS FOR THE VARIOUS PRODUCTS WILL FOLLOW ALL THAT PRODUCT MANUFACTURER'S REQUIRED AND RECOMMENDED METHODS AND PROCEDURES TO ACHIEVE THE DESIRED RESULTS CLAIMED BY SUCH MANUFACTURERS FOR THEIR PRODUCTS. IN ADDITION, THESE DRAWINGS AND SPECIFICATIONS IDENTIFY SOME REQUIRED SYSTEMS AND PRODUCTS IN GENERIC TERMS. THE CONTRACTOR IS RESPONSIBLE TO MAKE SPECIFIC SELECTIONS FOR THESE SYSTEMS AND PRODUCTS THAT SATISFY THE SAME CONDITIONS OUTLINED ABOUT THE IDENTIFIED MANUFACTURED ITEMS.

14. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO IDENTIFY THE SCOPE OF WORK FOR A DESIGN AND BUILD TYPE OF MECHANICAL AND PLUMBING INSTALLATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE: THE NECESSARY LABOR FAMILIAR WITH THIS TYPE OF INSTALLATION; ALL NECESSARY MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, TEMPORARY CONSTRUCTION; AND ANY SPECIAL OR OCCASIONAL SERVICES REQUIRED TO INSTALL COMPLETE WORKING MECHANICAL AND PLUMBING SYSTEMS, AS DIAGRAMMATICALLY DESCRIBED AND SHOWN IN THESE DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE TO VERIFY ANY INFORMATION THAT IS NOT INDICATED IN THESE DRAWINGS AND SPECIFICATIONS BUT IS REQUIRED FOR THE PERFORMANCE OF THE INSTALLATION.

15. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO IDENTIFY THE SCOPE OF WORK FOR A DESIGN AND BUILD TYPE OF FIRE SPRINKLER INSTALLATION THROUGHOUT THE ENTIRE STRUCTURE. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE: THE NECESSARY LABOR FAMILIAR WITH THIS TYPE OF INSTALLATION; ALL NECESSARY MATERIALS, TOOLS, EQUIPMENT, TRANSPORTATION, TEMPORARY CONSTRUCTION; AND ANY SPECIAL OR OCCASIONAL SERVICES, INCLUDING THE PROCUREMENT OF ALL PERMITS REQUIRED TO INSTALL A COMPLETE WORKING SYSTEM. THE CONTRACTOR WILL ALSO BE RESPONSIBLE TO VERIFY ANY INFORMATION THAT IS NOT INDICATED IN THESE DRAWINGS AND SPECIFICATIONS BUT IS REQUIRED FOR THE PERFORMANCE OF THE INSTALLATION.

16. IF THE CONTRACTOR FINDS FAULT WITH, DISAGREES WITH, OBJECTS TO, OR WOULD LIKE TO CHANGE THE SCOPE OF THESE GENERAL NOTES OR HIS STATED RESPONSIBILITIES, AS OUTLINED IN THESE GENERAL NOTES, THEN THE CONTRACTOR MUST RESOLVE SUCH CHANGES WITH THE OWNER IN WRITING BEFORE SIGNING A CONTRACT. FAILURE TO DO SO SHALL CONSTITUTE AN UNDERSTANDING OF THESE GENERAL NOTES AND THEIR ACCEPTANCE BY THE CONTRACTOR.

17. THE CONTRACTOR SHALL IDENTIFY IN HIS PROPOSAL OR BID, WHICH PERMITS HE EXPECTS TO OBTAIN AND WHICH PERMITS AND APPLICATION FEES HE EXPECTS THE OWNER TO PROVIDE.

18. THE CONTRACTOR IS RESPONSIBLE TO IDENTIFY ANY CONFLICTS BETWEEN HIS CONTRACT WITH THE OWNER AND THESE DRAWINGS. THE ARCHITECTURAL DESIGNER, THE CONTRACTOR AND THE OWNER SHALL REVIEW THESE CONFLICTS IN ORDER TO AMEND ONE OF THESE DOCUMENTS BEFORE THE START OF THE CONSTRUCTION. IF A CONFLICT IS DISCOVERED WITHOUT THIS PRIOR RESOLUTION, THEN THESE DRAWINGS SHALL TAKE PRECEDENCE OVER ANY OTHER DOCUMENTS IN RESOLVING A CONFLICT.

19. THE CONTRACTOR SHALL ASSUME THAT SITE MEETINGS WITH THE OWNER, THE ARCHITECTURAL DESIGNER AND THE CONTRACTOR PRESENT SHALL BE HELD ONCE EVERY WEEK, UNLESS THEY ARE MUTUALLY CHANGED OR CANCELED. THE CONTRACTOR SHALL KEEP WRITTEN NOTES OF ALL RELEVANT INFORMATION DISCUSSED AT THESE MEETINGS AND PROVIDE COPIES TO THE OWNER AND THE ARCHITECTURAL DESIGNER, UNLESS DIFFERING ARRANGEMENTS ARE RESOLVED WITH THE ARCHITECTURAL DESIGNER AND THE OWNER. THE ARCHITECTURAL DESIGNER SHALL PROVIDE ANY REQUESTED SKETCHES OR ANY REQUESTED INFORMATION THAT IS REQUIRED AND REQUESTED DURING THESE MEETINGS. THE OWNER AND THE CONTRACTOR SHALL ALSO PROVIDE ANY REQUESTED INFORMATION THAT IS REQUIRED DURING THESE MEETINGS.

20. THE ARCHITECTURAL DESIGNER OR THE OWNER CAN WRITE AND ISSUE FIELD ORDERS FOR CHANGES TO THE DRAWINGS AND SPECIFICATIONS, AS REQUESTED BY OWNER OR THE CONTRACTOR. IF ADDITIONAL (OR DELETION OF) COST TO THE PROJECT IS REQUIRED, THEN THESE FIELD ORDERS SHALL BECOME THE BASIS OF A CHANGE ORDER.

21. THE CONTRACTOR SHALL WRITE AND ISSUE ALL CHANGE ORDERS, WHICH SHALL INCLUDE A COST BREAKDOWN FOR ALL THE WORK DESCRIBED IN SUCH A CHANGE ORDER. ANY CHANGE ORDER WILL NOT BE BINDING TO THE OWNER UNTIL BOTH THE CONTRACTOR AND THE OWNER HAVE SIGNED IT.

22. UPON SUBSTANTIAL COMPLETION THE CONTRACTOR SHALL NOTIFY THE ARCHITECTURAL DESIGNER, WHO SHALL COORDINATE A WALK-THROUGH OF THE PROJECT WITH THE OWNER AND THE CONTRACTOR AND THEN PROVIDE A PUNCH LIST OF ITEMS TO COMPLETE. ARRANGEMENTS FOR FINAL PAYMENT WILL BE MADE AT THAT TIME.

ARCHITECTURAL PLAN SYMBOLS

- MATCHLINE
- 1 / 4 A8.1 2 / 3 — INTERIOR ELEVATION KEY. INDICATED NUMBERS USED FOR VIEW IDENTIFICATION
- 4 A5.1 — EXTERIOR ELEVATION KEY. NUMBERS USED FOR VIEW IDENTIFICATION
- 1 — REVISION TAG
- AA — WINDOW TAG
- C1 — WALL/FLOOR/CEILING TYPE
- SPOT ELEVATION
- A — DEMOLITION KEYNOTE
- A — DRAWING KEYNOTE
- 101A — DOOR TAG; SEE DOOR SCHEDULE
- A — FINISH TAG; SEE FINISH SCHEDULE
- ROOM NAME 101 — ROOM TAG
- N — NORTH ARROW
- ALIGN SURFACES
- SIM 1 A6.1 — SIM 1 A6.1 — FULL BUILDING SECTION KEY
- SIM 1 A6.1 — WALL AND PARTIAL SECTION KEY
- A / 1 — COLUMN GRID TAGS
- SIM 1 A4.1 — ENLARGED PLAN OR DETAIL CALLOUT

GENERAL DEMOLITION NOTES

1. THE DEMOLITION WORK SHOWN ON THESE DRAWINGS MAY NOT BE THE COMPLETE DEMOLITION REQUIRED TO ACCOMMODATE THE NEW WORK, WHICH IS SHOWN ELSEWHERE. THE INTENT OF THESE DRAWINGS IS TO GENERALLY SHOW THE DEMOLITION SCOPE OF WORK EXPECTED OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE TO COORDINATE ANY ADDITIONAL DEMOLITION WORK AND VERIFY THE EXTENT OF DEMOLITION REQUIRED IN ORDER TO ACCOMMODATE ANY NEW WORK.

2. ALL THE DIMENSIONS SHOWN, OR NOT SHOWN BUT REQUIRED, MUST BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE INFORMATION SHOWN ON THESE DRAWINGS WAS DERIVED BY THE ARCHITECTURAL DESIGNER WITHOUT ANY SURVEYING OR ENGINEERING EQUIPMENT AND IS INTENDED TO BE HELPFUL, BUT NOT NECESSARILY ACCURATE.

3. ALL BIDS OR PROPOSALS MUST CLEARLY IDENTIFY WHAT WORK WILL BE PERFORMED AND WHAT WORK WILL NOT BE PERFORMED. THE CONTRACTOR WILL ALSO IDENTIFY ANY ALLOWANCES FOR WORK TOO UNCERTAIN TO BID FROM THE INFORMATION SHOWN ON THESE DRAWINGS.

4. THE CONTRACTOR WILL COORDINATE THE CAPPING AND PATCHING OF ALL EXISTING PLUMBING FIXTURES, SPRINKLER SYSTEMS AND RELATED EQUIPMENT SHOWN TO BE REMOVED WITH THE EXISTING ROUGH-IN SYSTEM TO REMAIN. THE CONTRACTOR WILL VERIFY THE WORK REQUIRED FOR INSTALLING AND CONNECTING NEW PLUMBING FIXTURES AND RELATED EQUIPMENT, AS SHOWN ON THE NEW WORK PLANS, TO THE REMAINING EXISTING SYSTEM. THE CONTRACTOR WILL REVIEW WITH THE ARCHITECTURAL DESIGNER IN THE FIELD ANY CONDITIONS THAT WILL CONFLICT WITH THIS INTENT.

5. THE CONTRACTOR WILL COORDINATE THE CAPPING AND PATCHING OF THE MECHANICAL SYSTEM AND RELATED DEVICES SHOWN TO BE REMOVED WITH THE EXISTING SYSTEM TO REMAIN. THE CONTRACTOR WILL VERIFY THE WORK REQUIRED FOR INSTALLING ANY NEW MECHANICAL SYSTEM AND RELATED EQUIPMENT, AS SHOWN ON THE NEW WORK PLANS, TO THE REMAINING EXISTING SYSTEM OR EQUIPMENT. THE CONTRACTOR WILL REVIEW WITH THE ARCHITECTURAL DESIGNER IN THE FIELD ANY CONDITIONS THAT WILL CONFLICT WITH THIS INTENT.

6. THE CONTRACTOR WILL COORDINATE THE CAPPING AND PATCHING OF ALL EXISTING ELECTRICAL FIXTURES AND RELATED EQUIPMENT SHOWN TO BE REMOVED WITH THE EXISTING SYSTEM TO REMAIN. THE CONTRACTOR WILL VERIFY THE WORK REQUIRED FOR INSTALLING AND CONNECTING NEW ELECTRICAL FIXTURES AND RELATED EQUIPMENT, AS SHOWN ON THE NEW WORK PLANS, TO THE REMAINING EXISTING SYSTEM. THE CONTRACTOR WILL REVIEW WITH THE ARCHITECTURAL DESIGNER IN THE FIELD ANY CONDITIONS THAT WILL CONFLICT WITH THIS INTENT.

7. THE CONTRACTOR WILL PROTECT EXISTING MATERIALS TO REMAIN, AS REQUIRED. DAMAGE TO EXISTING MATERIALS TO REMAIN, BECAUSE OF INADEQUATE PROTECTION SHALL BE FIXED, REPAIRED OR REPLACED, AS REQUIRED BY THE ARCHITECTURAL DESIGNER, AT THE SOLE EXPENSE OF THE CONTRACTOR INCLUDING BUT NOT NECESSARILY LIMITED TO LABOR AND MATERIALS.

8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING ANY ADDITIONAL PERMITS, ENGINEERING, SHORING AND ANY CONSTRUCTION DOCUMENTS BY OTHERS RELATED TO THIS WORK, WHETHER OR NOT THEY ARE REQUIRED, FROM THE LOCAL AUTHORITIES.

9. THE CONTRACTOR IS RESPONSIBLE TO PROPERLY STORE AND PROTECT ANY MATERIAL DESIGNATED ON THE DRAWINGS TO BE SALVAGED AND RE-INSTALLED AS PART OF THE NEW WORK INTENT.

CONSTRUCTION GENERAL NOTES

1. THE CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN THE SECURITY OF THE JOB SITE DURING THE CONSTRUCTION PROCESS UNTIL FINAL ACCEPTANCE BY THE OWNER OR UNTIL AN ALTERNATE DATE, AS MUTUALLY AGREED BETWEEN THE OWNER AND THE CONTRACTOR.

2. THE CONTRACTOR WILL VERIFY THE ROUGH-IN DIMENSIONS AND REQUIREMENTS FROM THE APPROPRIATE MANUFACTURER OR FABRICATOR FOR DOORS, WINDOWS, EQUIPMENT, CABINETRY, PLUMBING FIXTURES, ELECTRICAL FIXTURES, APPLIANCES AND ANY OTHER DEVICES BEFORE PROCEEDING TO LAY OUT AREAS WHERE SUCH ITEMS ARE LOCATED.

3. ALL CONNECTIONS AND FASTENERS ARE INTENDED TO BE CONCEALED, UNLESS OTHERWISE NOTED. WHERE SUCH DEVICES CAN NOT BE CONCEALED AS INTENDED NOTIFY THE ARCHITECTURAL DESIGNER FOR REVIEW OF DESIGN CONFORMANCE.

4. FIREBLOCKING SHALL BE PROVIDED IN ALL LOCATIONS IDENTIFIED BY LOCAL / STATE BUILDING CODE AND IN ANY ADDITIONAL LOCATIONS IDENTIFIED BY THE LOCAL AUTHORITIES OR LOCAL ORDINANCES

5. THE CONTRACTOR WILL VERIFY ALL ROOF AND FRAMING SPACES REQUIRED TO BE VENTILATED WITH THE LOCAL FIELD INSPECTOR OR LOCAL CODE AND PROVIDE THE APPROPRIATE NET FREE VENTILATION AREA, BUT IN NO CASE SHALL IT BE LESS THAN 1/50TH OF THE AREA OF THE SPACE TO BE VENTILATED. WHEN THE MEANS OF THE VENTILATION IS VISIBLE FROM A COMMONLY USED SPACE, PASSAGEWAY, YARD OR PUBLIC RIGHT OF WAY, THE CONTRACTOR SHALL REVIEW THIS SITUATION WITH THE ARCHITECTURAL DESIGNER FOR DESIGN CONFORMANCE BEFORE INSTALLING SUCH DEVICES, EQUIPMENT OR MATERIALS.

6. THE CONTRACTOR WILL VERIFY AND PROVIDE THE REQUIRED BLOCKING AND BACKING FOR ALL CABINETRY, WALL-MOUNTED ACCESSORIES, BUILT-IN EQUIPMENT, LIGHT FIXTURES OR OTHER DEVICES REQUIRING BLOCKING OR BACKING.

7. THE CONTRACTOR WILL VERIFY AND PROVIDE ALL CODE REQUIRED FIREPROOFING AT ALL PENETRATIONS INTO AND THROUGH A FIRE RATED FLOOR, WALL, CEILING OR ROOF ASSEMBLY.

8. ALL CHANGES OR OFFSETS IN FLOOR FINISH MATERIAL WILL OCCUR UNDER A THRESHOLD, WHEN PROVIDED, OR AT THE CENTERLINE OF A DOOR TRANSITION UNLESS OTHERWISE INDICATED ON THE DRAWINGS. OTHER LOCATIONS OF THESE CONDITIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL DESIGNER IN THE FIELD FOR DESIGN CONFORMANCE BEFORE INSTALLING ANY MATERIAL.

9. THE SEALANT, CAULKING AND FLASHING LOCATIONS SHOWN ON THESE DRAWINGS ARE NOT INTENDED TO COVER ALL CONDITIONS REQUIRING THESE PRODUCTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY ALL CONDITIONS REQUIRING THESE PRODUCTS, SIMILAR PRODUCTS AND REVIEW THESE CONDITIONS NOT IDENTIFIED IN THE DRAWINGS WITH THE ARCHITECTURAL DESIGNER FOR DESIGN CONFORMANCE.

10. COMPLETE ALL WORK REQUIRED TO MEET LOCAL / STATE ENERGY CONSERVATION REQUIREMENTS INCLUDING BUT NOT LIMITED TO ALL MANDATORY AND SPECIAL FEATURES, AS WELL AS ANY LOCAL ORDINANCES AND ANY NEW REQUIREMENTS IDENTIFIED BY THE LOCAL BUILDING FIELD INSPECTOR.

11.

12. THE CONTRACTOR SHALL IDENTIFY IN HIS PROPOSAL WHICH UTILITY TYPE (WATER, ELECTRICITY, TELEPHONE, INTERNET, ETC.) CONNECTIONS, USE AND RELATED COSTS WILL BE INCLUDED IN HIS OVERHEAD AND WHICH COSTS HE EXPECTS THE OWNER TO PROVIDE. ANY UTILITY TYPE COST WHICH IS NOT IDENTIFIED, AS AN OWNER PROVIDED ITEM, WILL BE ASSUMED TO BE INCLUDED IN THE CONTRACTOR'S OVERHEAD COST.

13. THE CONTRACTOR SHALL IDENTIFY AND PROVIDE THE REQUIRED SIDEWALK AND PUBLIC PASSAGE ENCLOSURE PROTECTION AT ANY AFFECTED RIGHT-OF-WAY AREAS OR PUBLIC ACCESS LOCATIONS. THE CONTRACTOR WILL REVIEW ALL INTENDED SIGNAGE WITH THE ARCHITECTURAL DESIGNER FOR DESIGN CONFORMANCE.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION AND ANY DIRECTION FROM THE OWNER OR THE ARCHITECTURAL DESIGNER SHALL NOT BE CONSTRUED TO OVERRIDE THIS RESPONSIBILITY UNLESS MUTUALLY AGREED TO IN A WRITTEN DOCUMENT IDENTIFYING A SPECIFIC AREA OF WORK FOR WHICH THE CONTRACTOR WILL NOT BE RESPONSIBLE

CODE REFERENCES

RISBC-1 RHODE ISLAND BUILDING CODE (510-RICR-00-00-1) INCORPORATES THE INTERNATIONAL BUILDING CODE, 2018 EDITION, BY REFERENCE.

RI FIRE CODE (450-RICR-00-00-7) INCORPORATES THE FIRE CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, INC., (NFPA 1), 2018 EDITION, BY REFERENCE.

RI LIFE SAFETY CODE (450-RICR-00-00-8) INCORPORATES THE LIFE SAFETY CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION, INC., (NFPA 101), 2018 EDITION, BY REFERENCE.

RISBC-3 RHODE ISLAND PLUMBING CODE (510-RICR-00-00-3) INCORPORATES THE INTERNATIONAL PLUMBING CODE, 2018 EDITION, BY REFERENCE.

RISBC-4 RHODE ISLAND MECHANICAL CODE (510-RICR-00-00-4) INCORPORATES THE INTERNATIONAL MECHANICAL CODE, 2018 EDITION, BY REFERENCE.

RISBC-5 RHODE ISLAND ELECTRICAL CODE (510-RICR-00-00-5) INCORPORATES THE NATIONAL ELECTRICAL CODE, 2020 EDITION, BY REFERENCE.

ACCESSIBILITY & USABLE BUILDING & FACILITIES ICC A117.11-2009

ARCHITECTURAL GENERAL NOTES

1. ALL THE DIMENSIONS OF EXISTING CONDITIONS SHOWN, OR NOT SHOWN BUT REQUIRED, MUST BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. LABELED DIMENSIONS CONTROL THE DESIGN INTENT, DO NOT SCALE DRAWINGS. DIMENSIONS FOR PROPOSED WORK ARE NOT ADJUSTABLE WITHOUT APPROVAL FROM THE ARCHITECT.

2. PROVIDE ALL TEMPORARY FRAMING AND SHORING REQ'D TO SUPPORT EXISTING STRUCTURE DURING DEMOLITION AND ALTERATION OF ANY LOAD BEARING BUILDING COMPONENTS.

3. PROVIDE TEMPORARY, SECURE / WEATHER-PROOF ENCLOSURE @ ALL NEW AND ALTERED OPENINGS TO EXTERIOR DURING DEMOLITION AND CONSTRUCTION.

4. PROVIDE TEMPORARY DUST-PROOF BARRIERS BETWEEN AREA OF WORK AND EXISTING INTERIOR SPACES TO REMAIN.

5. PRIOR TO BEGINNING DEMOLITION, IDENTIFY WITH OWNER ANY APPLIANCES, CABINETS, FIXTURES OR OTHER ITEMS TO BE SELECTIVELY REMOVED AND STORED ONSITE FOR FUTURE REUSE.

6. DEMOLISH FIXTURES AND EQUIPMENT AS SHOWN, REMOVE ALL ASSOCIATED PLUMBING & WIRING NOT TO BE REUSED IN NEW WORK.

7. OWNER TO DETERMINE IN FIELD WITH CONTRACTOR EXTENT TO WHICH EXISTING FLOORING DISTURBED BY CONSTRUCTION WILL BE REMOVED AND REPLACED. CONTRACTOR SHALL SUGGEST APPROPRIATE STEPS TO ADEQUATELY REFINISH FLOORING AS NEEDED.

8. IN NO CASE SHALL DIMENSIONS BE SCALED FROM DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD BEFORE PROCEEDING WITH SUBSEQUENT WORK.

9. ALL DIMENSIONS ARE TO CENTER LINE ( ) OF NEW WALLS AND FACE OF FINISH TO EXISTING WALLS UNLESS OTHERWISE NOTED.

10. DIMENSIONS MARKED "MIN." INDICATE A MINIMUM CLEARANCE THAT MUST BE MAINTAINED.

11. REFER TO SHEET A0.0 FOR SYMBOLS AND ABBREVIATIONS. REFER TO SHEETS A0.1, ET. AL. FOR GENERAL NOTES AND SPECIFICATIONS

12. ALL FINISH WALL SURFACES TO BE FLUSH UNLESS NOTED OTHERWISE. PROVIDE FURRING AS REQUIRED.

13. ALL GYP. BD. WALLS TO BE TAPED, SANDED AND PRIMED TO LEVEL 5 FINISH ("IMPERIAL" PLASTER SKIMCOAT, PRIMED AND PAINTED) UNLESS NOTED OTHERWISE.

14. ALL WORK SHALL COMPLY WITH CURRENTLY ADOPTED STATE BUILDING CODE AND ASSOCIATED CODES ADOPTED VIA INCORPORATION.

15. IF THE ARCHITECT HAS NOT BEEN RETAINED FOR CONSTRUCTION ADMINISTRATION, THEN THE ARCHITECT IS NOT RESPONSIBLE FOR SEEING THAT THE CONTRACTOR ADHERES TO THE CONSTRUCTION DRAWINGS.

MECHANICAL GENERAL NOTES

1. IT IS THE INTENTION OF THE DESIGNER, THAT ALL MECHANICAL DUCTS, WIRING, EQUIPMENT AND OTHER MECHANICAL WORK WILL BE CONCEALED WITHIN THE WALL, FLOOR, CEILING OR ROOF STRUCTURE OF THE BUILDING, EXCEPT IN AREAS WITH OPEN CEILINGS OR IN UTILITY ROOMS. THE CONTRACTOR WILL REVIEW WITH THE DESIGNER ANY CONFLICTS WITH THIS INTENTION BEFORE FRAMING IS ENCLOSED OR ANY DEVICE IS INSTALLED.

2. ALL EXTERIOR AND INTERIOR GRILLES AND LOUVERS SHALL BE CENTERED OR ALIGNED WITH SIGNIFICANT ARCHITECTURAL DESIGNER OBJECTS SUCH AS DOORS, WINDOWS OR OTHER ADJACENT ELEMENTS. THE CONTRACTOR WILL REVIEW WITH THE DESIGNER ANY CONFLICTS WITH THIS INTENTION DURING THE REVIEW OF THE SYSTEM LAYOUT SUBMITTAL (SEE DESIGN/BUILD REQUIREMENTS).

3. THE CONTRACTOR WILL VERIFY THE DUCT ROUTE AND TERMINATION DEVICES AT THE EXTERIOR FOR ALL EXHAUST FANS, RANGE EXHAUST OR OTHER SIMILAR MECHANICAL-TYPE SYSTEMS WITH THE DESIGNER FOR DESIGN CONFORMANCE DURING THE SYSTEM LAYOUT SUBMITTAL REVIEW. UNLESS OTHERWISE APPROVED BY THE DESIGNER, THE INTENT FOR ALL TERMINATIONS TO THESE SYSTEMS IS TO OCCUR AT ROOF SURFACES, WHICH CAN NOT BE SEEN FROM THE STREET OR WITHIN A VERTICAL ROOFTOP SURFACES, SUCH AS A PARAPET WALL OR EXTERIOR WALL CONDITION, WHICH CAN NOT BE SEEN FROM THE GROUND.

4. THE CONTRACTOR WILL REVIEW ALL MECHANICAL-RELATED REQUIREMENTS OF RHODE ISLAND REGULATIONS / BUILDING CODE AND COMPLY WITH THE PROVISIONS SPECIFIED. IF ANY CONFLICTS RESULT WITH THE DESIGN INTENT, THE CONTRACTOR WILL REVIEW SUCH SITUATIONS WITH THE DESIGNER FOR DESIGN CONFORMANCE BEFORE INSTALLING.

5. THE CONTRACTOR WILL VERIFY AND IDENTIFY ANY REQUIRED BLOCKING IN THE FRAMING NECESSARY FOR MECHANICAL DEVICE SUPPORT OR ENCLOSURE.

6. THE CONTRACTOR WILL PROVIDE VENTILATION DUCTS AS NECESSARY FOR THE APPLIANCES SHOWN (RANGE HOOD, CLOTHES DRYER, ETC.) AS REQUIRED BY STATE / LOCAL BUILDING CODE.

PLUMBING GENERAL NOTES

1. THE CONTRACTOR WILL VERIFY AND IDENTIFY ALL REQUIRED BLOCKING IN THE FRAMING NECESSARY FOR PLUMBING FIXTURE SUPPORT OR ENCLOSURE.

2. THE CONTRACTOR WILL VERIFY THE ROUTE AND TERMINATION AT THE ROOF FOR ALL VENT STACKS. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, IT IS THE INTENTION OF THE DESIGNER, THAT ALL SUCH TERMINATIONS OCCUR AT LOCATIONS NOT VISIBLE FROM THE STREET.

3. THE CONTRACTOR WILL REVIEW ALL PLUMBING RELATED REQUIREMENTS OF THE LOCAL BUILDING AND ENERGY CODES AND VERIFY THAT ALL NEW WORK WILL COMPLY WITH ALL THE PROVISIONS REQUIRED OF THIS PROJECT. IF ANY CONFLICTS EXIST WITH THE DESIGN INTENT, THE CONTRACTOR WILL REVIEW SUCH SITUATIONS WITH THE DESIGNER FOR DESIGN CONFORMANCE BEFORE INSTALLING.

4. IN ALL EXPOSED CEILING AREAS, THE CONTRACTOR SHALL REVIEW WITH THE DESIGNER ANY POTENTIAL VISIBLE PLUMBING LINES, DRAINS, FIXTURE SUPPORTS, CUTOUTS OR ANY OTHER PLUMBING RELATED WORK FOR DESIGN CONFORMANCE. THIS REVIEW WILL OCCUR IN THE FIELD PRIOR TO COMMENCING ANY WORK THAT WOULD AFFECT THE VISUAL QUALITY OF THE EXPOSED CEILING AREA.

5. THE CONTRACTOR WILL VERIFY THE FOLLOWING FOR ALL HOT WATER HEATERS IN THIS PROJECT:
   A. REQUIRED COMBUSTION AIR IS PROVIDED AS PER U.P.C. TABLE 13-1.
   B. REQUIRED ACCESS IS PROVIDED AS PER U.P.C SEC.1311.
   C. REQUIRED TEMPERATURE AND PRESSURE RELIEF IS PROVIDED AS PER U.P.C. SEC. 1007(E).
   D. REQUIRED SEISMIC BRACING IS PROVIDED AS PER U.P.C. SEC. 1310(E).
   E. REQUIRED INSULATION IS PROVIDED AS PER LOCAL ENERGY CODE.

6. THE CONTRACTOR WILL PROVIDE NON-REMOVABLE BACK FLOW PREVENTION DEVICES AT ALL NEW HOSE BIBS.

7. ALL DISHWASHERS WILL BE CONNECTED DIRECTLY TO THE DRAINAGE SYSTEM WITH AN APPROVED AIR GAP FITTING.

8. THE CONTRACTOR WILL PROVIDE ACCESS PANELS AS NECESSARY TO SERVICE CONCEALED PLUMBING EQUIPMENT.

9. THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING THE WARRANTY INFORMATION AND RESPONSIBILITY WITH THE OWNER FOR ALL EQUIPMENT. IF SPECIAL ARRANGEMENTS ARE NOT COORDINATED, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL FIXTURES AND EQUIPMENT HE INSTALLS FOR A PERIOD OF TWO YEARS. ANY REPAIRS REQUIRED AND PERFORMED BY THE CONTRACTOR OR HIS DESIGNATED SUBCONTRACTOR WILL BE AT NO COST TO THE OWNER, INCLUDING PARTS AND LABOR COSTS.

10. THE FIXTURES AND EQUIPMENT LISTED IS PROVIDED FOR THE CONTRACTOR'S BENEFIT TO COORDINATE THE INSTALLATION OF THE SAME. THE CONTRACTOR CAN PROPOSE SUBSTITUTES FOR ALL FIXTURES AND EQUIPMENT LISTED, IF HE CAN DEMONSTRATE AN EQUAL QUALITY ALTERNATIVE AND IT IS APPROVED BY THE OWNER.

ABBREVIATIONS

&	AND
L	ANGLE
@	AT
CL	CENTERLINE
Ø	DIAMETER
#	NUMBER
ACOUS	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
ADDEN	ADDENDUM
ADD'L	ADDITIONAL
ADJ	ADJUSTMENTS
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AHU	AIR HANDLER UNIT
AL	ALUMINUM
APPX	APPENDIX
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
AWT	ACOUSTICAL WALL TREATMENT
BITUM	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BM	BEAM
B.O.	BOTTOM OF
BOD	BOTTOM OF ROOF DECK
BOT	BOTTOM
BRD	BOARD
BYND	BEYOND
CAB	CABINET
CB	CATCH BASIN
CEM	CEMENT
CER	CERAMIC
CJ	CONTROL JOING
CLAD	CLADDING
CLG	CEILING
CLO	CLOSET
CLP	CLAP BOARD
CLR	CLEAR
CNTR	COUNTER
CO	CASED OPENING
COL	COLUMN
COMP	COMPRESSIBLE
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
CTSK	COUNTERSUNK
DBL	DOUBLE
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DET	DETAIL
DIA	DIAMETER
DIM	DIMENSION
DISP	DISPENSER
DN	DOWN
DO	DOOR OPENING
DR	DOOR
DWR	DRAWER
DS	DOWNSPOUT
DSP	DRY STANDPIPE
DWG	DRAWING
E	EAST
EA	EACH
EJ	EXPANSION JOIN
ELEC	ELECTRICAL
ELEV	ELEVATION
EMER	EMERGENCY
ENCL	ENCLOSURE
EP	ELECTRICAL PANELBOARD
EPS	EXTRUDED POLYSTYRENE
EQ	EQUAL
EQPT	EQUIPMENT
EVTR	ELEVATOR
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
ETR	EXISTING TO REMAIN
EXPO	EXPOSED
EXP	EXPANSION
EXT	EXTERIOR
FA	FIRE ALARM
FAP	FIRE ALARM PANEL
FBO/IBC	FURNISHED BY OWNER/ INSTALLED BY CONTRACTOR
FBO/IBO	FURNISHED BY OWNER/ INSTALLED BY OWNER
FC	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECT
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
FF	FINISH FLOOR
FIN	FINISH
FL	FLOOR
FLASH	FLASHING
FLUOR	FLUORESCENT
FM	FLOOR MAT
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOS	FACE OF STUD
FOW	FACE OF WALL
FP	FIRE PROTECTION
FRPF	FIREPROOF
FR	FIRE RATED
FRP	FIBERGLASS REINFORCED PLASTIC
FRT	FIRE RETARDANT TREATED
FS	FULL SIZE
FT	FOOT OF FEET
FTG	FOOTING
FURR	FURRING
FUT	FUTURE
GC	GENERAL CONTRACTOR
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GL	GLASS
GL BLK	GLASS BLOCK
GND	GROUND
GR	GRADE
GWB	GYPSUM WALL BOARD
GYP	GYPSUM

HDCP	HANDICAP
HB	HOSE BIB
HC	HOLLOW CORE
HDWD	HARDWOOD
HDWE	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HP	HIGH POINT
HR	HOUR
HGT	HEIGHT
ID	INSIDE DIMENSION
INSUL	INSULATION
INT	INTERIOR
INTERM	INTERMEDIATE
JA	JANITOR
JT	JOINT
KIT	KITCHEN
LAB	LABORATORY
LAM	LAMINATE
LAV	LAVATORY
LCC	LEAD COATED COPPER
LH	LEFT HAND
LKR	LOCKER
LP	LOW POINT
LT	LIGHT
MATL	MATERIAL
MAX	MAXIMUM
M.O.E.	MEANS OF EGRESS
MECH	MECHANICAL
MEMB	MEMBRANE
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MTL	METAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MR	MOISTURE RESISTANT
MTD	MOUNTED
MUL	MULLION
N	NORTH
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OPNG	OPENING
OVHD	OVERHEAD
PART	PARTITION
PC	PRECAST
PCT	PORCELAIN CERAMIC TILE
PERF	PERFORATED
PL	PLASTIC
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLUMB	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
POL	POLISHED
POLY	POLYETHYLENE
PR	PAIR
PS	PULL STATION
PT	PAINT
R	RISER
RAD	RADIUS
RB	RESILIENT BASE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFERENCE
REINF	REINFORCED
REM	REMOVE
REQ'D	REQUIRED
REQ'MTS	REQUIREMENTS
RESI	RESISTANT
REV	REVISION
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
S	SOUTH
SC	SOLID CORE
SCHED	SCHEDULE
SECT	SECTION
SF	SEAMLESS FLOORING
SH	SHELF
SHWR	SHOWER
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STAINED
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE
SUSP	SUSPENDED
SYM	SYMMETRICAL
SYS	SYSTEM
T&G	TONGUE AND GROOVE
TBD	TO BE DETERMINED
THK	THICK
TOC	TOP OF CURB
TOP	TOP OF PARAPET
TOS	TOP OF SLAB
TOW	TOP OF WALL
TYP	TYPICAL
UNF	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
VEN	VENEER
VB	VAPOR BARRIER
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
W	WEST
W/	WITH
WB	WOOD BASE
WC	WATER CLOSET
WD	WOOD
W/O	WITHOUT
WP	WATERPROOF
WT	WEIGHT
WWF	WELDED WIRE FABRIC

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HELLO@SIGNALWORKSARCHITECTURE.COM

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ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

BID SET

DATE: 01/17/2025

PROJECT NO: 2418

DRAWN BY: MM

CHECKED BY: BB

REVISIONS:

DRAWING TITLE:

GENERAL NOTES

DRAWING NO.:

A0.1

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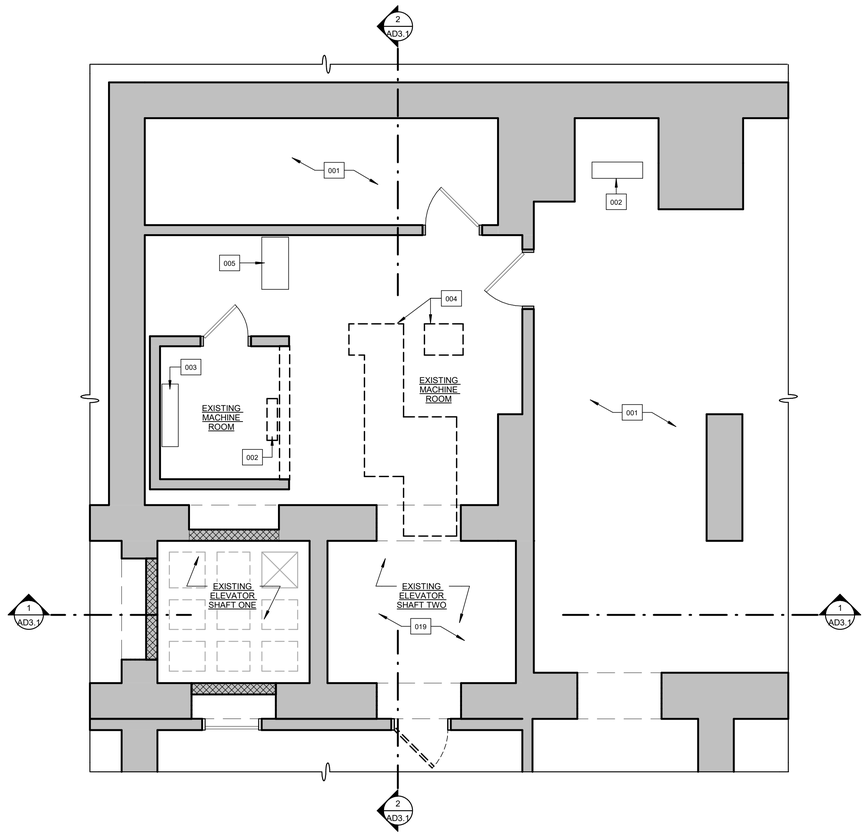
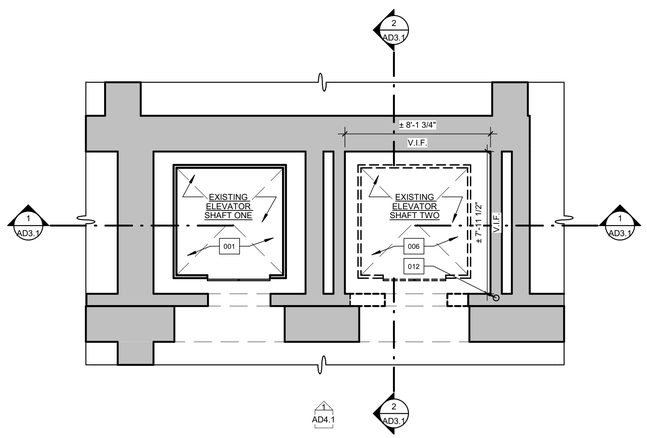
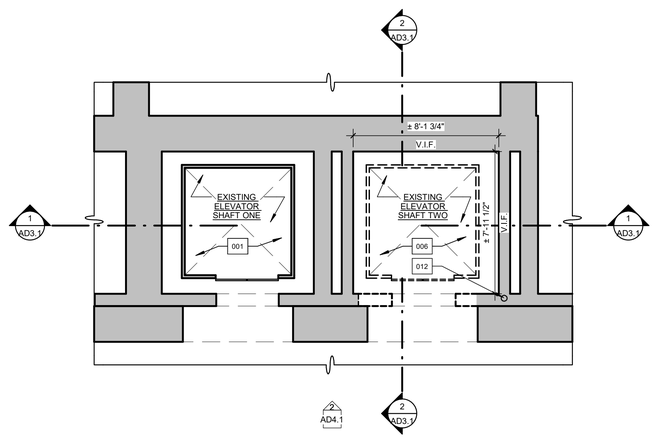


1 MACHINE ROOM DEMOLITION PLAN - BASEMENT
1/4" = 1'-0"



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



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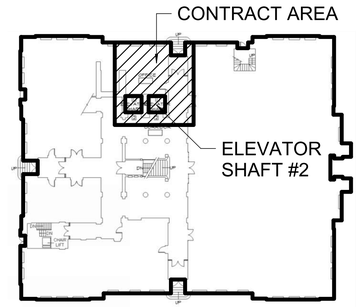
1/4" = 1'-0"



KEY PLAN
N.T.S.

KEYNOTES - DEMOLITION

001	AREA NOT IN SCOPE.
002	REMOVE AND DISPOSE EXISTING HVAC EQUIPMENT TO ACCOMODATE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
003	EXISTING ELEVATOR #1 CONTROL EQUIPMENT TO REMAIN.
004	REMOVE AND DISPOSE OF EXISTING ELEVATOR #2 EQUIPMENT IN ITS ENTIRETY TO RECEIVE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
005	EXISTING SERVER TO REMAIN.
006	REMOVE AND DISPOSE OF EXISTING ELEVATOR CABIN AND ELEVATOR COMPONENTS IN ITS ENTIRETY; REFER TO ELEVATOR MANUFACTURER DRAWINGS FOR ADDTL INFORMATION.
007	REMOVE AND DISPOSE OF EXISTING HOISTWAY EQUIPMENT IN ITS ENTIRETY; REFER TO STRUCTURAL DRAWINGS AND ELEVATOR MANUFACTURER DRAWINGS FOR ADDITIONAL INFORMATION.
008	EXISTING HOISTWAY BEAM TO REMAIN; REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
009	EXISTING SKYLIGHT TO REMAIN. AS BASE SCOPE. REFER TO KEYNOTE 017 & ADD-ALT #01
010	REMOVE AND DISPOSE OF EXISTING STEEL GRATE IN ITS ENTIRETY; REFER TO ELEVATOR MANUFACTURER'S DRAWINGS FOR ADDITIONAL INFORMATION.
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012	EXISTING PLUMBING PIPE TO REMAIN.
013	REMOVE AND SALVAGE EXISTING ELEVATOR INDICATOR TO BE REINSTALLED DURING NEW WORK.
014	REMOVE AND SALVAGE EXISTING TRIMWORK TO BE USED AS A TEMPLATE FOR NEW WORK. DISPOSE AFTERWARDS.
015	REMOVE AND DISPOSE OF EXISTING WALL BASE IN ITS ENTIRETY.
016	REMOVE AND SALVAGE EXISTING ELEVATOR INDICATOR. PATCH AND REPAIR AS NEEDED TO RECIEVE NEW WORK.
017	GC TO VERIFY THAT EXISTING VENT STACK HAS BEEN DECOMMISSIONED; NOTIFY OWNER ARCHITECT OF FINDINGS BEFORE PRECEDING WITH NEW WORK.
018	EXISTING INDICATOR/ELEVATOR COMPONENT TO REMAIN.
019	COORDINATE EXTENT OF ELEVATOR PIT WORK WITH MEP+FP & STRUCTURAL DRAWINGS.

GENERAL NOTES - DEMOLITION

1. ELEVATOR #1 TO REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION.
2. DEMOLITION TO OCCUR DURING STANDARD WORKING HOURS; GC TO COORDINATE WITH OWNER.
3. DEMOLITION PLANS SHALL BE USED IN CONJUNCTION WITH MEP & STRUCTURAL DEMOLITION DRAWINGS.
4. GC TO COORDINATE WITH OWNER AND ARCHITECT BEFORE REMOVING ANY ADDITIONAL ELEMENTS DISCOVERED DURING DEMOLITION; GC TO PROVIDE NECESSARY DOCUMENTATION.
5. THE INTENT IS TO UTILIZE THE EXISTING ELEVATOR VENT WITHIN THE SHAFT FOR THE NEW ELEVATOR. GC RESPONSIBLE FOR INITIAL INVESTIGATION. REFER TO ADD-ALT #01 FOR ADDITIONAL INFORMATION SHOULD THE EXISTING VENT BE INSUFFICIENT
6. IF ADDITIONAL TRIM/FINISH MOULDING IS REQUIRED TO BE REMOVED TO FACILITATE THE DEMOLITION AND INSTALLATION OF THE NEW ELEVATOR, THE CONTRACTOR IS RESPONSIBLE FOR RECREATING TRIM, REF: KEYNOTE D1-14
7. ALL DIMENSIONS ARE TO BE VERIFIED IN FIELD BY CONTRACTOR.
8. GC RESPONSIBLE FOR DETERMINING THE EXTENT OF WALL & TRIM DEMOLITION REQUIRED FOR THE REMOVAL OF THE EXISTING ELEVATOR CAB AND ASSOCIATED EQUIPMENT. DEMOLITION DRAWINGS PRESENTED HEREIN PROVIDE DESIGN INTENT.
9. GC RESPONSIBLE FOR PROVIDING SAFETY ENCLOSURE AT ALL LANDINGS AFTER DEMOLITION AND PRIOR TO NEW ELEVATOR INSTALLATION TO ENSURE BUILDING OCCUPANT SAFETY.

DEMOLITION FLOOR PLAN SYMBOLS

EXISTING DOOR TO REMAIN

EXISTING DOOR TO BE DEMOLISHED

EXISTING WALL TO REMAIN

EXISTING WALL TO BE DEMOLISHED

0' 2' 4' 8' 16'

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25 DORRANCE STREET
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PROJECT STATUS:
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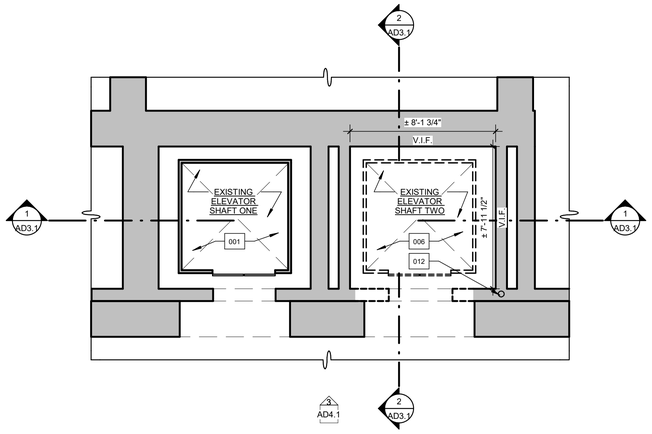
DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

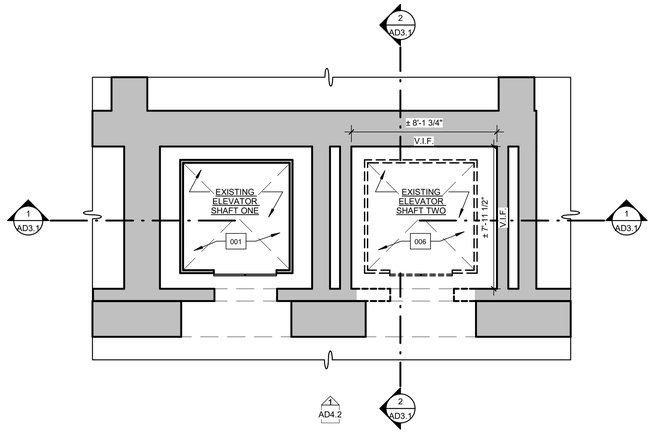
REVISIONS:

DRAWING TITLE:
DEMOLITION FLOOR PLANS

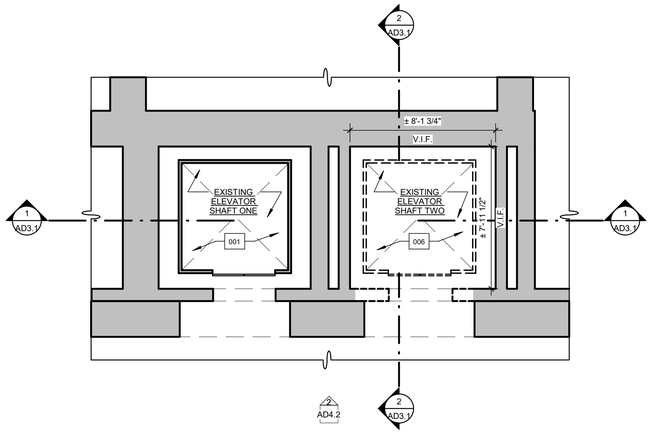
DRAWING NO.:
AD1.1



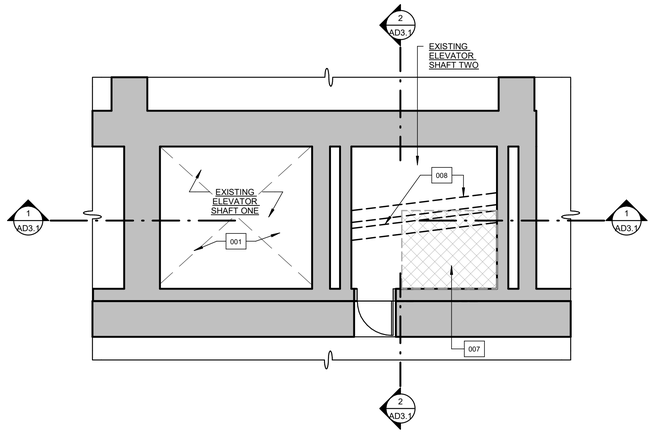
1 THIRD FLOOR DEMOLITION PLAN
1/4" = 1'-0"



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

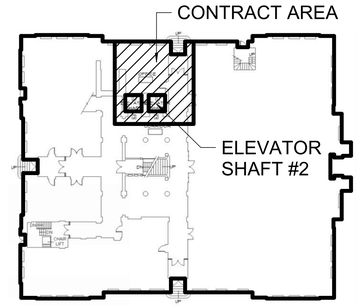


3 FIFTH FLOOR DEMOLITION PLAN
1/4" = 1'-0"



4 PENTHOUSE DEMOLITION PLAN
1/4" = 1'-0"

NOTE: HOISTWAY ACCESS DOORS ARE CONNECTED TO ELEVATOR POWER. GC TO COORDINATE WITH OWNER FOR ACCESS.



KEY PLAN
N.T.S.

KEYNOTES - DEMOLITION

001	AREA NOT IN SCOPE.
002	REMOVE AND DISPOSE EXISTING HVAC EQUIPMENT TO ACCOMODATE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
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DEMOLITION FLOOR PLAN SYMBOLS

EXISTING DOOR TO REMAIN

EXISTING DOOR TO BE DEMOLISHED

EXISTING WALL TO REMAIN

EXISTING WALL TO BE DEMOLISHED

0' 2' 4' 8' 16'

N

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PROJECT STATUS:

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DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

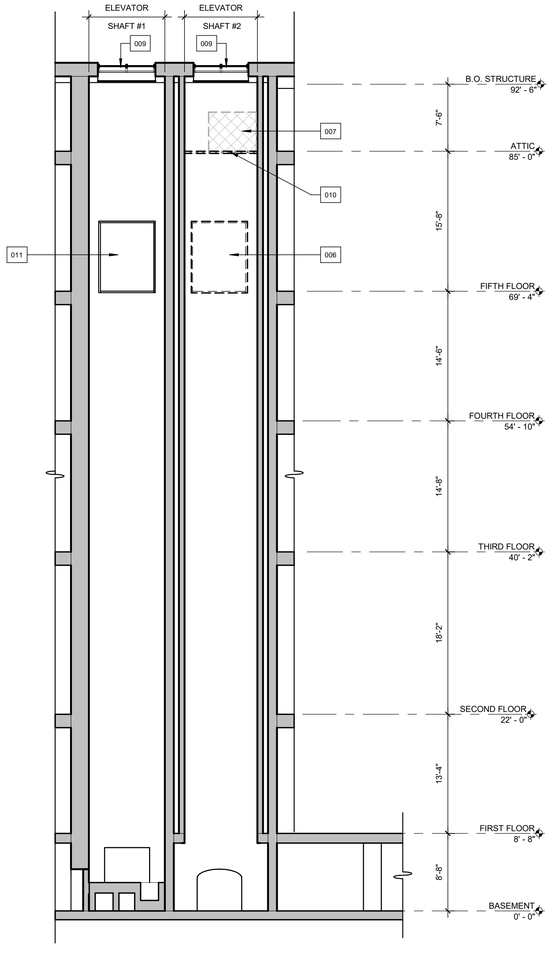
REVISIONS:

DRAWING TITLE:

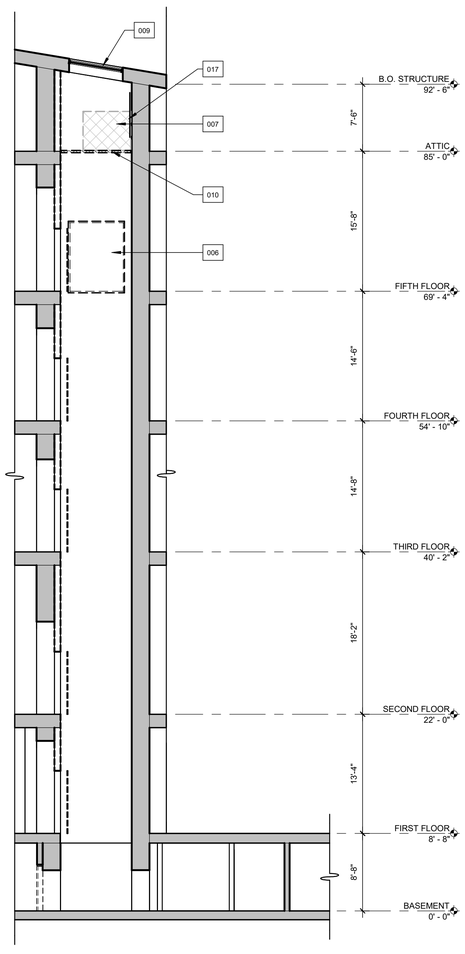
DEMOLITION
FLOOR PLANS

DRAWING NO.:

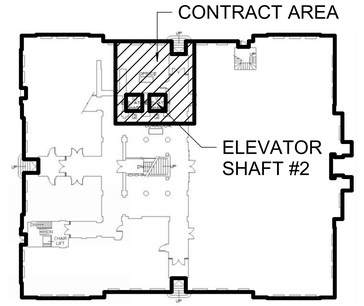
AD1.2



1 DEMOLITION LONGITUDINAL SECTION
1/8" = 1'-0"



2 DEMOLITION TRANSVERSE SECTION - ELEVATOR SHAFT #2
1/8" = 1'-0"



KEY PLAN
N.T.S.

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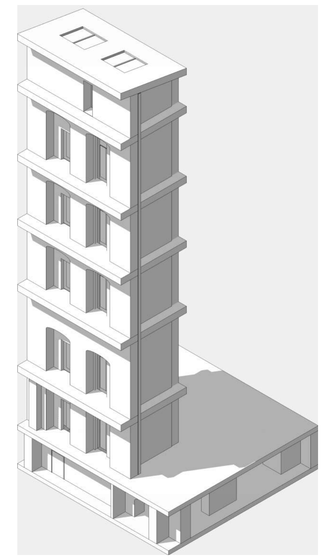
4. GC TO COORDINATE WITH OWNER AND ARCHITECT BEFORE REMOVING ANY ADDITIONAL ELEMENTS DISCOVERED DURING DEMOLITION; GC TO PROVIDE NECESSARY DOCUMENTATION.
5. THE INTENT IS TO UTILIZE THE EXISTING ELEVATOR VENT WITHIN THE SHAFT FOR THE NEW ELEVATOR. GC RESPONSIBLE FOR INITIAL INVESTIGATION. REFER TO ADD-ALT #01 FOR ADDITIONAL INFORMATION SHOULD THE EXISTING VENT BE INSUFFICIENT
6. IF ADDITIONAL TRIM/FINISH MOULDING IS REQUIRED TO BE REMOVED TO FACILITATE THE DEMOLITION AND INSTALLATION OF THE NEW ELEVATOR, THE CONTRACTOR IS RESPONSIBLE FOR RECREATING TRIM, REF: KEYNOTE D1-14
7. ALL DIMENSIONS ARE TO BE VERIFIED IN FIELD BY CONTRACTOR.
8. GC RESPONSIBLE FOR DETERMINING THE EXTENT OF WALL & TRIM DEMOLITION REQUIRED FOR THE REMOVAL OF THE EXISTING ELEVATOR CAB AND ASSOCIATED EQUIPMENT. DEMOLITION DRAWINGS PRESENTED HEREIN PROVIDE DESIGN INTENT.
9. GC RESPONSIBLE FOR PROVIDING SAFETY ENCLOSURE AT ALL LANDINGS AFTER DEMOLITION AND PRIOR TO NEW ELEVATOR INSTALLATION TO ENSURE BUILDING OCCUPANT SAFETY.



0' 2' 4' 8' 16'

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HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

PROVIDENCE CITY HALL ELEVATOR REPLACEMENT

25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

REVISIONS:

DRAWING TITLE:

DEMOLITION SECTIONS

DRAWING NO.:

AD3.1

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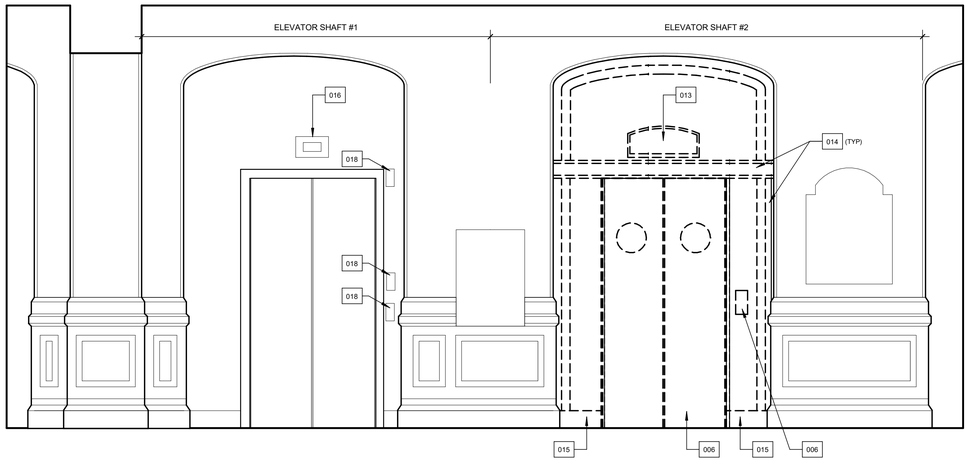
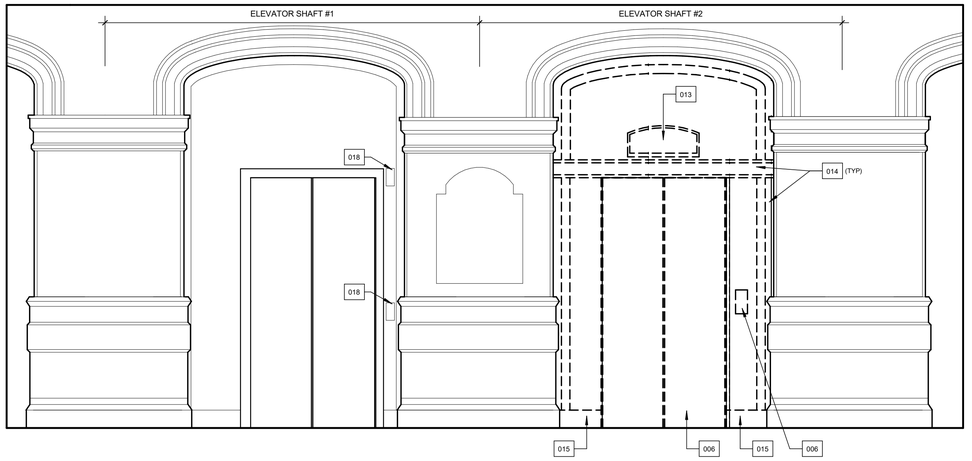


1 DEMOLITION FIRST FLOOR ELEVATION
1/2" = 1'-0"



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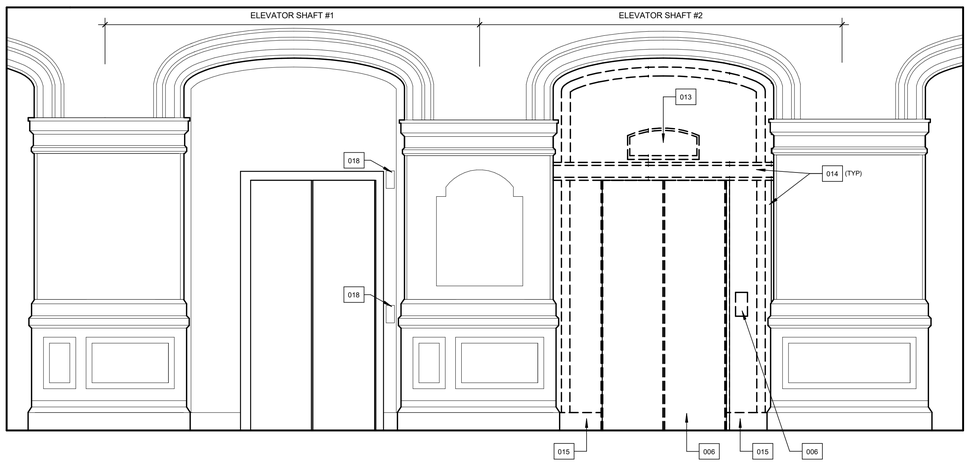
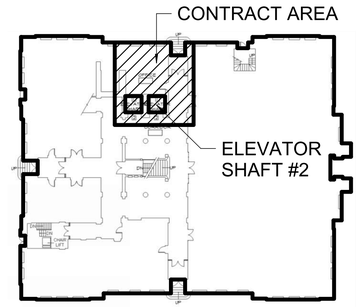
1/2" = 1'-0"



3 DEMOLITION THIRD FLOOR ELEVATION
1/2" = 1'-0"



KEY PLAN
N.T.S.

KEYNOTES - DEMOLITION

001	AREA NOT IN SCOPE.
002	REMOVE AND DISPOSE EXISTING HVAC EQUIPMENT TO ACCOMODATE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
003	EXISTING ELEVATOR #1 CONTROL EQUIPMENT TO REMAIN.
004	REMOVE AND DISPOSE OF EXISTING ELEVATOR #2 EQUIPMENT IN ITS ENTIRETY TO RECEIVE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
005	EXISTING SERVER TO REMAIN.
006	REMOVE AND DISPOSE OF EXISTING ELEVATOR CABIN AND ELEVATOR COMPONENTS IN ITS ENTIRETY; REFER TO ELEVATOR MANUFACTURER DRAWINGS FOR ADDTL INFORMATION.
007	REMOVE AND DISPOSE OF EXISTING HOISTWAY EQUIPMENT IN ITS ENTIRETY; REFER TO STRUCTURAL DRAWINGS AND ELEVATOR MANUFACTURER DRAWINGS FOR ADDITIONAL INFORMATION.
008	EXISTING HOISTWAY BEAM TO REMAIN; REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
009	EXISTING SKYLIGHT TO REMAIN. AS BASE SCOPE. REFER TO KEYNOTE 017 & ADD-ALT #01
010	REMOVE AND DISPOSE OF EXISTING STEEL GRATE IN ITS ENTIRETY; REFER TO ELEVATOR MANUFACTURER'S DRAWINGS FOR ADDITIONAL INFORMATION.
011	EXISTING ELEVATOR CABIN TO REMAIN.
012	EXISTING PLUMBING PIPE TO REMAIN.
013	REMOVE AND SALVAGE EXISTING ELEVATOR INDICATOR TO BE REINSTALLED DURING NEW WORK.
014	REMOVE AND SALVAGE EXISTING TRIMWORK TO BE USED AS A TEMPLATE FOR NEW WORK. DISPOSE AFTERWARDS.
015	REMOVE AND DISPOSE OF EXISTING WALL BASE IN ITS ENTIRETY.
016	REMOVE AND SALVAGE EXISTING ELEVATOR INDICATOR. PATCH AND REPAIR AS NEEDED TO RECIEVE NEW WORK.
017	GC TO VERIFY THAT EXISTING VENT STACK HAS BEEN DECOMMISSIONED; NOTIFY OWNER ARCHITECT OF FINDINGS BEFORE PRECEDING WITH NEW WORK.
018	EXISTING INDICATOR/ELEVATOR COMPONENT TO REMAIN.
019	COORDINATE EXTENT OF ELEVATOR PIT WORK WITH MEP+FP & STRUCTURAL DRAWINGS.

GENERAL NOTES - DEMOLITION

1. ELEVATOR #1 TO REMAIN OPERATIONAL AT ALL TIMES DURING CONSTRUCTION.
2. DEMOLITION TO OCCUR DURING STANDARD WORKING HOURS; GC TO COORDINATE WITH OWNER.
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0' 2' 4' 8' 16'

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ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

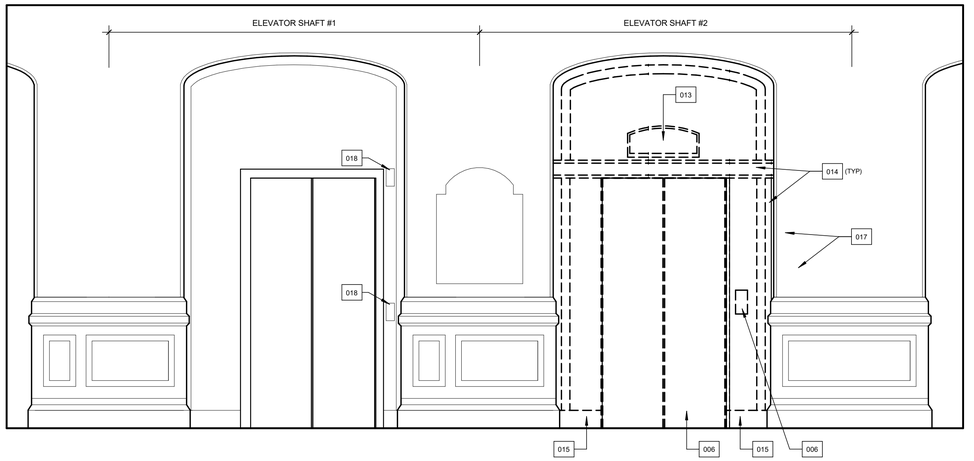
REVISIONS:

DRAWING TITLE:

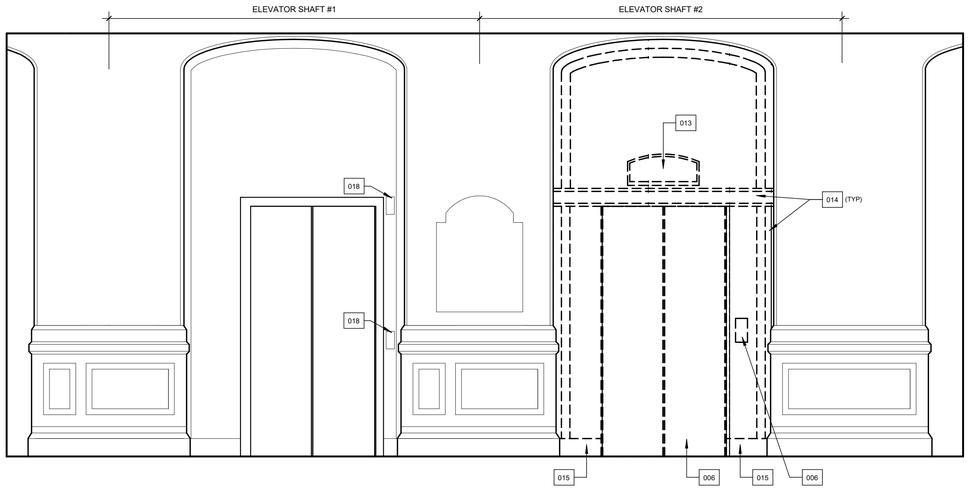
DEMOLITION INTERIOR ELEVATIONS

DRAWING NO.:

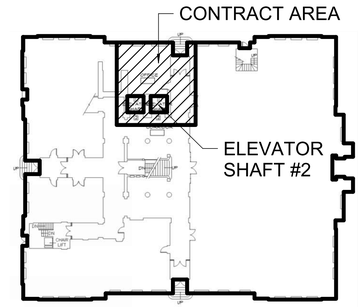
AD4.1



1 DEMOLITION FOURTH FLOOR ELEVATION
1/2" = 1'-0"



2 DEMOLITION FIFTH FLOOR ELEVATION
1/2" = 1'-0"



KEY PLAN
N.T.S.

KEYNOTES - DEMOLITION

001	AREA NOT IN SCOPE.
002	REMOVE AND DISPOSE EXISTING HVAC EQUIPMENT TO ACCOMODATE NEW WORK; REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
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005	EXISTING SERVER TO REMAIN.
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007	REMOVE AND DISPOSE OF EXISTING HOISTWAY EQUIPMENT IN ITS ENTIRETY; REFER TO STRUCTURAL DRAWINGS AND ELEVATOR MANUFACTURER DRAWINGS FOR ADDITIONAL INFORMATION.
008	EXISTING HOISTWAY BEAM TO REMAIN; REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION.
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GENERAL NOTES - DEMOLITION

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0' 2' 4' 8' 16'

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PROVIDENCE CITY HALL
ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

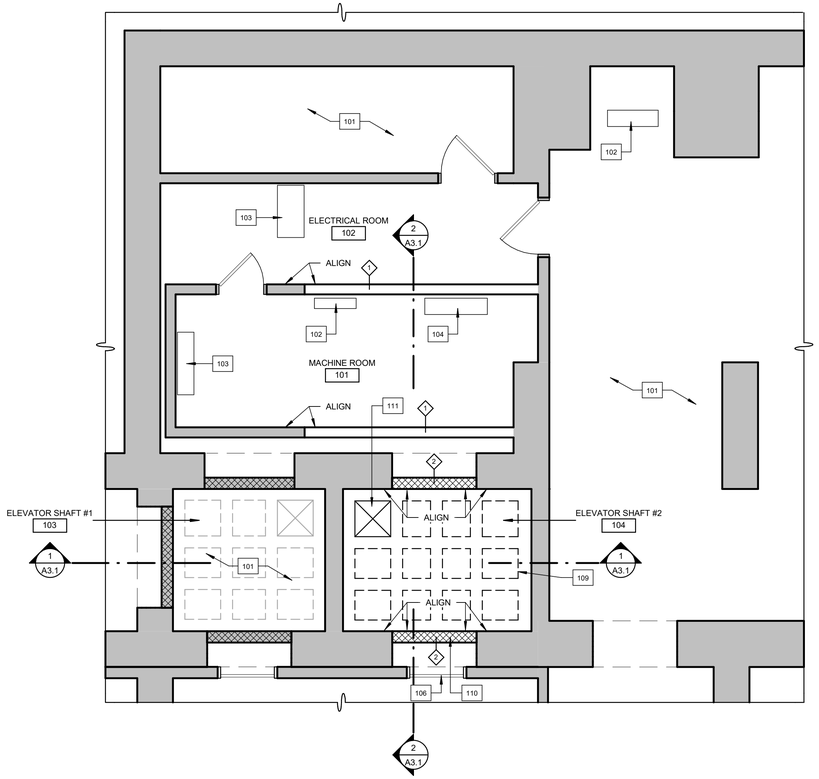
REVISIONS:

DRAWING TITLE:

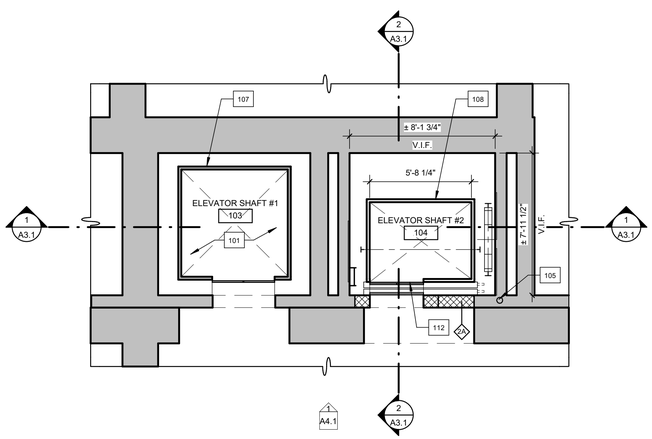
DEMOLITION INTERIOR ELEVATIONS

DRAWING NO.:

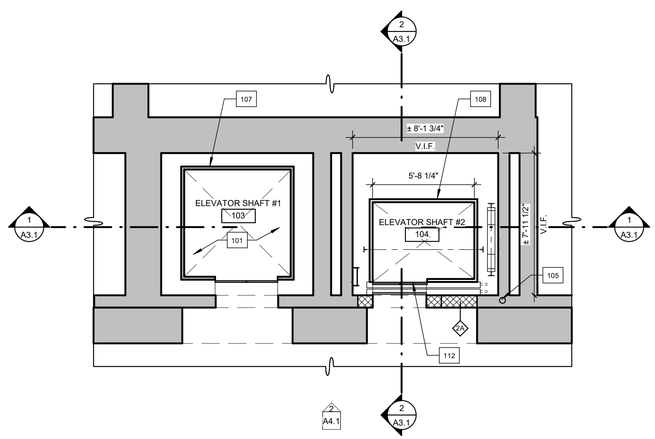
AD4.2



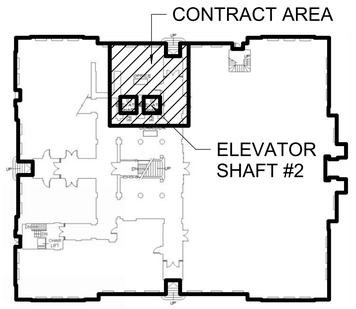
1 PROPOSED MACHINE ROOM PLAN
1/4" = 1'-0"



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



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



KEY PLAN
N.T.S.

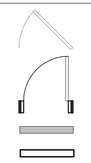
KEYNOTES - NEW WORK

101	AREA NOT IN SCOPE.
102	NEW HVAC EQUIPMENT; REFER TO MEP DRAWINGS FOR MORE INFORMATION.
103	EXISTING EQIPMENT TO REMAIN.
104	APPROXIMATE LOCATION OF NEW ELEVATOR EQUIPMENT; REFER TO ELEVATOR MANUFACTURER'S DRAWINGS FOR MORE INFORMATION.
105	EXISTING PIPE TO REMAIN
106	PIN EXISTING DOOR CLOSED.
107	EXISTING ELEVATOR CAB AND SHAFT TO REMAIN.
108	NEW ELEVATOR CABIN TO BE PROVIDED AND INSTALLED BY ELEVATOR CONTRACTOR. REFER TO ELEVATOR MANUFACTURER DRAWINGS FOR MORE INFORMATION. FINISHES TO MATCH EXISTING ADJACENT.
109	PROPOSED CONCRETE SLAB, WALLS, AND SUMP PIT; REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
110	INFILL EXISTING OPENINGS WITH 8" CMU, GROUTED FULL, TYP.
111	SUMP PIT, COORDINATE EXACT LOCATION WITH ELEVATOR MANUFACTURER; PROVIDE STEEL GRATING COVER; REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
112	INSTALL NEW ELEVATOR DOOR AND HARDWARE PER ELEVATOR MANUFACTURER'S INSTRUCTIONS.
113	EXISTING HOISTWAY BEAM TO REMAIN; REFER TO STRUCTURAL DRAWINGS FOR MORE INFO.
114	EXISTING SKYLIGHT TO REMAIN.
115	NEW SAFETY STEEL GRATE; REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
116	NEW ELEVATOR CABIN TO BE PROVIDED AND INSTALLED BY ELEVATOR CONTRACTOR. REFER TO ELEVATOR MANUFACTURER DRAWINGS FOR MORE INFORMATION. FINISHES TO MATCH EXISTING ADJACENT.
117	LOCATION OF SALVAGED ELEVATOR INDICATOR.
118	ADD-ALT #02: ANTIQUE ELEVATOR INDICATOR REPLICA TO BE FURNISHED AND INSTALLED BY CONTRACTOR.
119	NEW ELEVATOR COMPONENTS; REFER TO ELEVATOR MANUFACTURER'S DRAWINGS FOR MORE INFORMATION.
120	NEW ELEVATOR DOOR. REFER TO ELEVATOR MANUFACTURER'S DRAWING FOR MORE INFORMATION.
121	NEW WOOD TRIM PROFILE, GC TO COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.
122	WALL BASE, PROFILE AND FINISH TO MATCH EXISTING ELEVATOR #1 WALL BASE.
123	EXISTING WALL BASE TO REMAIN.
124	EXISTING ELEVATOR DOOR AND DOOR FRAME TO REMAIN.
125	EXISTING WOOD TRIM TO REMAIN (SHOWN GRAY).
127	UTILIZE EXISTING VENT AND VENT STACK AS NEEDED TO ACCOMMODATE NEW ELEVATOR VENT; GC TO COORDINATE WITH OWNER AND ARCHITECT TO VERIFY IF THE EXISTING VENT STACK HAS BEEN DECOMMISSIONED BEFORE STARTING NEW WORK.
128	REINSTALL SALVAGED ELEVATOR INDICATOR AND ALL ASSOCIATED ELECTRICAL COMPONENTS. ENSURE A CLEAN INSTALLATION. LOCATION SHOULD MATCH INDICATORS AT UPPER FLOOR LOCATIONS

GENERAL NOTES - NEW WORK

1. PATCH & REPAIR SURFACE OF SHAFT DAMAGED BY REMOVAL OF ELEVATOR CABIN & COMPONENTS.
2. ELEVATOR #1 TO REMAIN OPERATIONAL AT ALL TIMES.
3. DEMOLITION TO OCCUR OUTSIDE STANDARD SERVICE HOURS; GC TO COORDINATE WITH OWNER.
4. ALL NEW FLOOR PENETRATIONS TO BE 2-HOUR FIRE-RATED.

FLOOR PLAN SYMBOLS



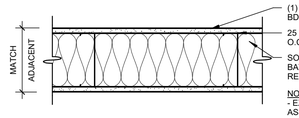
EXISTING DOOR TO REMAIN

NEW DOOR

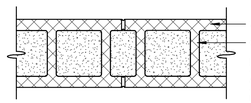
EXISTING WALL TO REMAIN

NEW WALL CONSTRUCTION; SEE WALL TYPES

WALL TYPES



1 F.R. ASSEMBLY - UL-419
2 HR. FIRE RATING



2 F.R. ASSEMBLY - UL U906
2 HR. FIRE RATING
2A: SIM TO WALL TYPE 2, ADD 5/8" GWB TO BUILDING INTERIOR SIDE ON 7/8" HIGH-HAT FURRING

0' 2' 4' 8' 16'

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ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

REVISIONS:

DRAWING TITLE:
PROPOSED FLOOR PLANS

DRAWING NO.:
A1.1

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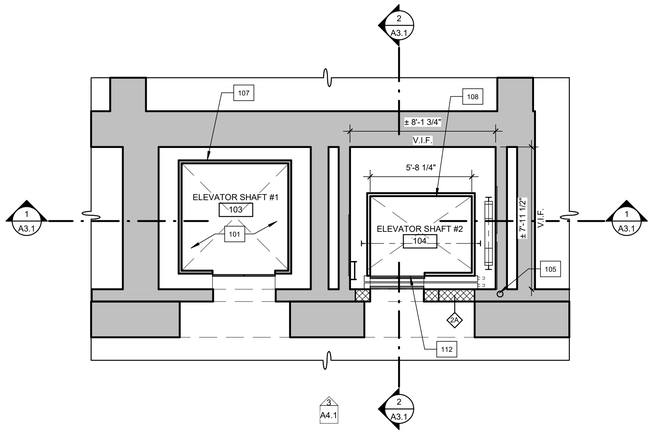
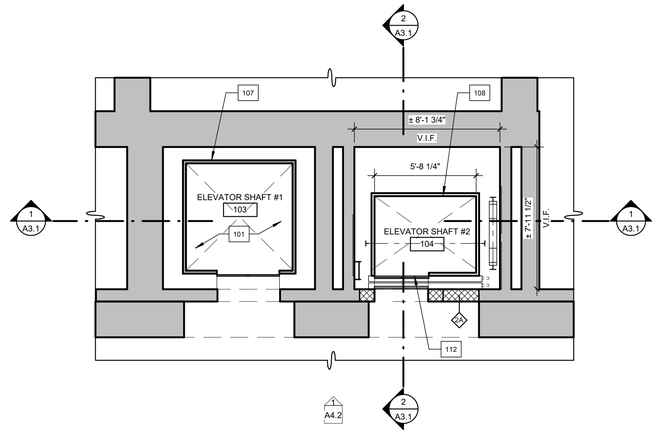
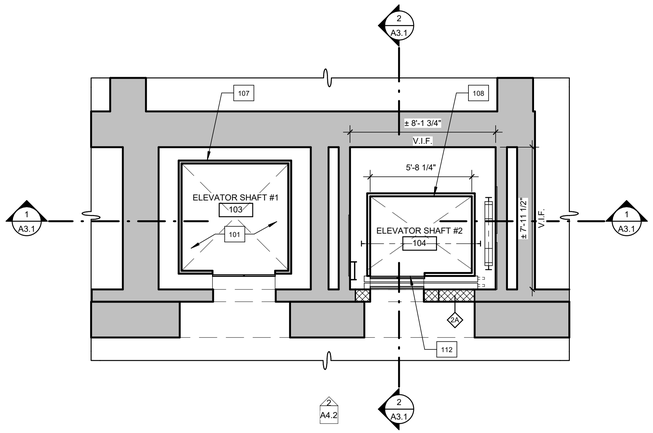


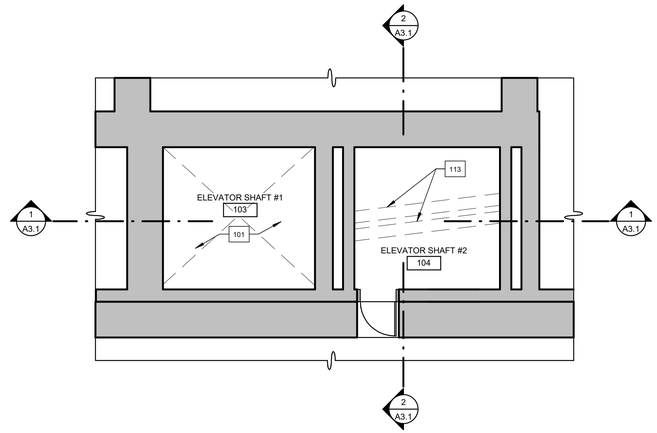
1 PROPOSED THIRD FLOOR PLAN
1/4" = 1'-0"



2 PROPOSED FOURTH FLOOR PLAN
1/4" = 1'-0"

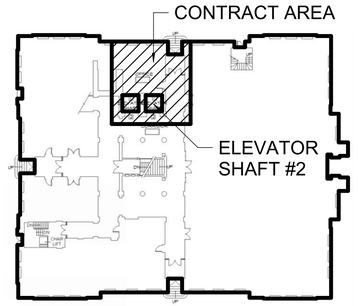


3 PROPOSED FIFTH FLOOR PLAN
1/4" = 1'-0"



4 PROPOSED ATTIC PLAN
1/4" = 1'-0"

NOTE: HOISTWAY ACCESS DOORS ARE CONNECTED TO ELEVATOR POWER. GC TO COORDINATE WITH OWNER FOR ACCESS.



KEY PLAN
N.T.S.

KEYNOTES - NEW WORK

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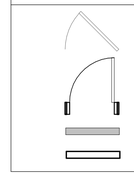
120	NEW ELEVATOR DOOR. REFER TO ELEVATOR MANUFACTURER'S DRAWING FOR MORE INFORMATION.
121	NEW WOOD TRIM PROFILE, GC TO COORDINATE WITH ARCHITECT PRIOR TO INSTALLATION.
122	WALL BASE, PROFILE AND FINISH TO MATCH EXISTING ELEVATOR #1 WALL BASE.
123	EXISTING WALL BASE TO REMAIN.
124	EXISTING ELEVATOR DOOR AND DOOR FRAME TO REMAIN.
125	EXISTING WOOD TRIM TO REMAIN (SHOWN GRAY).
127	UTILIZE EXISTING VENT AND VENT STACK AS NEEDED TO ACCOMMODATE NEW ELEVATOR VENT; GC TO COORDINATE WITH OWNER AND ARCHITECT TO VERIFY IF THE EXISTING VENT STACK HAS BEEN DECOMMISSIONED BEFORE STARTING NEW WORK.
128	REINSTALL SALVAGED ELEVATOR INDICATOR AND ALL ASSOCIATED ELECTRICAL COMPONENTS. ENSURE A CLEAN INSTALLATION. LOCATION SHOULD MATCH INDICATORS AT UPPER FLOOR LOCATIONS

GENERAL NOTES - NEW WORK

1. PATCH & REPAIR SURFACE OF SHAFT DAMAGED BY REMOVAL OF ELEVATOR CABIN & COMPONENTS.
2. ELEVATOR #1 TO REMAIN OPERATIONAL AT ALL TIMES.
3. DEMOLITION TO OCCUR OUTSIDE STANDARD SERVICE HOURS; GC TO COORDINATE WITH OWNER.
4. ALL NEW FLOOR PENETRATIONS TO BE 2-HOUR FIRE-RATED.

FLOOR PLAN SYMBOLS



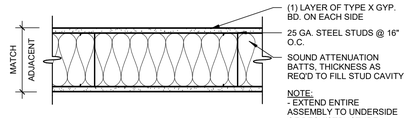
EXISTING DOOR TO REMAIN

NEW DOOR

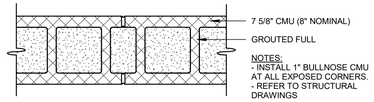
EXISTING WALL TO REMAIN

NEW WALL CONSTRUCTION; SEE WALL TYPES

WALL TYPES



1 F.R. ASSEMBLY - UL-419
2 HR. FIRE RATING



2 F.R. ASSEMBLY - UL U906
2 HR. FIRE RATING
2A: SIM TO WALL TYPE 2, ADD 5/8" GWB TO BUILDING INTERIOR SIDE ON 7/8" HIGH-HAT FURRING

0' 2' 4' 8' 16'

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(401) 400.ARCH
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STAMP:

PROVIDENCE CITY HALL
ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

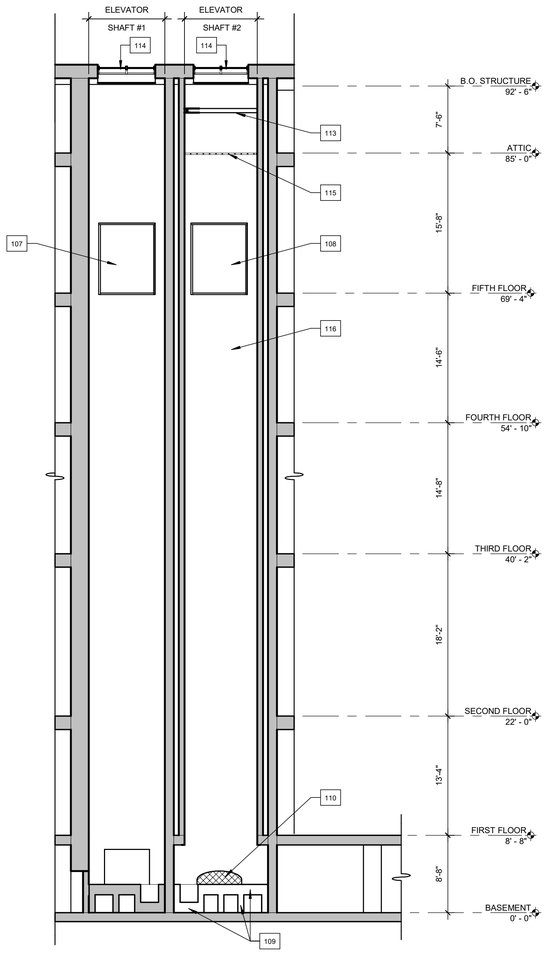
PROJECT STATUS:
BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

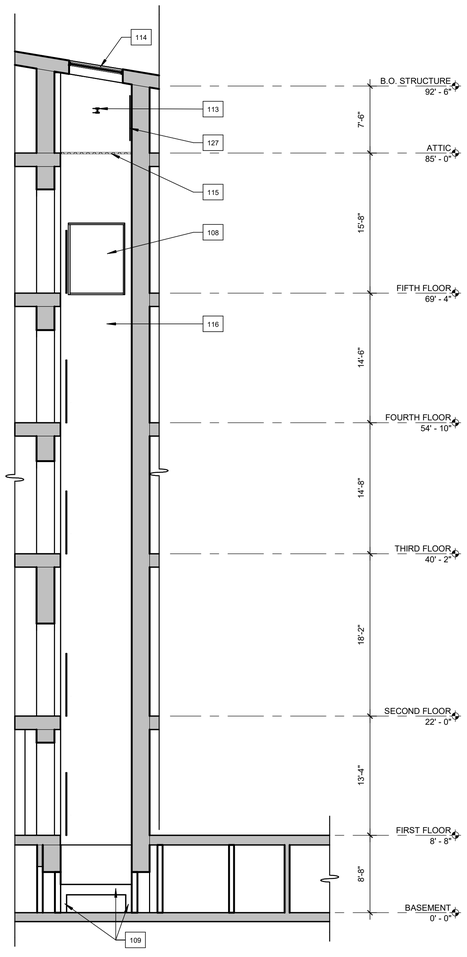
REVISIONS:

DRAWING TITLE:
PROPOSED FLOOR PLANS

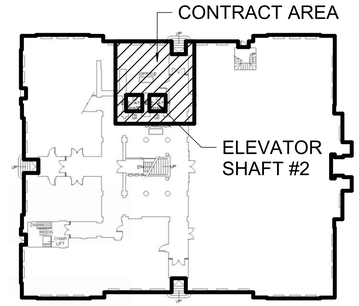
DRAWING NO.:
A1.2



1 PROPOSED LONGITUDINAL SECTION
1/8" = 1'-0"



2 PROPOSED TRANSVERSE SECTION - ELEVATOR SHAFT #2
1/8" = 1'-0"



KEY PLAN
N.T.S.

KEYNOTES - NEW WORK

101	AREA NOT IN SCOPE.
102	NEW HVAC EQUIPMENT; REFER TO MEP DRAWINGS FOR MORE INFORMATION.
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106	PIN EXISTING DOOR CLOSED.
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109	PROPOSED CONCRETE SLAB, WALLS, AND SUMP PIT; REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
110	INFILL EXISTING OPENINGS WITH 8" CMU, GROUTED FULL, TYP.
111	SUMP PIT; COORDINATE EXACT LOCATION WITH ELEVATOR MANUFACTURER; PROVIDE STEEL GRATING COVER; REFER TO STRUCTURAL DRAWINGS FOR MORE INFORMATION.
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0' 2' 4' 8' 16'

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11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
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STAMP:

PROVIDENCE CITY HALL ELEVATOR REPLACEMENT

25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

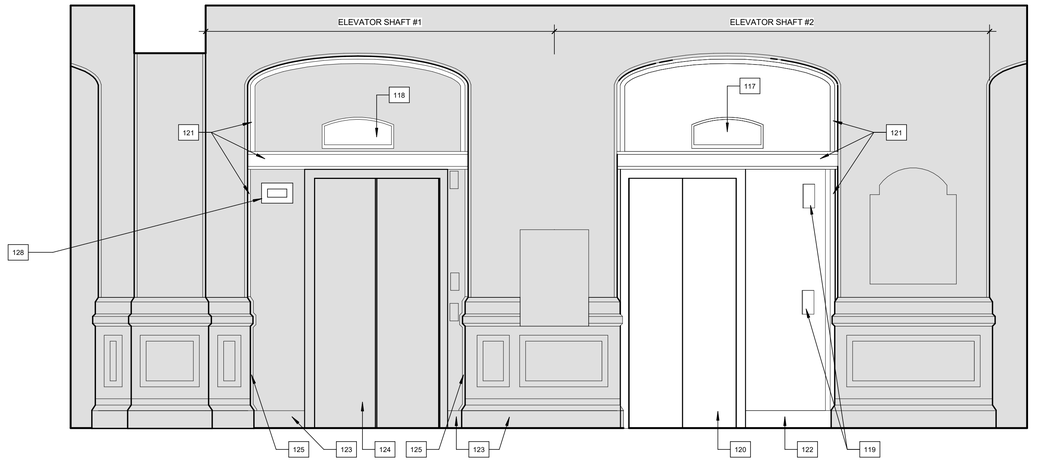
REVISIONS:

DRAWING TITLE:

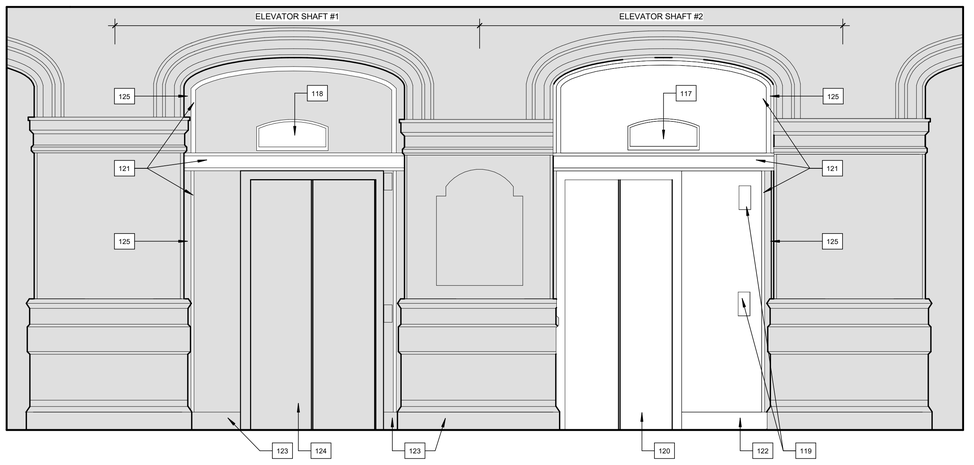
PROPOSED SECTIONS

DRAWING NO.:

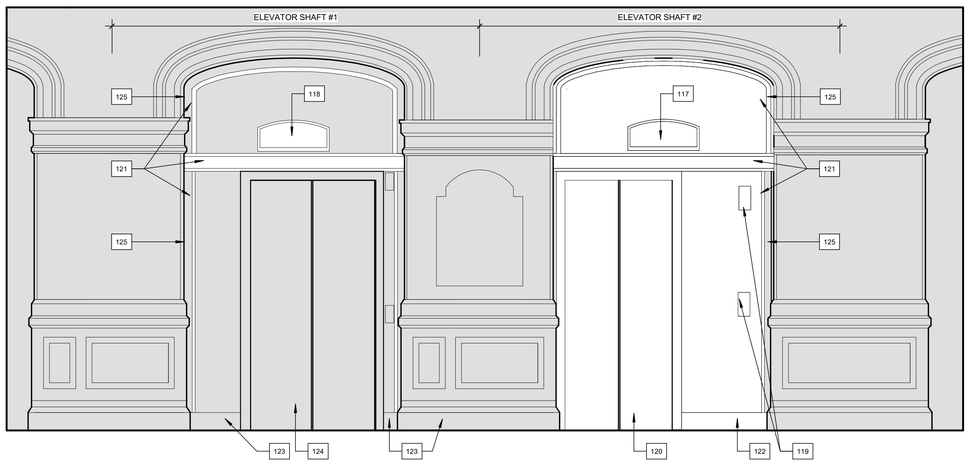
A3.1



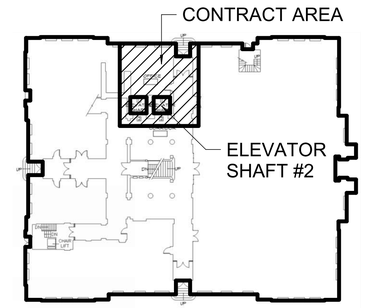
1 PROPOSED FIRST FLOOR ELEVATION
1/2" = 1'-0"



2 PROPOSED SECOND FLOOR ELEVATION
1/2" = 1'-0"



3 PROPOSED THIRD FLOOR ELEVATION
1/2" = 1'-0"



KEY PLAN
N.T.S.

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0' 2' 4' 8' 16'

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11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
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STAMP:

PROVIDENCE CITY HALL
ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

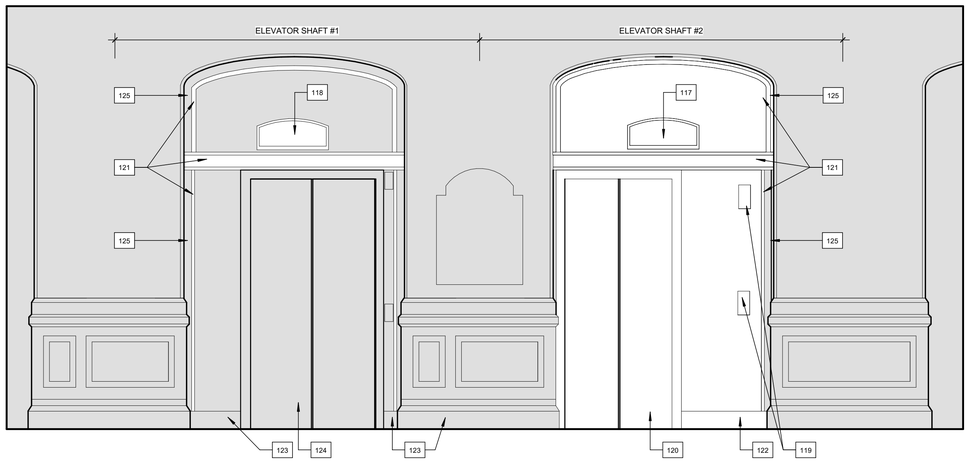
PROJECT STATUS:
BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

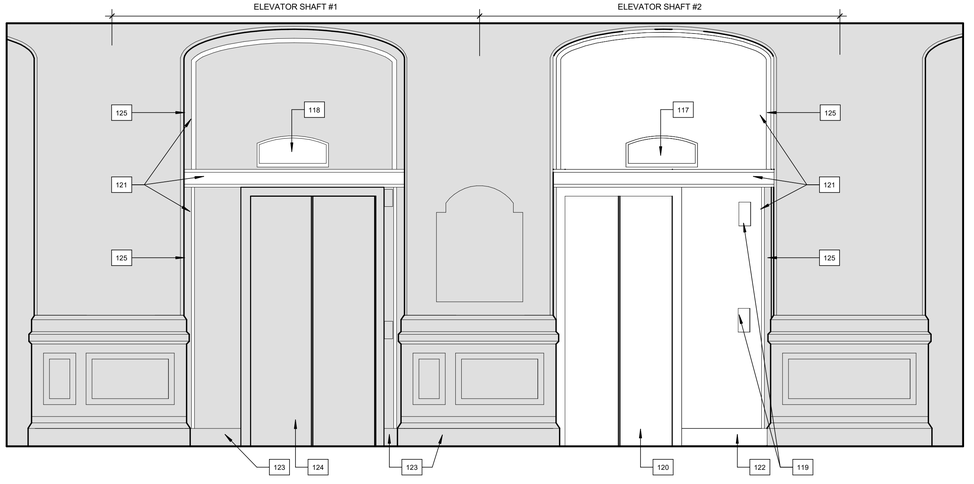
REVISIONS:

DRAWING TITLE:
PROPOSED INTERIOR ELEVATIONS

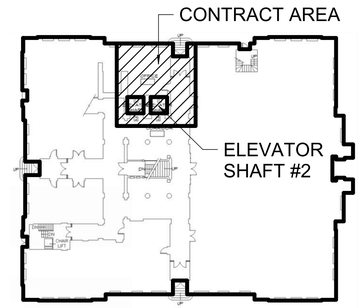
DRAWING NO.:
A4.1



1 PROPOSED FOURTH FLOOR ELEVATION
1/2" = 1'-0"



2 PROPOSED FIFTH FLOOR ELEVATION
1/2" = 1'-0"



KEY PLAN
N.T.S.

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0' 2' 4' 8' 16'

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

PROVIDENCE CITY HALL
ELEVATOR REPLACEMENT
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
BID SET

DATE:	01/17/2025
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	BB

REVISIONS:

DRAWING TITLE:
PROPOSED INTERIOR ELEVATIONS

DRAWING NO.:
A4.2

1/17/2025 11:28:25 PM
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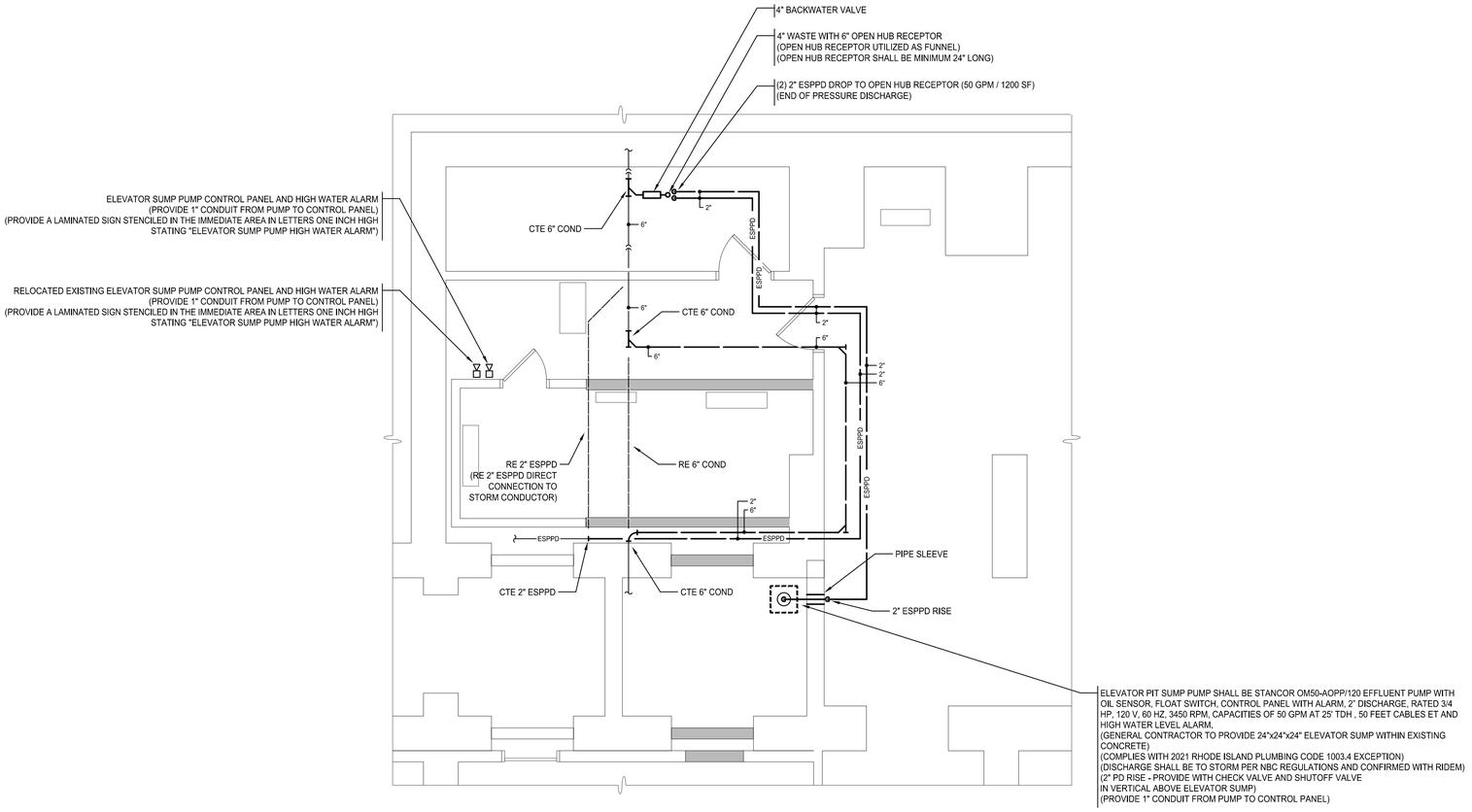
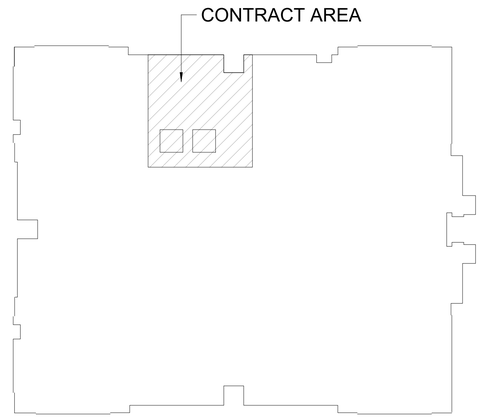


1 PROPOSED MACHINE ROOM PLAN
1/4" = 1'-0"



PLUMBING LEGEND

PIPING

SYMBOL	ABBREVIATION	DESCRIPTION
		NEW WORK (ABOVE GROUND) (PERTAINS TO ALL SYSTEM)
	ETR	EXISTING WORK TO REMAIN (ABOVE GROUND)(PERTAINS TO ALL SYSTEM)
	RE	REMOVE EXISTING (ABOVE GROUND) (PERTAINS TO ALL SYSTEM)
EC	EC	ELECTRICAL CONDUIT
ESPPD	ESPPD	ELEVATOR SUMP PUMP PRESSURE DISCHARGE
	COND	STORM WATER INTERNAL CONDUCTOR (PRIMARY)

GENERAL

SYMBOL	ABBREVIATION	DESCRIPTION
	BE	45° VERTICAL BEND
	CO	CLEANOUT
	CTE	CONNECT TO EXISTING
	DN	DOWN (PENETRATES LEVEL BELOW)
		DROP (DOES NOT PENETRATE LEVEL BELOW)
		RISE (DOES NOT PENETRATE LEVEL ABOVE)
	SLV	PIPE SLEEVE

PLUMBING GENERAL NOTES

1. BIDDERS SHALL UTILIZE A COMPLETE SET OF PLUMBING BIDDING DOCUMENTS IN PREPARING OF BID INCLUDING DRAWINGS AND SPECIFICATIONS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR ERRORS OR MISINTERPRETATIONS RESULTING FROM THE USE OF INCOMPLETE SETS OF PLUMBING BIDDING DOCUMENTS.

   THESE PLUMBING BIDDING DOCUMENTS SHALL INCLUDE:

   DRAWINGS
   P0.1 PLUMBING LEGEND, GENERAL NOTES AND BASEMENT PART PLAN
   P1.0 PLUMBING SPECIFICATIONS
   P1.1 PLUMBING SPECIFICATIONS (CONT.)

2. THE WORK COVERED CONSISTS OF FURNISHING ALL LABOR AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND READY FOR CONTINUOUS OPERATION, THE PLUMBING SYSTEMS, APPARATUS AND EQUIPMENT FOR THIS PROJECT.

3. ALL EQUIPMENT AND MATERIALS FURNISHED UNDER THE PLUMBING SUB-CONTRACT, LABOR AND TESTING PERFORMED HEREIN SHALL BE IN COMPLETE ACCORDANCE WITH THE STATE BUILDING CODE, LOCAL FUEL GAS AND PLUMBING CODES, ALL LOCAL CODES AND REGULATIONS, NATIONAL FIRE PROTECTION ASSOCIATION, INSURANCE REGULATIONS AND REQUIREMENTS GOVERNING SUCH WORK.

4. ANY AND ALL PERMITS REQUIRED FOR INSTALLATION OF ANY MATERIAL SHALL BE OBTAINED AS PART OF THE WORK OF THE SPECIFICATION INCLUDING ALL FEES OR EXPENSES INCURRED.

5. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION OF ALL PLUMBING FIXTURES AND EQUIPMENT.

6. ALL LOCATIONS OF EXISTING PIPING AND EQUIPMENT INDICATED HAS BEEN OBTAINED FROM EXISTING CONDITIONS DURING SITE VISITS. THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING PIPING, PIPE SIZES, POINTS OF CONNECTIONS TO EXISTING PIPING AND EQUIPMENT PRIOR TO COMMENCEMENT OF WORK.

0' 2' 4' 8' 16'

N

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11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

eds
ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	TCC
CHECKED BY:	GGM

REVISIONS:

DRAWING TITLE:
PLUMBING LEGEND, GENERAL NOTES AND BASEMENT PART PLAN

DRAWING NO.:
P0.1

ABBREVIATIONS

GENERAL ABBREVIATIONS:

AAV	AUTOMATIC AIR VENT	L	LENGTH
ADD'L	ADDITIONAL	LAT	LEAVING AIR TEMPERATURE
AFF	ABOVE FINISHED FLOOR	LB	POUND
AMS	AIR FLOW MEASURING STATION	LF	LINEAR FEET
ALT	ALTITUDE OR ALTERNATE	LD	LINEAR DIFFUSER
AMP	AMPERE	LRA	LOCKED ROTOR AMPS
AP	ACCESS PANEL	LVD	LOUVERED DOOR
APD	AIR PRESSURE DROP	LVG	LEAVING
ARCH	ARCHITECT	LWT	LEAVING WATER TEMPERATURE
ATC	AUTOMATIC TEMP. CONTROL		
ATM	ATMOSPHERE	MAX	MAXIMUM
AVG	AVERAGE	MBH	THOUSAND BTH
		MCA	MINIMUM CIRCUIT AMPS
BDD	BACKDRAFT DAMPER	MD	MOTOR OPERATED DAMPER
BG	BLAST GATE DAMPER	MECH	MECHANICAL
BHP	BRAKE HORSEPOWER	MEZZ	MEZZANINE
BI	BACKWARDS INCLINED	MFR	MANUFACTURER
BLDG	BUILDING	MIN	MINIMUM
BMS	BUILDING MANAGEMENT SYSTEM	MUA	MAKE-UP AIR
BOD	BOTTOM OF DUCT		
BOP	BOTTOM OF PIPE	N/A	NOT APPLICABLE
BSMT	BASEMENT	NC	NORMALLY CLOSED
BTU	BRITISH THERMAL UNIT	NC	NOISE CRITERIA
BTH	BTU PER HOUR	NIC	NOT IN CONTRACT
		NO	NORMALLY OPEN
CA	COMPRESSED AIR	No.	NUMBER
CDW	CONDENSER WATER	NOM	NOMINAL
CENT	CENTRIFUGAL	NTS	NOT TO SCALE
CF	CUBIC FEET		
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
CL	CENTERLINE	OD	OUTSIDE DIAMETER
C.L.	COLUMN LINE	ODP	OPEN DRIP PROOF
CND	CONDENSATE	OED	OPEN END DUCT
CLG	CEILING OR COOLING	OV	OUTLET VELOCITY
C.O.	CLEAN-OUT		
CO	CARBON MONOXIDE	PD	PRESSURE DROP
CO2	CARBON DIOXIDE	PH	PHASE
COL	COLUMN	PHC	PREHEAT COIL
CONN	CONNECTION	PBG	PLUMBING
CONTR	CONTRACTOR	POS	PROVIDED BY OTHER SECTION
CV	CONSTANT VOLUME	PSI	POUNDS PER SQUARE INCH
		PSIA	PSI ABSOLUTE
DB	DRY BULB TEMPERATURE	PSID	PSI DIFFERENTIAL
		PSIG	PSI GAUGE
DEG	DEGREE DIRECT	PVC	POLYVINYL CHLORIDE
DDC	DIGITAL CONTROL	PRV	PRESSURE REDUCING VALVE
DIA	DIAMETER		
DIFF	DIFFUSER	QTY	QUANTITY
DIM	DIMENSION		
DN	DOWN	R	RADIUS
DP	DIFFERENTIAL PRESSURE	RA	RETURN AIR
DWDI	DOUBLE WIDTH DOUBLE INLET	REG	REGISTER
DX	DIRECT EXPANSION	RET	RETURN
		REQD	REQUIRED
EA	EACH OR EXHAUST AIR	RH	RELATIVE HUMIDITY
EAT	ENTERING AIR TEMPERATURE	RLA	RUNNING LOAD AMPS
ECH	ELECTRIC CABINET HEATER	RLL	REFRIGERANT LIQUID LINE
EFF	EFFICIENCY	RM	ROOM
ELEC	ELECTRICAL	RPM	REVOLUTIONS PER MINUTE
ELEV	ELEVATION	RSL	REFRIGERANT SUCTION LINE
EMER	EMERGENCY		
EMS	ENERGY MANAGEMENT SYSTEM	SA	SUPPLY AIR
ENT	ENTER	SCH	SCHEDULE
ESP	EXTERNAL STATIC PRESSURE	SD	SMOKE DETECTOR
EWT	ENTERING WATER TEMPERATURE	SEN	SENSIBLE
EXH	EXHAUST	SHC	SENSIBLE HEAT CAPACITY
EXIST.	EXISTING	SP	STATIC PRESSURE
		SPECS	SPECIFICATIONS
F	FAHRENHEIT OR FAN	SQ	SQUARE
FA	FREE AREA	SF	SQUARE FEET
FD	FIRE DAMPER (ACCESS DOOR)	SS	STAINLESS STEEL
FLA	FULL LOAD AMPS	STL	STEEL
FLEX	FLEXIBLE	SUP	SUPPLY
FPM	FEET PER MINUTE	SWSI	SINGLE WITH SINGLE INLET
FPS	FEET PER SECOND		
FRP	FIBERGLASS REINFORCED PLASTIC	T	TEMPERATURE
FS	FLOW SWITCH	TEL	TELEPHONE
FT	FEET	TEFC	TOT. ENCLOSED FAN COOLED
FTR	FINNED TUBE RADIATION	TEMP	TEMPERATURE
		TSTAT	THERMOSTAT
G	GAS	TOD	TOP OF DUCT
GAL	GALLONS	TON	12,000 BTH
GALV	GALVANIZED	TOP	TOP OF PIPE
GC	GENERAL CONTRACTOR	TOT	TOTAL
GPH	GALLONS PER HOUR	TSP	TOTAL STATIC PRESSURE
GPM	GALLONS PER MINUTE	TYP	TYPICAL
GWB	GYPSUM WALL BOARD		
		V	VENT
HB	HOSE BIBB	VB	VACUUM BREAKER
HC	HEATING COIL	VD	VOLUME DAMPER
HEX	HEAT EXCHANGER	V	VOLTS (ELECTRICAL)
HGT	HEIGHT	VEL	VELOCITY
HP	HORSEPOWER		
HR	HOUR	W	WIDTH OR WATT
HTG	HEATING	W/	WITH
HW	HOT WATER	WB	WET BULB TEMPERATURE
HZ	HERTZ	WC	WATER COLUMN
		WG	WATER GAUGE
ID	INSIDE DIAMETER	WMS	WIRE MESH SCREEN
IN	INCHES	W/O	WITHOUT
		WPD	WATER PRESSURE DROP
KW	KILOWATT	WTD	WATER TEMPERATURE DIFF.

CONTROLS ABBREVIATIONS:

ACD	AUTOMATIC CONTROL DAMPER	LSPS	LOW STATIC PRESSURE SWITCH
ACV	AUTOMATIC CONTROL VALVE	LS	LEVEL SENSOR
AMS	AIR FLOW MEASURING STATION		
ALM	ALARM	MD	MOTORIZED DAMPER
ATC	AUTOMATIC TEMPERATURE CONTROL		
ATS	AIR TEMPERATURE SENSOR	NC	NORMALLY CLOSED (POWER LOSS)
		NO	NORMALLY OPEN (POWER LOSS)
BD	BACKDRAFT DAMPER		
BV	BYPASS VALVE	OAH	OUTSIDE AIR HUMIDITY SENSOR
		OAT	OUTSIDE AIR TEMP. SENSOR
CO2	CARBON DIOXIDE SENSOR		
CO	CARBON MONOXIDE SENSOR	RH	RELATIVE HUMIDITY
CT	CURRENT TRANSFORMER		
CV	CONTROL VALVE	S	SWITCH
		SP	STATIC PRESSURE SENSOR
DDC	DIRECT DIGITAL CONTROL	SD	SMOKE DETECTOR
DPS	DIFFERENTIAL PRESSURE SWITCH	SPD	SPEED CONTROL
DPT	DIFFERENTIAL PRESSURE SENSOR	S/S	START/STOP
DPV	DIFF. PRESSURE BYPASS VALVE		
DSD	DUCT MOUNTED SMOKE DETECTOR	T	THERMOSTAT
DWDI	DOUBLE WIDTH DOUBLE INLET	TS	TEMPERATURE SENSOR
ES	END SWITCH	WTS	WATER TEMPERATURE SENSOR
FM	FLOW METER/TRANSMITTER		
FZ	FREEZESTAT		
H	HUMIDISTAT		
HEPA	HIGH EFF. PARTICULATE AIR FILTER		
HGB	HOT GAS BYPASS		
HHL	HIGH HUMIDITY LIMIT SENSOR		
HOA	HANDS-OFF AUTOMATIC SWITCH		
HS	HUMIDITY SENSOR		
HZ	HERTZ		

EQUIPMENT ABBREVIATIONS:

AC	AIR CONDITIONING UNIT	GMS	GLYCOL MAKE-UP SYSTEM
ACU	AC CONDENSING UNIT	GUH	GAS FIRED UNIT HEATER
AHU	AIR HANDLING UNIT		
AS	AIR SEPARATOR	H	HUMIDIFIER
		HP	HEAT PUMP
B	BOILER	HPU	HP CONDENSING UNIT
BB	BASE BOARD	HV	HEATING & VENTILATING UNIT
BC	BRANCH CONTROLLER	HWC	HOT WATER COIL
BP	BOILER PUMP		
BT	BUFFER TANK	LV	LOUVER
CAC	CRITICAL COOLING AC UNIT	KEF	KITCHEN EXHAUST FAN
CC	COOLING COIL		
CCU	CC CONDENSING UNIT	MAU	MAKE-UP AIR UNIT
CEF	CEILING EXHAUST FAN	MCC	MOTOR CONTROL CENTER
CH	CHILLER		
CP	CIRCULATOR PUMP	P	PUMP
CT	COOLING TOWER	PTAC	PACKAGED TERMINAL AC UNIT
CUH	CABINET UNIT HEATER		
CWC	CHILLED WATER COIL	R	RETURN GRILLE
		REF	ROOF EXHAUST FAN
DC	DRY COOLER	RHP	RADIANT HEATING PANEL
DEF	DISHWASHER EXHAUST FAN	RTU	ROOF TOP UNIT
DSF	DESTRATIFICATION FAN		
		S	SUPPLY DIFFUSER
E	EXHAUST GRILLE	SA	SOUND ATTENUATOR
EBB	ELECTRIC BASE BOARD	SAC	SPLIT AC UNIT
ECH	ELECTRIC CABINET HEATER	SHP	SPLIT HEAT PUMP
ECH	ELECTRIC CEILING HEATER	SF	SUPPLY FAN
EF	EXHAUST FAN		
EV	ELEVATOR VENT	T	TRANSFER GRILLE
ET	EXPANSION TANK		
EUH	ELECTRIC UNIT HEATER	UH	UNIT HEATER
		UV	UNIT VENTILATOR
F	FURNACE		
FC	FAN COIL UNIT	VAV	VARIABLE AIR VOLUME BOX
FPB	FAN POWERED VAV	VFD	VARIABLE FREQUENCY DRIVE
FT	FINTUBE		
		WSHP	WATER SOURCE HEAT PUMP

MECHANICAL SYMBOL LEGEND

AIR DEVICES

- 4-WAY SUPPLY DIFFUSER
- 3-WAY SUPPLY DIFFUSER
- 2-WAY SUPPLY DIFFUSER
- 2-WAY CORNER SUPPLY DIFFUSER
- 1-WAY SUPPLY DIFFUSER
- RETURN REGISTER
- EXHAUST REGISTER
- SIDE WALL SUPPLY DIFFUSER
- SIDE WALL RETURN OR EXHAUST GRILLE

DUCTWORK

- STANDARD SIZE REDUCTION
- ASYMMETRICAL TRANSITION
- SQUARE-TO-ROUND TRANSITION
- STANDARD BRANCH TAKE-OFF
- ROUND BRANCH TAKE-OFF
- STANDARD TEE
- STANDARD TEE WITH TURNING VANES
- SLOPED DUCT RISE
- FIRE DAMPER ACCESS DOOR (FD)
- GREASE DUCT ACCESS DOOR
- DUCT RISE
- DUCT DROP
- STANDARD SQUARE ELBOW
- SQUARE ELBOW WITH TURNING VANES
- STANDARD RADIUS ELBOW (R=D)
- FIRE WRAPPED DUCTWORK
- ACOUSTICALLY LINED DUCTWORK
- OPEN ENDED DUCT OUTLET
- OPEN ENDED DUCT INTAKE
- OPEN ENDED DUCT OUTLET W/ SCREEN
- OPEN ENDED DUCT INTAKE W/ SCREEN

CONTROLS

- TIME CLOCK
- THERMOSTAT
- TS — TEMPERATURE SENSOR
- DSD — DUCT MOUNTED SMOKE DETECTOR

AIR DAMPERS

- MANUALLY ADJUSTABLE VOLUME DAMPER
- FIRE DAMPER
- M — MOTORIZED DAMPER

TAGS

- X / # / CFM — DIFFUSER TAG
- X / # — EQUIPMENT TAG
- # — REVISION
- CONNECT NEW TO EXISTING

LEGEND NOTE:
NOT ALL SYMBOLS ARE NECESSARILY USED. ABSENCE OF A SYMBOL ON THE DRAWINGS DOES NOT NECESSARILY MEAN IT IS NOT REQUIRED. REFER TO DETAILS & SPECIFICATIONS FOR A COMPLETE UNDERSTANDING OF WORK REQUIRED.

GENERAL CONSTRUCTION NOTES:

1. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
2. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.
3. THIS CONTRACTOR, PRIOR TO SUBMITTING HIS BID, SHALL VISIT THE PROJECT SITE TO FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS. REQUESTS FOR COMPENSATION FOR EXTRA WORK, WHICH WOULD HAVE BEEN EVIDENT BY COMPLIANCE WITH THE PREVIOUS STATEMENT, WILL NOT BE CONSIDERED. THE CONTRACTOR SHALL CONDUCT A THOROUGH FIELD INVESTIGATION TO VERIFY WORK SHOWN ON THE DRAWINGS. THE DRAWINGS REFLECT THE BEST AVAILABLE INFORMATION FROM EXISTING PLANS AND SITE INVESTIGATIONS.
4. THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW THE EXACT ROUTING OF SYSTEMS OR LOCATION OF COMPONENTS. THE EXACT LOCATIONS, DIMENSIONS AND ALL OTHER DETAILS OF EQUIPMENT ARE THE RESPONSIBILITY OF THIS CONTRACTOR. THIS CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE SPACE. PROVIDE ALL DUCT AND PIPE TRANSITIONS REQUIRED FOR CONNECTION TO EQUIPMENT.
5. THIS CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE OWNER AND/OR ENGINEER FOR EXPEDITING AND RESOLVE.
6. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP DUST AND DEBRIS WITHIN THE CONSTRUCTION AREA.
7. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
8. ALL OPENINGS IN WALLS SHALL BE KEPT PROPERLY SEALED AT ALL TIMES, EXCEPT WHEN BEING WORKED ON TO PRECLUDE THE POSSIBILITY OF FLOODING DUE TO STORM OR OTHER CAUSES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT, AND ENVIRONMENTAL CONDITIONS.
10. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES PRIOR TO FABRICATION, PURCHASE AND/OR INSTALLATION OF ALL WORK. ALL OFFSETS IN PIPING AND DUCTS TO AVOID OBSTRUCTIONS SHALL BE PROVIDED AT NO COST TO THE OWNER.
11. CONTRACTOR SHALL REFER TO THE COMPLETE SET OF CONTRACT DOCUMENTS INCLUDING SPECIFICATIONS AND OTHER TRADES FOR A FULL UNDERSTANDING OF ALL WORK REQUIRED.
12. WHERE USED THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
13. PROVIDE ALL REQUIRED RIGGING TO ACCOMMODATE THE REMOVAL & INSTALLATION OF ALL EQUIPMENT.
14. PROVIDE ACCESS PANELS FOR ALL CONCEALED DAMPERS, VALVES, AND EQUIPMENT.
15. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.
16. PROVIDE CONDENSATE PUMPS THROUGHOUT CONDENSATE DRAINAGE SYSTEM AS REQUIRED TO PROPERLY REMOVE CONDENSATE. PROVIDE A PER PUMP LINE-ITEM ALLOWANCE.
17. REFRIGERANT PIPE SIZING SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. LENGTH OF PIPE, ELEVATION CHANGE AND EQUIPMENT ORIENTATION SHALL BE TAKEN INTO ACCOUNT.
18. SUCCESSFULLY PRESSURE TEST ALL REROUTED PIPING SYSTEMS. TEST SHALL BE PERFORMED AT TWICE SYSTEM OPERATING PRESSURES. REPAIR AND RETEST AS REQUIRED UNTIL SYSTEMS PROVE TIGHT.
19. ALL ROOF MOUNTED EQUIPMENT SHALL BE INSTALLED A MINIMUM OF 10' FROM THE ROOF EDGE. EQUIPMENT INSTALLED CLOSER THAN 10' SHALL REQUIRE THE INSTALLATION OF GUARD RAILS.
20. ALL CONCEALED ELECTRICAL CONNECTIONS SHALL BE HARD WIRED. PLUGS SHALL NOT BE USED AS A DISCONNECTING MEANS IN CONCEALED LOCATIONS.
21. CONTRACTOR SHALL PROVIDE ALL TEMPERATURE CONTROLS INCLUDING WIRING, TUBING, AND THERMOSTATS (WITH LOCKING COVERS) AND ALL MISCELLANEOUS APPURTENANCES TO MEET THE INTENT OF THESE DOCUMENTS.

GENERAL RENOVATION NOTES:

1. ALL SHUT DOWNS OF EXISTING SYSTEMS SHALL BE SCHEDULED AND APPROVED BY THE OWNER PRIOR TO COMMENCING WITH WORK.
2. USE OF THE OWNER'S ELEVATORS AND BUILDING CORRIDORS FOR HANDLING OF THE OWNER'S AND REMOVED EQUIPMENT AND MATERIALS SHALL BE AT THE DIRECTION OF THE OWNER AND SHALL BE COORDINATED WITH HIS OPERATIONS.
3. ALL ITEMS REMOVED SHALL BECOME PROPERTY OF THE OWNER AND SHALL BE DISPOSED OF AS PER OWNER'S INSTRUCTIONS, UNLESS INDICATED OTHERWISE. ALL ITEMS WHICH ARE NOT TO BE STORED ON SITE BY OWNERS SHALL BE REMOVED FROM THE BUILDING IMMEDIATELY.
4. DISCONNECT AND REMOVE ALL EXISTING EQUIPMENT, PIPING, DUCTWORK, FLUES, REGISTERS, SUPPORTS, HANGERS, AND ALL OTHER MECHANICAL COMPONENTS MADE OBSOLETE BY THIS PROJECT.
5. ALL NEW, RELOCATED, OR EXISTING EQUIPMENT AFFECTED BY THIS SCOPE OF WORK SHALL BE REBALANCED BEFORE BEING PLACED IN SERVICE.
6. PROVIDE ALL REQUIRED CUTTING AND PATCHING AS REQUIRED TO COMPLETE THE INSTALLATION OF NEW MECHANICAL SYSTEM. PATCH ALL SURFACES TO MATCH AND MAINTAIN ALL FIRE RATINGS.
7. EXISTING ROOF CUTTING, FLASHING, SEALING, ETC. TO BE ACCOMPLISHED BY A ROOFING CONTRACTOR APPROVED BY THE EXISTING ROOF MANUFACTURER AND INSTALLED IN ACCORDANCE WITH ROOF MANUFACTURER'S RECOMMENDATIONS SO AS NOT TO VOID ROOF WARRANTY.
8. EXISTING MATERIALS THAT ARE REMOVED SHALL NOT BE REUSED IN NEW SYSTEMS, EXCEPT WHERE INDICATED AS SUCH ON THE DRAWINGS. ALL MATERIALS AND EQUIPMENT LISTED AS NEW MUST BE NEW.
9. THE FIRE PROOFING OF THE EXISTING STRUCTURE IS NOT TO BE REMOVED FOR THE INSTALLATION OF HANGERS, SUPPORTS AND DUCTWORK ETC. IF FIRE PROOFING IS DAMAGED, IT SHALL BE REPAIRED AT THE EXPENSE OF THE TRADE.

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(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

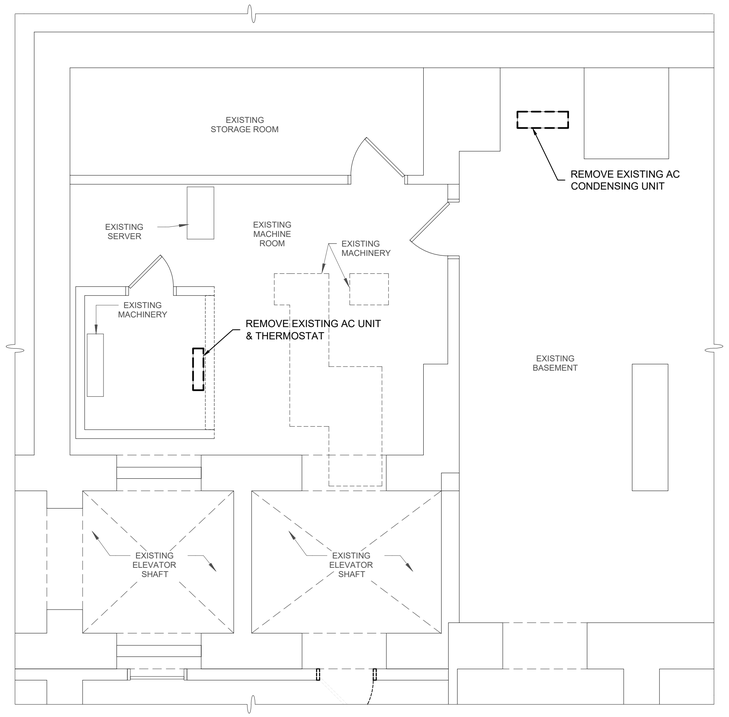
PROJECT STATUS:
ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	GRF
CHECKED BY:	WTM

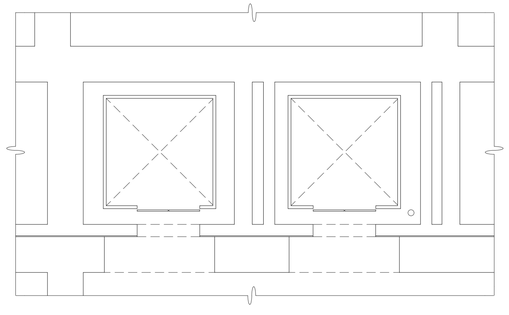
REVISIONS:

DRAWING TITLE:
MECHANICAL LEGENDS & NOTES

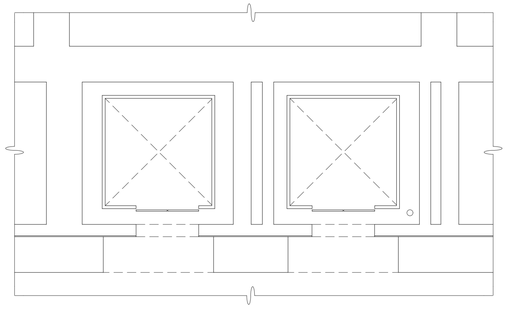
DRAWING NO.:
M0.1



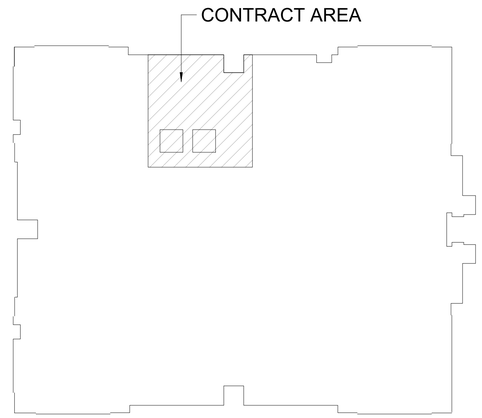
1 EXISTING/DEMO MACHINE ROOM PLAN
1/4" = 1'-0"



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



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



0' 2' 4' 8' 16'

N

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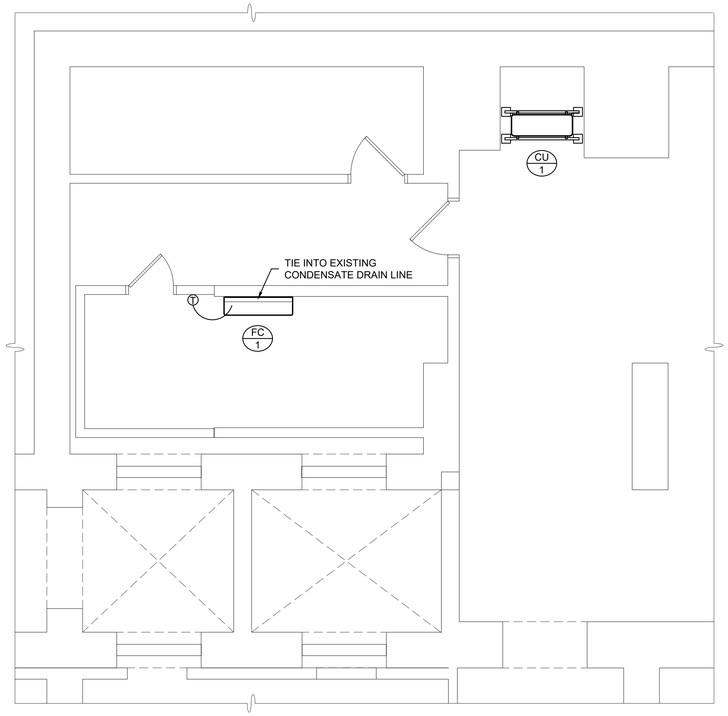
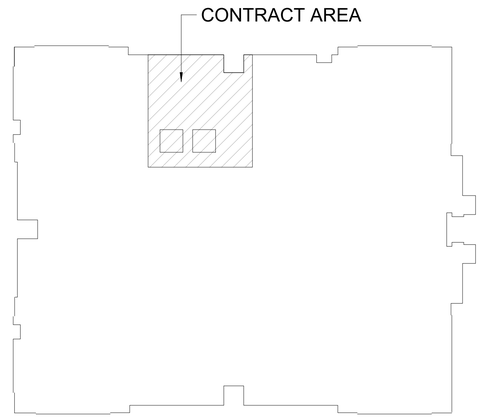
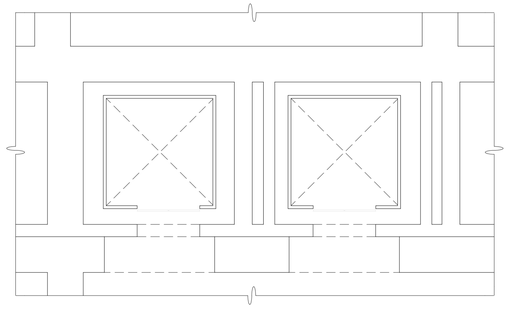
MECHANICAL EXISTING/DEMO FLOOR PLANS

DRAWING NO.:
MD1.1

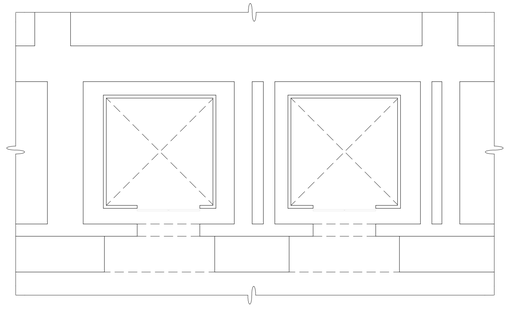


1 PROPOSED MACHINE ROOM PLAN
1/4" = 1'-0"





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



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

0' 2' 4' 8' 16'

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141 Industrial Highway Scituate, RI 02876
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DRAWING TITLE:
MECHANICAL PART PLANS

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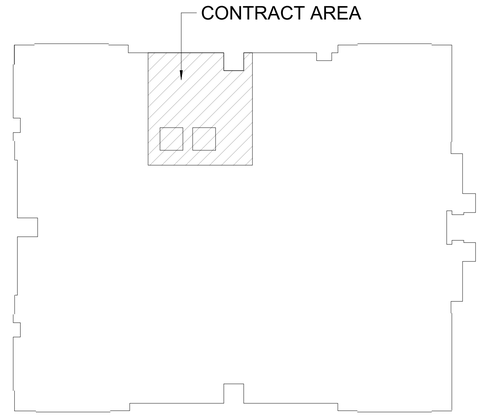
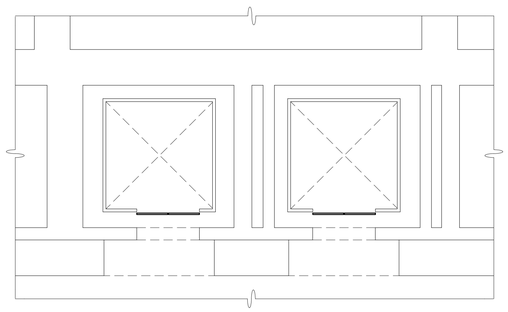
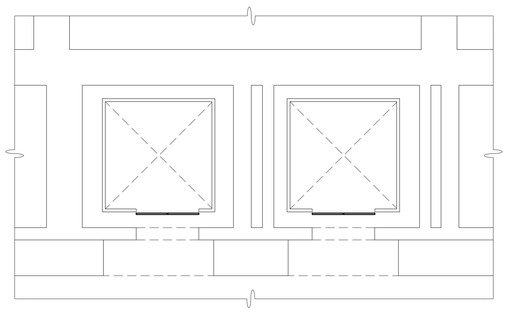
M1.1



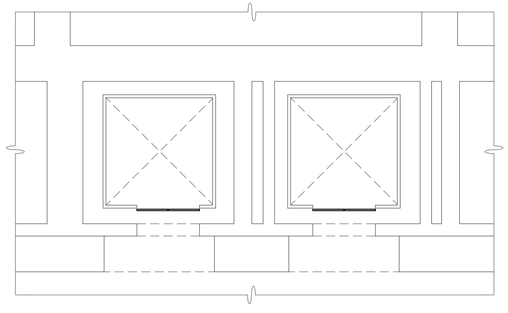


1 PROPOSED THIRD FLOOR PLAN
1/4" = 1'-0"

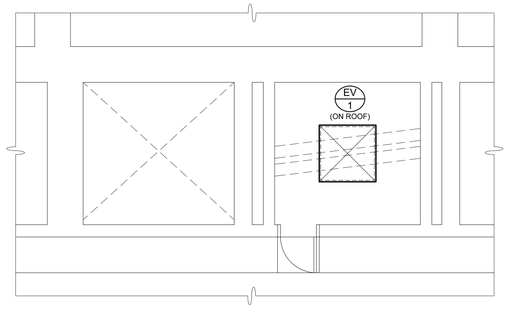


2 PROPOSED FOURTH FLOOR PLAN
1/4" = 1'-0"

MECHANICAL NOTE:
1. CONTRACTOR TO PROVIDE ADD ALT PRICING FOR ELEVATOR RELIEF VENT. ARCHITECT/CONTRACTOR TO VERIFY IF EXISTING ELEVATOR RELIEF VENT IS SUFFICIENT DURING THE DEMOLITION PHASE.



3 PROPOSED FIFTH FLOOR PLAN
1/4" = 1'-0"



4 PROPOSED ATTIC PLAN
1/4" = 1'-0"

0' 2' 4' 8' 16'

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Slatersville, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

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25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
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CHECKED BY:	WTM

REVISIONS:

DRAWING TITLE:
MECHANICAL PART PLANS

DRAWING NO.:
M1.2

FAN COIL UNIT SCHEDULE (BASED ON MITSUBISHI)

SYMBOL	MODEL	CFM	COOLING MBH	HEATING MBH	ELECTRICAL DATA					NOTES
					KW	FAN FLA	MCA	MAX. FUSE	VOLTAGE	
FC-1	PKA-A36KA8	920	36	---	-	.265	1.0	-	208V-1Ø	1,2,3

SYMBOL	MODEL	FAN FLA	COMP RLA	COMP LRA	NOMINAL MBH	ELECTRICAL DATA					NOTES
						SEER	COP	MCA	MAX. FUSE	VOLTAGE	
CU-1	PUY-A36NKA7	.5 + .5	8	13	36	19.4	---	25.0	31	208V-1Ø	1,4

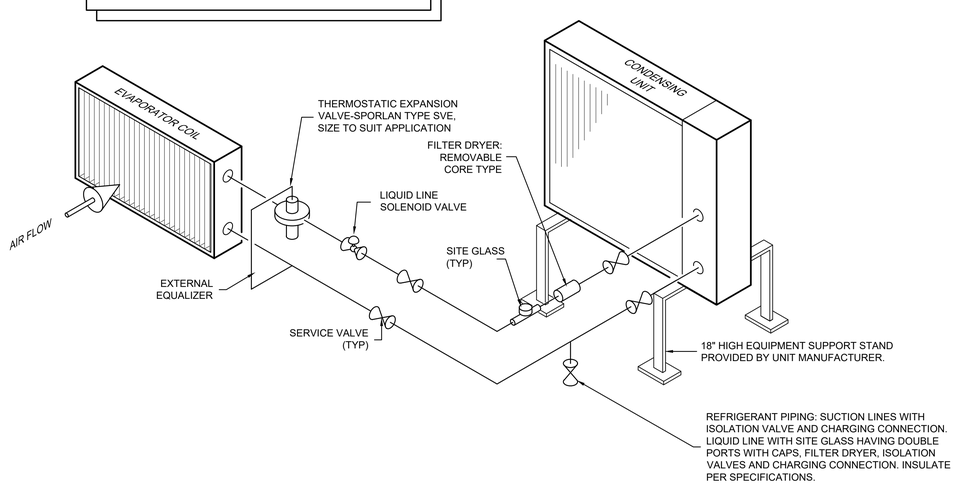
NOTES:
1. PROVIDE WITH DISCONNECT. REFER TO ELECTRICAL PLANS FOR RATINGS & COORDINATE WITH E.C.
2. PROVIDE WITH WALL CONTROLLER & FACTORY CONDENSATE PUMP. RUN 3/4" CONDENSATE TO NEAREST DRAIN
3. INDOOR UNIT IS POWERED THROUGH THE OUTDOOR UNIT. PROVIDE REFRIGERANT PIPING BETWEEN INDOOR AND OUTDOOR UNITS
4. PROVIDE FACTORY STAND

ELEVATOR VENT SCHEDULE (BASED ON GREENHECK)

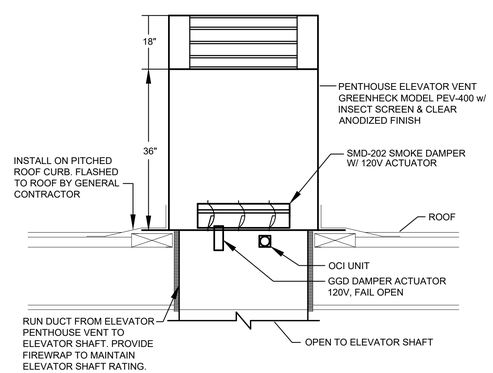
SYMBOL	MODEL	TYPE	SIZE (in x in)	LOUVER SIZE (in)	DAMPER SIZE (in)	WEIGHT (lbs.)	NOTES
EV-1	PEV-400	ROOF	38x38	30x18	26x26	495	1,2,3,4,5

NOTES:
1. PROVIDE WITH BIRD & INSECT SCREEN.
2. PROVIDE WITH ESJ-401 LOUVER.
3. PROVIDE WITH SMD-201 DAMPER/ACTUATOR (120V).
4. PROVIDE REVERSE ACTING THERMOSTAT (120V) IN HOISTWAY.
5. CONTRACTOR TO PROVIDE ADD ALT PRICING. REFER TO NOTE ON M1.2.

NOTE:
ACTUAL PIPING ACCESSORIES AND ARRANGEMENT MAY VARY ACCORDING TO MANUFACTURER AND SYSTEM TYPE. FINAL CONFIGURATION SHALL BE VERIFIED WITH MANUFACTURER INSTALLATION INSTRUCTIONS PRIOR TO BID AND INSTALLATION.



REFRIGERANT PIPING DIAGRAM
NTS



PENTHOUSE ELEVATOR VENT DETAIL
NTS

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
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DATE: 01/17/25
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DRAWING TITLE:
MECHANICAL SCHEDULES & DETAILS

DRAWING NO.:
M2.1

ABBREVIATIONS

A	AMPERES
ADA	AMERICANS WITH DISABILITIES ACT
AMPS	AMPERES
AFF	ABOVE FINISHED FLOOR
A/C	AIR CONDITIONING
AWG	AMERICAN WIRE GAGE
C	CONDUIT
C/B	CIRCUIT BREAKER
CF	COMPACT FLUORESCENT
CLG	CEILING
℄	CENTERLINE
DN	DOWN
DWG	DRAWING
E.C.	ELECTRICAL CONTRACTOR
EQ	EQUAL
ETR	EXISTING TO REMAIN
ER	EXISTING TO BE REMOVED
ERL	EXISTING TO BE RE-LOCATED
F.A.	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FLR	FLOOR
G.C.	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER.
G	GROUND
GND	GROUND
HVAC	HEATING, VENTILATING, & & AIR CONDITIONING
JB	JUNCTION BOX
KVA	KILOVOLT-AMPERES
KW	KILOWATT
LTG	LIGHTING
MAX	MAXIMUM
M.C.	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MIN	MINIMUM
MTD	MOUNTED
NAC	F.A. NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL
NEC	NATIONAL ELECTRICAL CODE
NTS	NOT TO SCALE
P	POLE
P.C.	PLUMBING CONTRACTOR
PNL	PANEL
RE	RE-LOCATED DEVICE OR EQUIPMENT SHOWN IN NEW LOCATION
TYP	TYPICAL
UL	UNDERWRITERS LABATORY
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
W	WATTS
WP	WEATHER-PROOF

(EQUIPMENT) SIZING CIRCUIT

AMP / POLE PANEL / SERVICE	POLES	TYPE (XHHW) COPPER CONDUCTORS
15A, 20A	1 (or) 2	2#12 + 1#12 GND. IN 3/4" CONDUIT
15A, 20A	3	3#12 + 1#12 GND. IN 3/4" CONDUIT
25A, 30A	1 (or) 2	2#10 + 1#10 GND. IN 3/4" CONDUIT
25A, 30A	3	3#10 + 1#10 GND. IN 3/4" CONDUIT
35A, 40A	1 (or) 2	2#8 + 1#10 GND. IN 3/4" CONDUIT
35A, 40A	3	3#8 + 1#10 GND. IN 3/4" CONDUIT
45A, 50A, 55A	1 (or) 2	2#6 + 1#10 GND. IN 3/4" CONDUIT
45A, 50A, 55A	3	3#6 + 1#10 GND. IN 3/4" CONDUIT
60A	2	2#4 + 1#10 GND. IN 1" CONDUIT
60A	3	3#4 + 1#10 GND. IN 1" CONDUIT
70A	3	3#4 + 1#8 GND. IN 1" CONDUIT
80A	3	3#3 + 1#8 GND. IN 1-1/4" CONDUIT
90A	3	3#2 + 1#8 GND. IN 1-1/4" CONDUIT
100A, 110A	3	3#1 + 1#6 GND. IN 1-1/4" CONDUIT
125A, 150A	3	3#1/0 + 1#6 GND. IN 1-1/2" CONDUIT
175A	3	3#2/0 + 1#6 GND. IN 2" CONDUIT
200A	3	3#3/0 + 1#4 GND. IN 2" CONDUIT

NOTES:

(PANEL / SWITCHBOARD / SERVICE) FEEDER SIZING

AMPERES	POLES	TYPE (XHHW) COPPER CONDUCTORS
30A	3	4#10 + 1#8 GND. IN 3/4" CONDUIT
60A	2	3#4 + 1#8 GND. IN 1" CONDUIT
60A	3	4#4 + 1#8 GND. IN 1-1/4" CONDUIT
100A	2	3#1 + 1#6 GND. IN 1-1/4" CONDUIT
100A	3	4#1 + 1#6 GND. IN 1-1/2" CONDUIT
125A, 150A	2	3#1/0 + 1#6 GND. IN 1-1/2" CONDUIT
125A, 150A	3	4#1/0 + 1#6 GND. IN 2" CONDUIT
200A	2	3#3/0 + 1#4 GND. IN 2" CONDUIT
200A	3	4#3/0 + 1#4 GND. IN 2" CONDUIT
225A	3	4#4/0 + 1#2 GND. IN 2-1/2" CONDUIT
300A	3	4#350kcmil + 1#2 GND. IN 3" CONDUIT
400A	3	4#600kcmil + 1#1/0 GND. IN 3-1/2" CONDUIT
600A	3	2 SETS OF: (4#350kcmil + 1#2 GND.) IN TWO (2) 3" CONDUITS
800A	3	2 SETS OF: (4#600kcmil + 1#1/0 GND.) IN TWO (2) 3-1/2" CONDUITS
1000A	3	3 SETS OF: (4#400kcmil + 1#1/0 GND.) IN THREE (3) 3" CONDUITS
1200A	3	3 SETS OF: (4#600kcmil + 1#1/0 GND.) IN THREE (3) 3-1/2" CONDUITS
1600A	3	4 SETS OF: (4#600kcmil + 1#1/0 GND.) IN FOUR (4) 3-1/2" CONDUITS
2000A	3	5 SETS OF: (4#600kcmil + 1#1/0 GND.) IN FIVE (5) 3-1/2" CONDUITS
2500A	3	6 SETS OF: (4#600kcmil + 1#1/0 GND.) IN SIX (6) 3-1/2" CONDUITS
3000A	3	7 SETS OF: (4#700kcmil + 1#1/0 GND.) IN SEVEN (7) 4" CONDUITS

RECEPTACLE BRANCH CIRCUIT WIRING SCHEDULE

CONDUCTOR AWG.	MAXIMUM CONDUCTOR LENGTH AT 120V	GROUND CONDUCTOR AWG.
#12	100'-0"	#12
#10	165'-0"	#10
#8	255'-0"	#10
#6	405'-0"	#10

RECEPTACLE BRANCH CIRCUIT WIRING SCHEDULE NOTES:

1. BASED ON 20A CIRCUIT LOADED TO 9A USING SINGLE PHASE, 2 WIRE CIRCUITS.
2. THE ABOVE SCHEDULE REPRESENTS MINIMUM CONDUCTOR SIZE BASED FROM PANEL TO CENTER OF LEAD TO OVERCOME VOLTAGE DROP.
3. MAKE PROVISIONS FOR JUNCTION BOX ADJACENT TO OUTLET TO TRANSITION TO #12 WIRE FOR FINAL TERMINATIONS TO DEVICE AS REQUIRED.

LUMINAIRE BRANCH CIRCUIT WIRING SCHEDULE

CONDUCTOR AWG.	MAXIMUM CONDUCTOR LENGTH AT 120V	GROUND CONDUCTOR AWG.
#12	175'-0"	#12
#10	285'-0"	#10
#8	445'-0"	#10
#6	-	#10

RECEPTACLE BRANCH CIRCUIT WIRING SCHEDULE NOTES:

1. BASED ON 20A CIRCUIT LOADED TO 9A USING SINGLE PHASE, 2 WIRE CIRCUITS.
2. THE ABOVE SCHEDULE REPRESENTS MINIMUM CONDUCTOR SIZE BASED FROM PANEL TO CENTER OF LEAD TO OVERCOME VOLTAGE DROP.
3. MAKE PROVISIONS FOR JUNCTION BOX ADJACENT TO OUTLET TO TRANSITION TO #12 WIRE FOR FINAL TERMINATIONS TO DEVICE AS REQUIRED.

WIRING DEVICE LEGEND

	DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE	18" A.F.F.
	DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	42" A.F.F. OR 6" ABOVE COUNTER
	DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE WITH GROUND FAULT PROTECTION.	18" A.F.F.
	DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE WITH GROUND FAULT PROTECTION.	42" A.F.F. OR 6" ABOVE COUNTER
	SPECIAL NEMA CONFIGUATION OUTLET; VERIFY NEMA TYPE WITH EQUIPMENT TO BE SERVED.	--
	SINGLE CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	18" A.F.F.
	DEDICATED DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	18" A.F.F.
	SWITCHED DUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE. TOP OUTLET SWITCHED, BOTTOM OUTLET UN-SWITCHED. REFER TO PLANS FOR SWITCH LOCATION(S).	18" A.F.F.
	QUADRUPLEX CONVENIENCE OUTLET; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	18" A.F.F.
	DUPLEX CONVENIENCE OUTLET IN FLOOR BOX; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	FLOOR
	DUPLEX CONVENIENCE OUTLET IN CEILING; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	CEILING
	QUAD-RUPLEX CONVENIENCE OUTLET IN FLOOR BOX; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	FLOOR
	QUAD-RUPLEX CONVENIENCE OUTLET IN CEILING; 125 VOLT, 20 AMPERE, U-SLOT GROUNDING TYPE.	CEILING
(J)	JUNCTION BOX; SIZE AS REQUIRED PER CODE.	-
(R)	RELAY; REFER TO PLANS FOR RATINGS.	-
C	CONTACTOR; REFER TO PLANS FOR RATINGS.	-
TC	TIMECLOCK; REFER TO DETAILS ON PLANS.	-
	MOTOR; REFER TO PLANS FOR DETAILS.	-
60/50	FUSED DISCONNECT SWITCH. 60/50 INDICATES FRAME SIZE/FUSE SIZE IN THAT ORDER. STARTERS FOR HVAC EQUIPMENT BY MECHANICAL CONTRACTOR.	-
	SURFACE MOUNTED PANELBOARD; 208Y/120V, 3-PHASE, 4-WIRE. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.	MOUNT 6'-6" AFF TO TOP BREAKER.
	RECESSED MOUNTED PANELBAORD; 208Y/120V, 3-PHASE, 4-WIRE. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.	MOUNT 6'-6" AFF TO TOP BREAKER.
	SURFACE MOUNTED PANELBOARD; 480Y/1277V, 3-PHASE, 4-WIRE. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.	MOUNT 6'-6" AFF TO TOP BREAKER.
	RECESSED MOUNTED PANELBAORD; 480Y/1277V, 3-PHASE, 4-WIRE. REFER TO DRAWINGS FOR ADDITIONAL INFORMATION.	MOUNT 6'-6" AFF TO TOP BREAKER.
	GROUNDING CONDUCTOR / MEANS & METHOD; IN ACCORDANCE WITH THE *"NATIONAL ELECTRIC CODE"*, (NEC). REFER TO PLANS FOR SIZING.	-

NOTES:

DEVICES WITH THE FOLLOWING SUBSCRIPTS SHALL BE PROVIDED & UL LISTED TO BE INSTALLED / WIRED AS NOTED:

H - HOSPITAL GRADE
IG - ISOLATED GROUND
T - TAMPER RESISTANT

1. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE G.C. FOR WALLS BEING FURRED-OUT WITH SHEETROCK DRYWALL SO OUTLET BOXES & DEVICES CAN BE INSTALLED FLUSH WITHIN THE WALLS. (TYPICAL)
2. ALL RECEPTACLES SHALL BE PROVIDED WITH AN ADHERED, TYPED LABEL INDICATING PANEL NAME AND CIRCUIT NUMBER. HANDWRITTEN LABELS WILL NOT BE ACCEPTED.
3. ALL RECEPTACLES WITH A DEDICATED CIRCUIT SHALL BE LABELED WITH PANEL NAME AND CIRCUIT NUMBER AS INDICATED IN NOTE #3 AS WELL AS LABELED "DEDICATED".
4. ALL COLORS OF RECEPTACLES AND ASSOCIATED FACEPLATES TO BE CONFIRMED WITH OWNER'S REPRESENTATIVE AND LOCAL (AHJ) PRIOR TO ANY SUBMITTALS, PURCHASE AND/OR INSTALLATION OF EQUIPMENT. THIS REQUIREMENT AS INDICATED IN NOTE #11 SHALL BE CORRECTED AS REQUIRED.
5. ALL TYPES AND LOCATIONS OF RECEPTACLES TO BE CONFIRMED WITH OWNER'S REPRESENTATIVE AND LOCAL (AHJ) PRIOR TO ANY SUBMITTALS, PURCHASE AND/OR INSTALLATION OF EQUIPMENT. FAILURE OF THIS REQUIREMENT AS INDICATED IN NOTE #3 SHALL BE CORRECTED AS REQUIRED.
6. ANY CONFLICT WITH RECEPTACLE LOCATIONS, TYPES OF RECEPTACLES OR COLORS OF RECEPTACLES WITH OWNER'S REPRESENTATIVE OR WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, AND GENERAL CONTRACTOR TO PROVIDE ALL ADDITIONAL WORK AND EXPENSES TO REPAIR AND CORRECT. NO ADDITIONAL REIMBURSEMENTS OR TIME OF COMPLETION FOR WORK WILL BE ALLOWED.
7. ALL RECEPTACLES LOCATED WITHIN HEATHCARE FACILITIES SHALL BE PROVIDED WITH AN ILLUMINATED FACE, OR INDICATOR LIGHT.
8. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH LOCAL (AHJ) FOR ALL INSTALLATIONS AND REQUIREMENTS.

ALL DEVICES ARE BASED ON LEGRAND.
CONTACT DEVICE REPRESENTATIVE FOR QUESTIONS OR CLARIFICATIONS SPECIFICALLY REGARDING EQUIPMENT.

TYPICAL ELECTRICAL NOTES

1. FURNISH LABOR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR THE PROPER AND COMPLETE INSTALLATION OF ALL ELECTRIC WORK SHOWN ON THE DRAWINGS AND HEREIN SPECIFIED.
2. ALL ITEMS NOT SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH ARE NECESSARY TO MAKE A COMPLETE ELECTRICAL INSTALLATION, SHALL BE FURNISHED AND INSTALLED AS PART OF THIS PROJECT.
3. ALL ELECTRICAL INSTALLATIONS AND GROUNDING SHALL BE IN STRICT ACCORDANCE WITH THE LATEST REQUIREMENTS OF THE LOCAL, STATE AND NATIONAL CODES.
4. OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS.
5. MATERIALS AND WORKMANSHIP SHALL BE THE BEST OF THEIR RESPECTIVE KIND AND IN FULL ACCORDANCE WITH THE MOST MODERN ELECTRICAL CONSTRUCTION STANDARDS. ALL MATERIAL SHALL BE NEW, UNLESS OTHERWISE NOTED AND FREE OF ANY DEFECTS.
6. THE ELECTRICAL CONTRACTOR SHALL CLEAN AT THE END OF EACH DAY ALL AREAS WORKED IN. EMPTY BOXES, RUBBISH, AND OTHER CONSTRUCTION MATERIALS OF NO USE SHALL BE REMOVED FROM THE BUILDING.
7. ALL WORK SEQUENCES SHALL BE COORDINATED WITH THE G.C. AND SHALL BE COORDINATION WITH OTHER BUILDING TRADES AND G.C. BUILDING SCHEDULES.
8. ALL BRANCH CIRCUITS RATED AT 120 VOLTS, 20 AMPERES EXCEEDING 75 FEET SHALL BE MINIMUM #10 AWG.
9. THE ELECTRICAL CONTRACTOR (E.C.) SHALL COORDINATE WITH THE LOCAL UTILITY POWER COMPANY AND PROVIDE ALL MATERIAL & LABOR REQUIRED TO COMPLY WITH THE UTILITY POWER COMPANY'S REQUIREMENTS AND STANDARDS, PRIOR TO ORDERING ANY ELECTRICAL EQUIPMENT, SUCH AS, SWITCHGEAR, PANELS, TRANSFORMERS, DISCONNECT SWITCHES, ETC... E.C. SHALL CONFIRM METERING SEQUENCE (HOT OR COLD) AND MAKE THE APPROPRIATE PROVISIONS FOR THE APPROVED METERING SEQUENCE ARRANGEMENT. A.I.C. RATINGS, GROUNDING, BONDING, RACEWAYS, ETC... SHALL BE IN ACCORDANCE WITH THE UTILITY COMPANY'S STANDARDS.
10. THE ELECTRICAL CONTRACTOR (E.C.) SHALL COORDINATE WITH THE LOCAL TELEPHONE COMPANY AND PROVIDE ALL MATERIAL & LABOR REQUIRED TO COMPLY WITH THE TELEPHONE COMPANY'S REQUIREMENTS AND STANDARDS, PRIOR TO ODERING ANY ELECTRICAL EQUIPMENT, SUCH AS, TERMINAL BOARDS, GROUNDING, RACEWAYS, ETC...
11. ALL RECEPTACLE WITH "WP" DESIGNATION SHALL BE PROVIDED WITH A WEATHER-PROOF WHILE IN-USE ENCLOSURE. (TYPICAL)
12. ELECTRICAL CONTRACTOR TO ALLOW TIME FOR DIRECTIONAL ADJUSTMENT OF ALL LIGHT FIXTURES AS DIRECTED BY OWNER.
13. ALL RECEPTACLES SHALL BE LABELED INDICATING THEIR RESPECTIVE PANEL & CIRCUIT NUMBER.
14. AT EXISTING FLOOR SLABS AND WALLS TO BE CORE-DRILLED OR CUT, THE CONTRACTOR SHALL FIND AND MARK ALL EXISTING REINFORCING, PIPING, CONDUIT & FEEDERS, ETC IN BOTH FACES LOCATED BY MEANS OF X-RAY, PACH-OMETER, OR PROFOMETER. SUBMIT DRAWING SHOWING LOCATIONS OF EXISTING REBAR, PIPING AND/OR CONDUIT AND PROPOSED CORES AND/OR CUTS FOR REVIEW.
15. ALL PENETRATIONS FOR POWER RECEPTACLES, JUNCTION BOXES, TELEPHONE/DATA OUTLETS, SWITCHES, BACKBOXES, ETC.. LOCATED IN EXTERIOR WALLS SHALL BE PROVIDED WITH APPROPRIATE CAULKING AND GASKETS TO SEAL OFF AND PREVENT AIR LEAKAGE. FOLLOW CAULKING AND GASKET MANUFACTURERS INSTALLATION GUIDELINES TO ENSURE CORRECT AND EFFECTIVE INSTALLATION.

TELEPHONE & DATA RACEWAY NOTES

1. NO SECTION OF CONDUIT SHALL BE LONGER THAN 100-FEET BETWEEN PULL POINTS.
2. NO SECTION OF CONDUIT SHALL CONTAIN MORE THAN TWO 90-DEGREE BENDS, OR EQUIVALENT, BETWEEN PULL POINTS (e.g., OUTLET BOXES, TELECOMMUNICATIONS CLOSETS, OR PULL BOXES). IF THERE IS A REVERSE (U-SHAPED) BEND IN THE SECTION, A PULL BOX SHALL BE INSTALLED.
3. THE INSIDE RADIUS OF A BEND IN CONDUIT SHALL BE AT LEAST 6 TIMES THE INTERNAL DIAMETER. BENDS IN THE CONDUIT SHALL NOT CONTAIN ANY KINKS OR OTHER DISCONTINUITIES THAT MAY HAVE A DETRIMENTAL EFFECT ON THE CABLE SHEATH DURING CABLE PULLING OPERATIONS.
4. ANY SINGLE CONDUIT RUN EXTENDING FROM A TELECOMMUNICATIONS CLOSET SHALL NOT SERVE MORE THAN THREE OUTLET BOXES.
5. CONDUITS PROTRUDING / PENETRATING THROUGH THE FLOOR IN THE TELECOMMUNICATIONS CLOSETS SHALL BE TERMINATED 3-INCHES ABOVE THE FLOOR ADJACENT WALLS. PROTRUSIONS / PENETRATIONS SHALL BE LOCATED TO AVOID CREATING A TRIPPING HAZARD WITHIN THE CLOSETS. FIRESTOP ALL PROTRUSIONS / PENETRATIONS.
6. A MINIMUM 3/4-INCH CONDUIT SHALL BE PROVIDED FROM THE TELECOMMUNICATIONS CLOSET TO SERVE EACH WALL-MOUNTED PUBLIC TELEPHONE. IN DISCUSSION WITH THE TELEPHONE PROVIDER, AND WHERE IT IS DESIRABLE TO CONCEAL THE OUTLET BOX DIRECTLY BEHIND THE TELEPHONE, THE CENTER OF THE OUTLET BOX SHALL BE LOCATED 48-INCHES ABOVE THE FINISHED FLOOR. FOR RECESSED APPLICATIONS, THE CONDUIT AND BOX SHALL BE INSTALLED TO SUIT THE SPECIFIC TYPE OF MOUNTING. REFER TO APPLICABLE CODES, ADA GUIDELINES, UNIFORM FEDERAL ACCESSIBILITY STANDARDS, MANUFACTURES SPECIFICATIONS AND ANSI STANDARDS FOR ADDITIONAL REQUIREMENTS.
7. WHERE A TELECOMMUNICATIONS CONDUIT IS TO BE INSTALLED TO A DEVICE EXPOSED TO THE WEATHER, CARE SHALL BE TAKEN TO PREVENT THE INGRESS OF MOISTURE. CARE SHALL ALSO BE TAKEN TO ENSURE THAT MOISTURE WILL NOT COLLECT IN LOW POINTS, FREEZE AND DAMAGE THE CABLE. NONMETALLIC CONDUIT SHALL BE UV RESISTANT AND MARKED ACCORDINGLY.
8. CONDUITS SHALL BE REAMED TO ELIMINATE SHARP EDGES. METALLIC CONDUIT SHALL BE TERMINATED WITH AN INSULATED BUSHING.
9. REFER TO ANSI/TIA/EIA-606 FOR ADMINISTRATION OF THE CONDUIT SYSTEM IDENTIFICATION.
10. ALL CONDUITS SHALL BE PROVIDED WITH PULL STRINGS.
11. OUTLET BOXES SHALL BE NO SMALLER THAN 2-INCHES WIDE, 3-INCHES HIGH AND 2.5-INCHES DEEP. THIS WILL ACCOMODATE ONE OR TWO 3/4-INCH CONDUITS. WHERE A LARGER CONDUIT IS REQUIRED, THE BOX SHALL BE INCREASED ACCORDINGLY. A MAXIMUM 1-1/4-INCH CONDUIT WILL REQUIRE A 4-11/16-INCH x 4-11/16-INCH x 2-1/2-INCH BOX.
12. CONDUIT TYPES SHALL BE ELECTRICAL METALLIC TUBING (EMT) OR RIGID METAL CONDUIT. LOCATIONS SUBJECT TO MOISTURE SHALL BE RIGID PVC. FLEXIBLE CONDUIT SHALL NOT BE USED FOR TELE/DATA RACEWAYS.
13. CONDUIT REQUIREMENTS FOR SUPPORT, END PROTECTION AND CONTINUITY SHALL COMPLY WITH APPROPRIATE ELECTRICAL CODES.
14. CONDUIT AND BOXES FOR TELE/DATA WIRING SHALL BE DEDICATED TO THOSE SYSTEMS. POWER WIRING SHALL BE KEPT OUT OF CONDUIT AND BOXES DEDICATED TO TELE/DATA WIRING.
15. CONDUIT SIZE FOR MAXIMUM NUMBER OF CABLES (SEE TABLE BELOW):

Conduit Trade Size	Maximum number of cables based upon allowable fill									
	Cable Outside Diameter in Inches									
	0.13	0.18	0.22	0.24	0.29	0.31	0.37	0.53	0.62	0.70
1/2"	1	1	0	0	0	0	0	0	0	0
3/4"	6	5	4	3	2	2	1	0	0	0
1"	8	8	7	6	3	3	2	1	0	0
1-1/4"	16	14	12	10	6	4	3	1	1	1
1-1/2"	20	18	16	15	7	6	4	2	1	1
2"	30	26	22	20	14	12	7	4	3	2
2-1/2"	45	40	36	30	17	14	12	6	3	3
3"	70	60	50	40	20	20	17	7	6	6
3-1/2"	-	-	-	-	-	-	22	12	7	6
4"	-	-	-	-	-	-	30	14	12	7

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	RD

REVISIONS:

DRAWING TITLE:

ELECTRICAL LEGENDS & NOTES

DRAWING NO.:

E0.1

TYPICAL DEMOLITION NOTES:

1. PRIOR TO SUBMITTING BID, VISIT SITE AND IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK OF THIS SECTION. RENOVATION WORK WILL REQUIRE CAREFUL SITE EXAMINATION PRIOR TO BIDDING. NO COMPENSATION WILL BE GRANTED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY CONSTRUED BY AN EXPERIENCED OBSERVER. FIELD VERIFY MEASUREMENTS AND CIRCUITING ARRANGEMENTS THAT ARE AS SHOWN ON DRAWINGS. THE ELECTRICAL CONTRACTOR SHALL REVIEW ALL OF THE ARCHITECTS AND OTHER TRADES DRAWINGS TO VERIFY ALL AREAS OF RENOVATION AND TO GET A COMPLETE UNDERSTANDING OF THE DEMOLITION WORK REQUIRED BY THIS PROJECT.

2. FIELD VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.

3. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION AND EXISTING RECORD DOCUMENTS. REPORT DISCREPANCIES TO ARCHITECT/ENGINEER BEFORE DISTURBING EXISTING INSTALLATIONS. THESE DRAWINGS HAVE BEEN COMPILED FROM THE BEST AVAILABLE INFORMATION AND ARE NOT INTENDED TO LIMIT THE SCOPE OF THE WORK. THE ELECTRICAL CONTRACTOR MAY ENCOUNTER HIDDEN OR COVERED CONDITIONS, NOT INDICATED IN THESE DOCUMENTS, REQUIRING THE ELECTRICAL CONTRACTOR TO PROVIDE ADDITIONAL WORK FOR THE COMPLETION OF HIS OR HER CONTRACT. IT WILL BE ASSUMED THAT THE CONTRACTOR HAS INSPECTED THE SITE PRIOR TO BIDDING AND VERIFIED THE INFORMATION SUPPLIED HEREIN AND ADDITIONAL WORK REQUIRED. BEGINNING OF DEMOLITION MEANS THE CONTRACTOR ACCEPTS EXISTING CONDITIONS. REFER TO ALL CONSTRUCTION DOCUMENTS TO GAIN A COMPLETE UNDERSTANDING OF THE DEMOLITION WORK REQUIRED.

4. CUT, REMOVE AND LEGALLY DISPOSE OF SELECTED ELECTRICAL EQUIPMENT, COMPONENTS AND MATERIALS AS INDICATED, INCLUDING, BUT NOT LIMITED TO, REMOVAL OF ELECTRICAL ITEMS INDICATED TO BE REMOVED AND ITEMS MADE OBSOLETE BY THE WORK. DISCONNECT AND REMOVE ALL FIXTURES, WIRING DEVICES, CONDUIT AND FITTINGS, WIRING & CABLE, FIRE ALARM DEVICES/COMPONENTS, HANGERS, SUPPORTS, WIREWAYS, AND ALL OTHER ELECTRICAL COMPONENTS MADE OBSOLETE BY THIS PROJECT. THE OWNER RESERVES THE OPTION OF SALVAGE RIGHTS TO DEMOLISHED MATERIAL AND REMOVED EQUIPMENT. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE TO OBTAIN A LIST OF MATERIALS AND REMOVED EQUIPMENT TO BE TURNED OVER TO THE OWNER. ALL OTHER MATERIAL AND REMOVED EQUIPMENT NOT BEING SALVAGED BY THE OWNER SHALL BE DISPOSED OF BY THE CONTRACTOR. PLACE ALL DEMOLISHED ELECTRICAL MATERIALS EXCEPT HAZARDOUS MATERIALS (PCB LIGHTING BALLASTS, FLUORESCENT LAMPS, ETC.) AS DETERMINED BY THE AUTHORITY HAVING JURISDICTION IN GENERAL CONTRACTOR'S DUMPSTER. ALL HAZARDOUS ELECTRICAL MATERIALS SHALL BE LEGALLY DISPOSED OF BY THE ELECTRICAL SUBCONTRACTOR.

5. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.

6. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANELS AS APPROPRIATE. TEMPORARY WALL OPENINGS AND/OR MODIFICATIONS REQUIRED FOR REMOVAL/INSTALLATION OF EQUIPMENT SHALL BE PROVIDED AS NEEDED AND COORDINATED WITH THE GENERAL CONTRACTOR. ALL HVAC UNITS SCHEDULED TO BE REMOVED OR RE-LOCATED SHALL BE DONE SO BY THE HVAC CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL DISCONNECT AND MAKE-SAFE FOR REMOVAL.

7. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.

8. EXISTING ELECTRICAL SERVICE: MAINTAIN EXISTING SYSTEM IN SERVICE. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER AND ARCHITECT/ENGINEER AT LEAST 72 HOURS BEFORE PARTIALLY OR COMPLETELY DISABLING SYSTEM. MINIMIZE OUTAGE DURATION. MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO WORK AREA AS REQUIRED.

9. EXISTING FIRE ALARM SYSTEM: MAINTAIN THE EXISTING SYSTEM IN SERVICE UNTIL THE NEW SYSTEM IS TESTED AND ACCEPTED BY THE FIRE DEPARTMENT. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. NOTIFY OWNER, ARCHITECT/ENGINEER AND LOCAL FIRE DEPARTMENT AT LEAST TEN DAYS BEFORE PARTIALLY OR COMPLETELY DISABLING SYSTEM. MINIMIZE OUTAGE DURATION. MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO WORK AREA AS REQUIRED OR PROVIDE A "FIRE-WATCH" SYSTEM COORDINATED WITH THE LOCAL FIRE DEPARTMENT.

10. EXISTING TELEPHONE SYSTEM: MAINTAIN EXISTING SYSTEM IN SERVICE. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. NOTIFY OWNER, ARCHITECT/ENGINEER AND TELEPHONE UTILITY COMPANY AT LEAST 72 HOURS BEFORE PARTIALLY OR COMPLETELY DISABLING SYSTEM. MINIMIZE OUTAGE DURATION. MAKE TEMPORARY CONNECTIONS TO MAINTAIN SERVICE IN AREAS ADJACENT TO WORK AREA.

11. EXTEND EXISTING ELECTRICAL INSTALLATIONS AS CALLED FOR ON THE DRAWINGS.

12. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.

13. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY.

14. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES.

15. DISCONNECT ABANDONED OUTLETS AND REMOVE DEVICES. REMOVE ABANDONED OUTLETS IF CONDUIT SERVICING THEM IS ABANDONED AND REMOVED. PROVIDE BLANK COVER FOR ABANDONED OUTLETS WHICH ARE NOT REMOVED.

16. DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT.

17. DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT SERVING UTILIZATION EQUIPMENT THAT HAS BEEN REMOVED.

18. DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES.

19. DISCONNECT AND REMOVE OTHER SYSTEMS AND EQUIPMENT WITHIN THE WORK AREA MADE OBSOLETE BY THIS WORK.

20. PROTECT ALL EXISTING WALLS, FLOORS, CEILINGS, LIGHT FIXTURES, WIRING, DEVICES, SYSTEMS, ETC. WHICH ARE TO REMAIN & TO PREVENT DAMAGE AND/OR POWER OUTAGES DURING ALL CONSTRUCTION PHASES. REPAIR ADJACENT EXISTING ELECTRICAL INSTALLATIONS, CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO PREVENT THE SPREAD OF DUST AND DIRT TO ADJACENT AREAS. PROTECT THE STRUCTURE, FURNISHINGS, FINISHES, AND ADJACENT MATERIALS NOT INDICATED OR SCHEDULED TO BE REMOVED. PROTECT THE ELECTRICAL WORK AND THE WORK OF OTHERS IN A MANNER BEST SUITED TO THE PARTICULAR CASE. CORRECT ANY DAMAGE DONE TO ANY EXISTING INSTALLATIONS OR NEW WORK AT NO ADDITIONAL COST TO THE OWNER.

21. THE DEMOLITION, REDISTRIBUTION AND REPAIR WORK SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR BASED ON THE APPROACH IN WHICH THE ELECTRICAL CONTRACTOR PROVIDES THE INVESTIGATION & TRACING OF CIRCUITS NEEDED TO SATISFY PERFORMANCE CRITERIA OUTLINED IN THESE TYPICAL DEMOLITION NOTES AND OTHER REQUIREMENTS LISTED HEREIN.

22. WHERE ANY EXISTING BRANCH CIRCUITS ARE CURRENTLY SERVING DEVICES, FIXTURES OR EQUIPMENT IN BOTH DEMOLITION SPACES AND NON-DEMOLITION SPACES, THOSE CIRCUITS SHALL BE SEPARATED AND RE-CONNECTED SUCH THAT THE EXISTING TO REMAIN DEVICES, FIXTURES OR EQUIPMENT WILL RETAIN POWER AS NECESSARY. THE E.C. SHALL BE RESPONSIBLE FOR TRACING BRANCH CIRCUITRY AND DETERMINING EXTENT OF WORK. THE E.C. SHALL PROVIDE NEW BRANCH CIRCUITRY AS REQUIRED TO EXTEND EXISTING BRANCH CIRCUITS TO CORRESPONDING CIRCUIT BREAKERS THAT ARISE FROM THE REDISTRIBUTION OF CIRCUITS DESCRIBED ABOVE.

23. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.

24. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS, OR AS SPECIFIED.

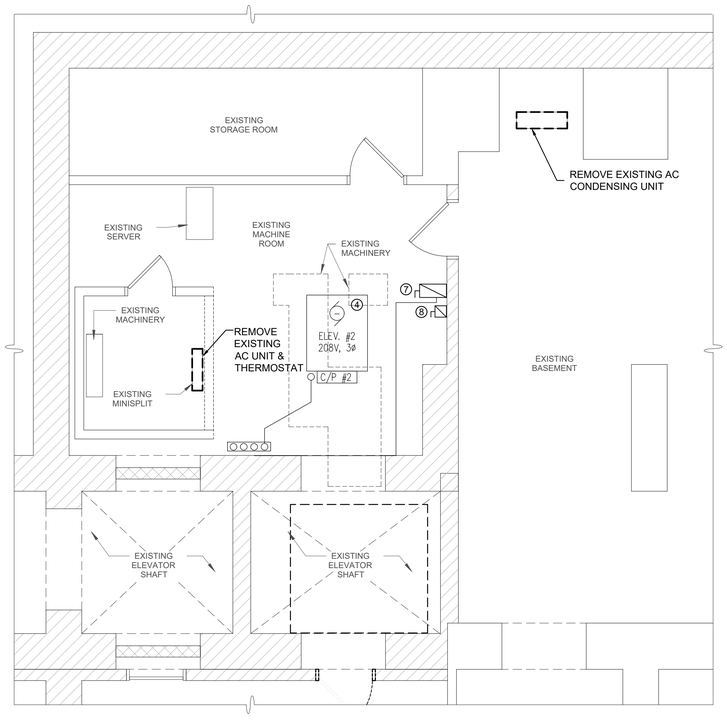
25. CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED.

26. EXISTING PANELBOARDS: CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ELECTRICAL ALL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AND PROVIDE CLOSURE PLATES FOR VACANT POSITIONS. PROVIDE TYPED CIRCUIT DIRECTORY SHOWING REVISED CIRCUITING ARRANGEMENT. CIRCUIT BREAKERS LEFT UN-USED AFTER CONSTRUCTION IS COMPLETED SHALL BE TURNED IN THE OFF POSITION AND RECORDED AS "SPARE" IN CIRCUIT BREAKER DIRECTORY.

"EXISTING" ELEV. MACH. RM. NOTES

1. EXISTING FEEDERS FROM EXISTING ELEVATOR POWER BREAKER TO NEW ELEVATOR CONTROLLER TO BE REPLACED WITH NEW.
2. EXISTING FEEDERS FROM EXISTING CAB LIGHTING BREAKER TO NEW ELEVATOR CONTROLLER TO BE REPLACED WITH NEW.
3. CONTRACTOR SHALL REMOVE ALL EXISTING LINE VOLTAGE POWER WIRING FROM EXISTING ELEVATOR CONTROLLER. COORDINATE SCOPE OF WORK & TIME OF WORK WITH ELEVATOR MANUFACTURER / CONTRACTOR.

   CONTRACTOR SHALL CARRY AN ALLOWANCE TO PROVIDE & INSTALL NEW TELEPHONE LINES FROM MAIN BUILDING TELEPHONE TERMINAL POINT TO EACH ELEVATOR CONTROLLER. THIS ALLOWANCE WILL BE ISSUED AS A CREDIT TO OWNER IF EXISTING TELEPHONE LINES ARE FOUND, TESTED AND AVAILABLE FOR RE-USE UPON COMPLETION OF DEMOLITION PROCESS.
4. CONTRACTOR SHALL REMOVE ALL EXISTING LINE VOLTAGE POWER WIRING FROM EXISTING ELEVATOR MOTOR / PUMP. COORDINATE SCOPE OF WORK & TIME OF WORK WITH ELEVATOR MANUFACTURER / CONTRACTOR.
5. CONTRACTOR SHALL CARRY AN ALLOWANCE TO PROVIDE & INSTALL NEW FIRE ALARM SYSTEM CONTROL MODULES FOR EACH ELEVATOR FOR ("RECALL FLOOR #1", "ALT. FLOOR RECALL" & "FIREFIGHTERS HAT") WITH FIRE ALARM SYSTEM WIRING, INTEGRATION AND PROGRAMMING INTO THE BASE BUILDING FIRE ALARM SYSTEM. THIS ALLOWANCE WILL BE ISSUED AS A CREDIT TO OWNER IF EXISTING FIRE ALARM SYSTEM CONTROL MODULES ARE FOUND, TESTED AND AVAILABLE FOR RE-USE UPON COMPLETION OF DEMOLITION PROCESS.
6. EXISTING ELEVATOR POWER PANEL & ASSOCIATED BREAKER'S TO REMAIN AND BE RE-USED. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THESE MEET THE ELEVATOR MANUFACTURER'S REQUIREMENTS AS WELL AS THE ELEVATOR INSPECTORS MOUNTING & LOCATION REQUIREMENTS.
7. EXISTING ELEVATOR CAB LIGHTING ASSOCIATED BREAKER'S TO REMAIN AND BE RE-USED. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THESE MEET THE ELEVATOR MANUFACTURER'S REQUIREMENTS AS WELL AS THE ELEVATOR INSPECTORS MOUNTING & LOCATION REQUIREMENTS.
8. CONTRACTOR SHALL REMOVE EXISTING FEEDER DURING THE DEMOLITION PROCESS.



1 EXISTING/DEMO MACHINE ROOM PLAN
1/4" = 1'-0"

0' 2' 4' 8' 16'

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	RD

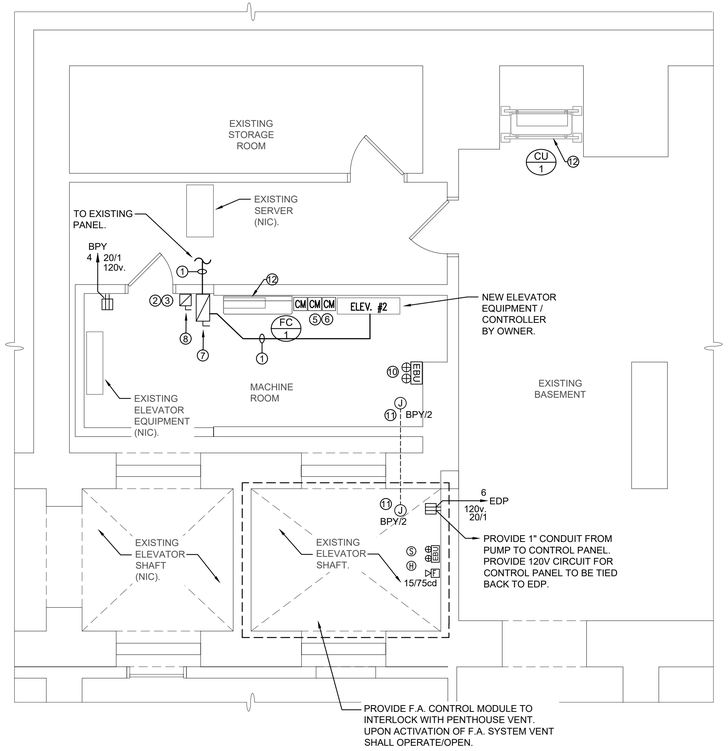
REVISIONS:

DRAWING TITLE:
ELECTRICAL EXISTING/DEMO FLOOR PLANS

DRAWING NO.:
ED1.1

"NEW WORK" ELEV. MACH. RM. NOTES

1. PROVIDE NEW POWER FEEDERS FROM EXISTING ELEVATOR PANEL. VERIFY EXACT LOCATION OF EXISTING PANEL WITH OWNER'S REPRESENTATIVE PRIOR TO BID. FEEDERS SHALL BE EXTENDED TO NEW ELEVATOR DISCONNECT SWITCH & ONTO NEW ELEVATOR CONTROLLER. PROVIDE FEEDER CONSISTING OF: 3#1/0+1#6GND. IN 1-1/2" C. ANY NEW MATERIALS REQUIRED TO EXTEND FEEDER SHALL MATCH EXISTING ELECTRICAL CHARACTERISTICS. FEEDER ROUTING, LOCATION AND TIE-IN TO BE FIELD VERIFIED.
2. PROVIDE AND INSTALL NEW FEEDERS FROM EXISTING CAB LIGHTING BREAKER'S TO NEW ELEVATOR CAB LIGHTING DISCONNECT SWITCH & ONTO NEW ELEVATOR CONTROLLER, CONSISTING OF: 2#12 + 1#12 GND. IN 3/4" CONDUIT. FEEDER ROUTING, LOCATION AND TIE-IN TO BE FIELD VERIFIED. RE-USE EXISTING CAB LIGHT CIRCUIT FED FROM LOCAL AREA PANEL.
3. PROVIDE AND INSTALL A NEW #6 AWG COPPER GROUND WIRE NEW ELEVATOR CONTROLLER TO EXISTING BUILDING GROUND. FEEDER ROUTING, LOCATION AND TIE-IN TO BE FIELD VERIFIED.
4. (NOT USED)
5. CONTRACTOR SHALL CARRY AN ALLOWANCE TO PROVIDE & INSTALL NEW TELEPHONE LINES FROM MAIN BUILDING TELEPHONE TERMINAL POINT TO EACH ELEVATOR CONTROLLER. THIS ALLOWANCE WILL BE ISSUED AS A CREDIT TO OWNER IF EXISTING TELEPHONE LINES ARE FOUND, TESTED AND AVAILABLE FOR RE-USE UPON COMPLETION OF DEMOLITION PROCESS.
6. CONTRACTOR SHALL CARRY AN ALLOWANCE TO PROVIDE & INSTALL NEW FIRE ALARM SYSTEM CONTROL MODULES FOR EACH ELEVATOR FOR ("RECALL FLOOR #1", "ALT. FLOOR RECALL" & "FIREFIGHTERS HAT") WITH FIRE ALARM SYSTEM WIRING, INTEGRATION AND PROGRAMMING INTO THE BASE BUILDING FIRE ALARM SYSTEM. THIS ALLOWANCE WILL BE ISSUED AS A CREDIT TO OWNER IF EXISTING FIRE ALARM SYSTEM CONTROL MODULES ARE FOUND, TESTED AND AVAILABLE FOR RE-USE UPON COMPLETION OF DEMOLITION PROCESS.
7. PROVIDE & INSTALL NEW HEAVY-DUTY 200AMP / 3-POLE ELEVATOR POWER DISCONNECT SWITCH WITH 125 AMP DUAL ELEMENT, TIME-DELAY FUSING. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THESE SWITCHES MEET THE ELEVATOR MANUFACTURER'S REQUIREMENTS AS WELL AS THE ELEVATOR INSPECTORS MOUNTING & LOCATION REQUIREMENTS.
8. PROVIDE & INSTALL NEW ELEVATOR CAB LIGHTING DISCONNECT SWITCHES AT DOOR. CONTRACTOR SHALL RUN NEW CAB LIGHTING CIRCUITRY AS NOTED IN ITEM #2 ABOVE THROUGH NEW DISCONNECT SWITCH. IT SHALL BE THIS CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THESE SWITCHES MEET THE ELEVATOR MANUFACTURER'S REQUIREMENTS AS WELL AS THE ELEVATOR INSPECTORS MOUNTING & LOCATION REQUIREMENTS.
9. (NOT USED)
10. PROVIDE & INSTALL A SELF-CONTAINED EMERGENCY BATTERY UNIT WITH INTEGRAL LIGHTING HEADS & BATTERIES, TIED INTO ROOMS LIGHTING FIXTURE CIRCUIT, AHEAD OF ANY / ALL SWITCHING.
11. PROVIDE JUNCTION BOX & 120 VOLT CIRCUIT AS INDICATED WITH WIRING CONSISTING OF: 2#12 + 1#12G. IN 3/4" CONDUIT FOR SUMP PUMP & FLOAT SWITCH. PROVIDE 3/4" CONDUIT FROM SUMP PUMP TO HIGH WATER ALARM OUTSIDE ELEVATOR SHAFT. COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATIONS OF ALL EQUIPMENT AS WELL AS EXACT WIRING & CONTROL EQUIPMENT. THIS CONTRACTOR (E.C.) SHALL BE RESPONSIBLE TO PROVIDE ALL WIRING, CIRCUITRY & INSTALLATION REQUIRED TO ENERGIZE AND CONTROL THIS SUMP PUMP SYSTEM. SUMP PUMPS SHALL BE FED FROM LOCAL AREA PANEL "BPY" CIRCUIT #1. E.C. SHALL COORDINATE LOAD ON THE PANEL PRIOR TO ANY INSTALLATION.
12. DISCONNECT POWER FOR RELOCATION. EXPAND CIRCUIT TO NEW LOCATION AS REQUIRED. VERIFY WITH M.C.

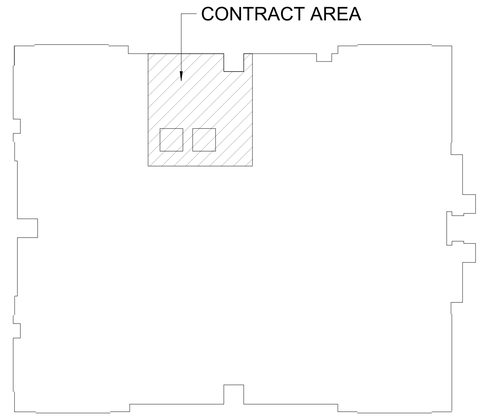


1 PROPOSED MACHINE ROOM PLAN
1/4" = 1'-0"

MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE

XXX / ## ITEM No.	DESCRIPTION	LOCATION	EQUIPMENT CHARACTERISTICS					CIRCUIT	CIRCUIT BREAKER (HACR TYPE)	FEEDER & CONDUIT	DISCONNECT SWITCH				MANUAL MOTOR CONTROLLER	REMARKS
			VOLTS	PH	FREQ.	(KW)/HP	FLA				SIZE	FUSE	POLES	NEMA		
EV-1	ELEVATOR VENT	(SEE PLANS)	120	1	60	-	-	BPY/2	15A/1P	3#12 + 1#12 GND. IN 3/4" C.	-	-	-	-	PROVIDE MOTOR RATED TOGGLE SWITCH WITH THERMAL OVERRIDES.	SEE BELOW
FC-1	FAN COIL UNIT	(SEE PLANS)	208	1	60	-	1.0	EXIST.	30A/2P	2#10 + 1#10 GND. IN 3/4" C.	-	-	-	-	PROVIDE MOTOR RATED TOGGLE SWITCH WITH THERMAL OVERRIDES.	INDOOR UNIT IS POWERED THROUGH THE OUTDOOR UNIT. IT SHALL BE E.C.'S RESPONSIBILITY TO VERIFY PANEL, BREAKER AND LOAD IN FIELD.
CU-1	CONDENSING UNIT	(SEE PLANS)	208	1	60	-	25.0				30	30	2	3R	PROVIDE "WP" MOTOR RATED TOGGLE SWITCH WITH THERMAL OVERRIDES.	

NOTES:
1. COORDINATE WITH HVAC CONTRACTOR & DRAWINGS FOR EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT PRIOR TO INSTALLING ELECTRICAL COMPONENTS.
2. COORDINATE WITH PLUMBING CONTRACTOR & DRAWINGS FOR EXACT LOCATIONS OF ALL PLUMBING EQUIPMENT PRIOR TO INSTALLING ELECTRICAL COMPONENTS.
3. ALL DISCONNECTING MEANS SHALL BE SUPPLIED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
4. ALL STARTERS, VFD'S ETC. SHALL BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL WIRE ALL HVAC EQUIPMENT.
5. ALL HVAC CONTROL WIRING SHALL BE PROVIDED BY OTHERS.
6. CONTRACTOR TO PROVIDE ADD ALT PRICING. PREFER TO NOTE ON E1.2.



ELEVATOR GENERAL NOTES

1. FUSED DISCONNECT SWITCH WITH 120 VOLT CIRCUIT FOR CAB LIGHTS, FUSE SHALL BE 15 AMP. CONNECT CAB LIGHTING TO THE LINE SIDE OF THE MACHINE ROOM GFCI RECEPTACLE.
2. PROVIDE (1) JUNCTION BOX IN ELEVATOR MACHINE ROOM WITH 3/4" EMT CONDUIT TO TELEPHONE BACKBOARD FOR EACH ELEVATOR FOR CAB TELEPHONE. CONDUITS SHALL INCLUDE PULL STRING.
3. PROVIDE (1) JUNCTION BOX IN ELEVATOR MACHINE ROOM WITH 3/4" EMT CONDUIT & (4) #14 AWG FOR EACH ELEVATOR TO FIRE ALARM CONTROL PANEL FOR ELEVATOR CAPTURE.
4. PROVIDE 120 VOLT., 20 AMP CIRCUIT TO ELEVATOR CONTROLLER.
5. PROVIDE 120 VOLT., 20 AMP CIRCUIT FOR OIL HEATER.
6. PROVIDE (1) JUNCTION BOX WITH 3/4"C. TO TELEPHONE TERMINAL BOARD FOR EACH ELEVATOR FOR OFF SITE TELEPHONE MONITORING.
7. PROVIDE (1) JUNCTION BOX WITH 3/4"C. TO TELEPHONE TERMINAL BOARD FOR EACH ELEVATOR FOR INTERCOM.
8. ALL ELECTRICAL EQUIPMENT, DEVICES, WIRING, RACEWAYS, JUNCTION BOXES, ETC.. FOREIGN TO THE ELEVATOR SHALL NOT BE INSTALLED IN THE ELEVATOR MACHINE ROOM OR HOISTWAY. (TYPICAL)
9. IN HOISTWAYS, ALL ELECTRICAL EQUIPMENT LOCATED LESS THAN 48-INCHES ABOVE THE PIT FLOOR SHALL BE WEATHERPROOF (NEMA 4); AND WIRING SHALL BE IDENTIFIED FOR USE IN WET LOCATIONS IN ACCORDANCE WITH THE REQUIREMENTS IN NFPA 70. (TYPICAL)
10. LIGHTING IN HOISTWAYS SHALL NOT BE CONNECTED TO THE LOAD SIDE OF THE GFCI RECEPTACLE. LOCATE LIGHT FIXTURE TO AVOID BEING STRUCK BY THE ELEVATOR CAR OR COUNTER-WEIGHT. THE SWITCH SHALL BE LOCATED SO AS TO BE READILY ACCESSIBLE FROM THE PIT DOOR.
11. PROVIDE FIRE ALARM SYSTEM CONNECTIONS FOR ELEVATOR CAB "FIRE-FIGHTERS HAT" INDICATOR AS REQUIRED. COORDINATE CONNECTION REQUIREMENTS WITH ELEVATOR AND FIRE ALARM SYSTEM MANUFACTURERS AS REQUIRED.
12. PROVIDE CONTROL MODULES THAT SHALL CAPTURE THE ELEVATOR WHEN THE FIRE ALARM SYSTEM IS ACTIVATED AND THEREFORE BRING THE ELEVATOR CAB TO A PRE-DETERMINED FLOOR & ALTERNATE FLOOR AS REQUIRED. COORDINATE WITH ELEVATOR MANUFACTURER & INSTALLER FOR CONNECTIONS AND PROGRAMMING. COORDINATE WITH FIRE DEPARTMENT & ARCHITECT FOR PRE-DETERMINED FLOOR AND ALTERNATE FLOOR.
13. ELEVATOR SHALL BE PROVIDED WITH A 208V INPUT / 208V OUTPUT ISOLATION TRANSFORMER FOR THE PURPOSES OF REDUCING THE AVAILABLE FAULT CURRENT AHEAD OF THE ELEVATOR EQUIPMENT TO BELOW THE SHORT CIRCUIT CURRENT RATING (SCCR) OF THE ELEVATOR EQUIPMENT.
14. ELEVATOR AUTOMATIC TRANSFER SWITCH SHALL HAVE TWO SETS OF NORMALLY CLOSED DRY CONTACTS, ONE TO BE OPEN WHEN THE SWITCH IS IN THE EMERGENCY (STANDBY) POSITION, THE OTHER TO OPEN UPON INITIATION OF POWER TRANSFER AND TO CLOSE WHEN TRANSFER IS COMPLETE. SWITCH SHALL HAVE AN INHIBIT FUNCTION WHICH WILL DELAY TRANSFER TO NORMAL AND/OR EMERGENCY (STANDBY) POWER BY ADJUSTABLE PERIOD OF 0 - 300 SECONDS. SWITCH SHALL HAVE A PHASE MONITOR FEATURE, WHICH PROHIBITS THE TRANSFER OF POWER BETWEEN "LIVE" SOURCES UNLESS THE SOURCES ARE IN PHASE WITH EACH OTHER. IF A SHUNT-TRIP DEVICE IS PROVIDED, AN ADDITIONAL NORMALLY CLOSED CONTACT, WITH ALL ASSOCIATED WIRING AND CONDUIT TO CONTROLLER, IS REQUIRED FROM EMERGENCY (STANDBY) POWER SOURCE. THE EMERGENCY (STANDBY) POWER SYSTEM PROVIDED SHALL COMPLY WITH ANSI/NFPA 70 REQUIREMENTS 620.91.
15. E.C. SHALL PROVIDE WIRING FROM ANY AND ALL HOISTWAY ACCESS DOORS TO THE CORRESPONDING ELEVATOR CONTROLLER, PER ANSI 2.11.1, ASME A17.1, NFPA 70-SECTION 620 FOR THE PURPOSE OF PREVENTING THE OPERATION OF THE DRIVING MACHINE UNLESS THE ACCESS PANELS OR DOORS ARE CLOSED AND LOCKED. THE E.C. SHALL COORDINATE WITH THE ELEVATOR SUPPLIER AND VERIFY EXACT WIRING AND CONNECTION REQUIREMENTS PRIOR TO ANY WORK.

NOTES:

1. ROUTE ALL ELEVATOR FEEDERS & ELEVATOR RELATED CIRCUITS AS REQUIRED TO COMPLY WITH NFPA 101, ARTICLE 7.2.12.2.4. FROM EMERGENCY PANELBOARD TO ELEVATOR MACHINE ROOM, PIT & SHAFT AS FOLLOWS:
a. HORIZONTAL RUNS - UNDER THE BUILDING FLOOR SLAB OR ENCASED IN 4" OF CONCRETE.
b. VERTICAL RUNS - ENCASED IN 4" OF CONCRETE.
c. ALTERNATIVE TO HORIZONTAL & VERTICAL RUNS - MINERAL INSULATED (TYPE M.I. 2-HOUR FIRE RATED) CABLE MAY BE USED.

2. ALL LOW VOLTAGE ELEVATOR RELATED CABLING REQUIREMENTS SHALL USE CIRCUIT INTGREITY CABLE (TYPE C.I. CABLE).

ELEVATOR/FIRE ALARM SEQUENCE OF OPERATION

SMOKE DETECTOR AND HEAT DETECTOR ASSOCIATED WITH THE ELEVATOR MACHINE ROOM SHALL BE WIRED AS REQUIRED PER THE FIRE ALARM MANUFACTURERS RECOMMENDATIONS TO HAVE THE FOLLOWING SEQUENCE OF OPERATION:

1. THE SMOKE DETECTOR SHALL CAPTURE THE ELEVATOR WHEN THE FIRE ALARM SYSTEM IS ACTIVATED AND THEREFORE BRING THE ELEVATOR TO A PREDETERMINED FLOOR OR ALTERNATE FLOOR AS REQUIRED (COORDINATE WITH ELEVATOR MANUFACTURER & INSTALLER).

0' 2' 4' 8' 16'

N

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	RD

REVISIONS:

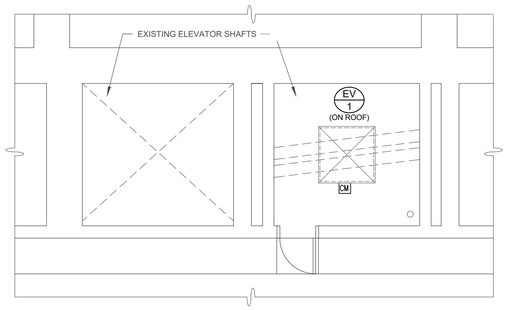
DRAWING TITLE:

ELECTRICAL PROPOSED FLOOR PLANS

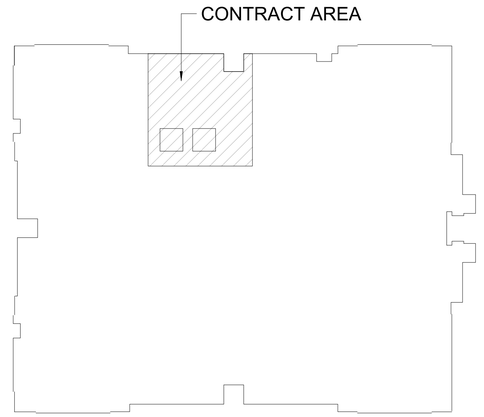
DRAWING NO.:

E1.1

ELECTRICAL NOTE:
1. CONTRACTOR TO PROVIDE ADD ALTERNATE PRICING FOR ELEVATOR RELIEF VENT. ARCHITECT/CONTRACTOR TO VERIFY IF EXISTING ELEVATOR RELIEF VENT IS SUFFICIENT DURING THE DEMOLITION PHASE.

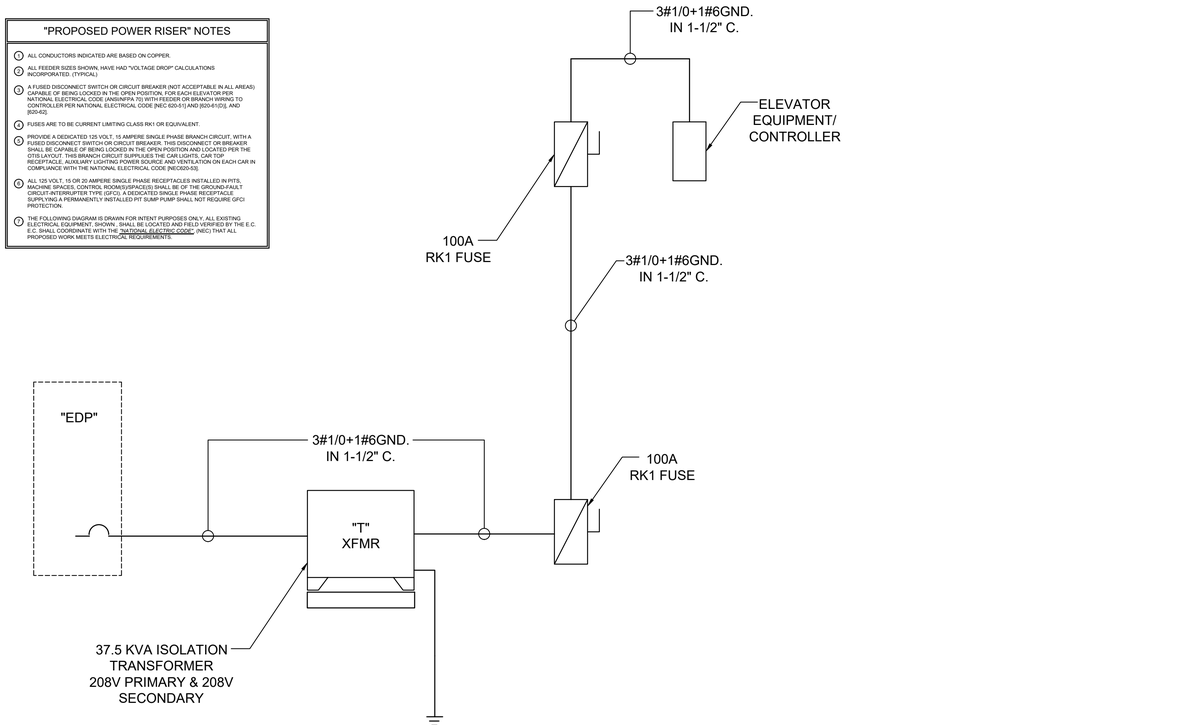


4 PROPOSED ATTIC PLAN
1/4" = 1'-0"



"PROPOSED POWER RISER" NOTES

1. ALL CONDUCTORS INDICATED ARE BASED ON COPPER.
2. ALL FEEDER SIZES SHOWN, HAVE HAD "VOLTAGE DROP" CALCULATIONS INCORPORATED. (TYPICAL)
3. A FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER (NOT ACCEPTABLE IN ALL AREAS) CAPABLE OF BEING LOCKED IN THE OPEN POSITION, FOR EACH ELEVATOR PER NATIONAL ELECTRICAL CODE (ANSI/NFPA 70) WITH FEEDER OR BRANCH WIRING TO CONTROLLER PER NATIONAL ELECTRICAL CODE [NEC 620-51(A)] AND [620-61(D)], AND [620-62].
4. FUSES ARE TO BE CURRENT LIMITING CLASS RK1 OR EQUIVALENT.
5. PROVIDE A DEDICATED 125 VOLT, 15 AMPERE SINGLE PHASE BRANCH CIRCUIT, WITH A FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER. THIS DISCONNECT OR BREAKER SHALL BE CAPABLE OF BEING LOCKED IN THE OPEN POSITION AND LOCATED PER THE OTIS LAYOUT. THIS BRANCH CIRCUIT SUPPLIES THE CAR LIGHTS, CAR TOP RECEPTACLE, AUXILIARY LIGHTING POWER SOURCE AND VENTILATION ON EACH CAR IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE [NEC620-53]
6. ALL 125 VOLT, 15 OR 20 AMPERE SINGLE PHASE RECEPTACLES INSTALLED IN PITS, MACHINE SPACES, CONTROL ROOMS/SPACES(S) SHALL BE OF THE GROUND-FAULT CIRCUIT-INTERRUPTER TYPE (GFCI). A DEDICATED SINGLE PHASE RECEPTACLE SUPPLYING A PERMANENTLY INSTALLED PIT SUMP PUMP SHALL NOT REQUIRE GFCI PROTECTION.
7. THE FOLLOWING DIAGRAM IS DRAWN FOR INTENT PURPOSES ONLY. ALL EXISTING ELECTRICAL EQUIPMENT, SHOWN , SHALL BE LOCATED AND FIELD VERIFIED BY THE E.C. E.C. SHALL COORDINATE WITH THE "NATIONAL ELECTRIC CODE", (NEC) THAT ALL PROPOSED WORK MEETS ELECTRICAL REQUIREMENTS.



"PROPOSED" POWER RISER DIAGRAM
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SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Slatersville, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:
ISSUED FOR PRICING

DATE:	01/17/25
PROJECT NO:	2418
DRAWN BY:	MM
CHECKED BY:	RD

REVISIONS:

DRAWING TITLE:
ELECTRICAL PROPOSED FLOOR PLANS

DRAWING NO.:
E1.2

FIRE ALARM LEGEND

NFPA SYMBOL	TYPICAL INDUSTRY SYMBOL	DESCRIPTION / REMARKS
60cd	60cd F	FIRE ALARM SYSTEM, HORN / STROBE DEVICE, SUB-SCRIPT INDICATES CANDELA RATING.
R	R	FIRE ALARM SYSTEM, RELAY.
AIM	MM	FIRE ALARM MONITOR MODULE.
AOM	CM	FIRE ALARM CONTROL MODULE.

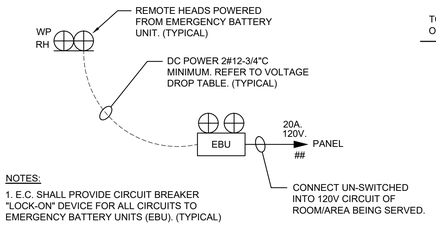
NFPA SYMBOL	TYPICAL INDUSTRY SYMBOL	DESCRIPTION / REMARKS
	S	FIRE ALARM SYSTEM, SMOKE DETECTOR.
R	SH	FIRE ALARM SYSTEM, COMBINATION SMOKE / (RATE-OF-RISE) HEAT DETECTOR.
CO	S CO	FIRE ALARM SYSTEM, CARBON MONOXIDE DETECTOR.
P	S	FIRE ALARM SYSTEM, DUCT SMOKE DETECTOR LOCATED IN THE SUPPLY & RETURN DUCTWORK OF HVAC UNITS WITH 2000 CFM (OR) GREATER.
R	135° R/R H	FIRE ALARM SYSTEM, RATE-OF-RISE TEMPERATURE HEAT DETECTOR, SUB-SCRIPT INDICATES TEMPERATURE RATING. (SUITABLE FOR 50'-0" "ON CENTER" MOUNTING)

EMERGENCY LIGHTING SYMBOL LEGEND

SYMBOL	DESCRIPTION	MOUNTING
	SELF-CONTAINED EMERGENCY, WALL MOUNTED LIGHTING FIXTURE WITH DUAL LIGHTING HEADS. COORDINATE WITH E.C. TO PROVIDE ALL NECESSARY ACCESSORIES FOR WIRING DEVICES. MFG. MULE, CAT. #SQ-80-LED-W	WALL
EBU	SELF-CONTAINED EMERGENCY, WALL MOUNTED LIGHTING FIXTURE WITH DUAL LIGHTING HEADS & SPARE CPACITY FOR REMOTE LIGHTING HEADS. COORDINATE WITH E.C. TO PROVIDE ALL NECESSARY ACCESSORIES FOR WIRING DEVICES. MFG. MULE, CAT. #SQ-80-LED-W-REM	WALL

EMERGENCY LIGHTING NOTE:

ALL NEW EMERGENCY BATTERY UNITS AND EXIT SIGNS, SHALL BE TIED INTO LOCAL AREA, 120 VOLT LIGHTING CIRCUIT AHEAD OF ANY / ALL SWITCHING. (TYPICAL)



NOTES:

1. E.C. SHALL PROVIDE CIRCUIT BREAKER "LOCK-ON" DEVICE FOR ALL CIRCUITS TO EMERGENCY BATTERY UNITS (EBU). (TYPICAL)
2. DETAIL IS TYPICAL TO ALL DRAWINGS, UON.

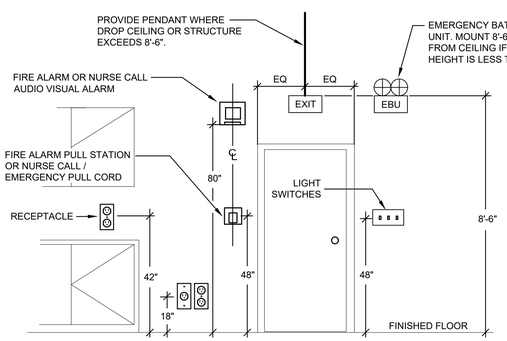
TYPICAL EMERGENCY LIGHTING CONNECTION DETAIL

NOT TO SCALE

EMERGENCY LIGHTING 6-VOLT SYSTEM VOLTAGE DROP TABLE

TOTAL WATTS ON WIRE RUN	WIRE GAUGE 12	10	8	6
6	94	150	238	379
7	81	129	204	325
8	70	112	179	284
10	56	90	143	227
12	44	70	112	178
14	40	64	102	162
16	33	53	84	134
18	30	47	75	119
20	28	45	71	114
21	27	43	68	108
24	24	38	60	95
25	21	34	54	86
30	19	30	48	76
35	15	25	39	63
40	13	21	33	53
48	11	17	28	44
50	11	17	27	43
75	7	11	18	29
100	5	8	14	21
125	4	7	11	17
150	3	5	9	14
175	3	5	8	12
200	2	4	6	10
225	2	4	6	10
250	2	3	5	9

MAXIMUM LENGTH OF RUN IN FEET



NOTE:

THIS DETAIL INDICATES CENTERLINE FOR FIRE ALARM/PULL STATION SWITCHES AND RECEPTACLES. HOWEVER THIS SAME CENTERLINE PRINCIPLE SHALL BE FOR ALL GROUP MTD. ELECTRICAL DEVICES. IF FIRE ALARM IS ON SAME SIDE OF DOOR AS SWITCHES, PULL STATION SHALL BE HORIZONTALLY SEPARATED BY A MINIMUM OF 18". THIS ELEVATION IS A GENERAL ARRANGEMENT OF OF DEVICES. ARCHITECT PLANS TAKE PRECEDENCE FOR EXACT LOCATIONS.

MOUNTING HEIGHT DETAIL

NOT TO SCALE

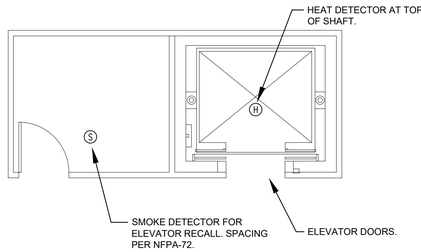
FIRE ALARM NOTES

1. E.C. SHALL PROVIDE CIRCUIT BREAKER LOCK-ON DEVICES FOR FACP AND NAC CIRCUITS.
2. E.C. SHALL FURNISH AND INSTALL REMOTE INDICATING LIGHTS/TEST SWITCHES FOR DUCT SMOKE DETECTORS.
3. REFER TO FLOOR PLANS FOR EXACT NUMBER OF DEVICES AND CANDELA RATINGS.
4. COLOR CODE WIRING PER THE LATEST EDITION OF THE STATE FIRE CODE.
5. SPLICES WILL NOT BE ALLOWED. WIRENUTS WILL NOT BE ALLOWED.
6. RED PAINTED TERMINAL CABINETS & BOXES WITH LOCKABLE COVERS SHALL BE PROVIDED AT ALL JUNCTION POINTS.
7. AFC FIRE ALARM / CONTROL CABLE TYPE MC (UL LISTED) MAY BE USED ABOVE CEILINGS AND IN CONCEALED AREAS WHERE ACCEPTABLE TO THE LOCAL AUTHORITY HAVING JURISDICTION. EXPOSED AREAS SHALL BE EMT. PAINTED PER ARCHITECTS DIRECTION. ALL CONDUCTORS SHALL BE A MINIMUM OF #16AWG SOLID COPPER, TYPE THHN, THWN OR TFN. ALL WIRING SHALL RUN CONTINUOUSLY FROM DEVICE TO DEVICE.
8. THE CONTRACTOR AT COMPLETETION OF THE FIRE ALARM SYSTEM SHALL TEST THE ENTIRE SYSTEM PER THE LOCAL FIRE DEPARTMENTS REQUIREMENTS. THE CONTRACTOR SHALL REPLACE OR FIX ANY PART OF THE SYSTEM NOT PROPERLY WORKING.
9. THE MINIMUM SEPARATION BETWEEN THE OUTGOING AND RETURN FIRE ALARM CIRCUITS SHALL BE A MINIMUM OF 1-FOOT VERTICALLY AND 4-FEET HORIZONTALLY IN ACCORDANCE WITH THE PROVISIONS OF NFPA-72.
10. ALL FIRE ALARM SYSTEM COMPONENTS & MOUNTING HEIGHTS SHALL COMPLY WITH ADA REQUIREMENTS.
11. E.C. SHALL PROVIDE ANY AND ALL AUXILARY EQUIPMENT IN ORDER TO PROVIDE A COMPLETE, PROPERLY FUNCTIONING SYSTEM. COORDINATE REQUIREMENTS WITH LOCAL MANUFACTURERS REP.
12. ALL FIRE ALARM STROBE SIGNAL DEVICES SHALL BE SYNCHRONIZED TYPE DEVICES AND COMPLY WITH ADA REQUIREMENTS.
13. NO T-TAPPING OF FIRE ALARM WIRING SHALL BE ALLOWED. (TYPICAL)
14. ALL FIRE ALARM WIRING & RACEWAY SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT BE LOCATED AS TO BE DAMAGED BY BUILDING USE.
16. ALL SMOKE DETECTORS SHALL BE MOUNTED ON THE CEILING AND UL LISTED FOR CEILING MOUNTING AND LOCATED NOT LESS THAN 12-INCHES FROM ANY WALL. DETECTORS SHALL NOT BE IN A DIRECT AIR FLOW NOR CLOSER THAN 3-FEET FROM ANY AIR SUPPLY DIFFUSER. (TYPICAL)
17. UL LISTED INSULATED THROAT, SET SCREW CONNECTORS SHALL BE USED WITH MC CABLE INSTALLATIONS, (CLAMP CONNECTORS ARE NOT ALLOWED). A CABLE CUTTING TOOL WITH CONTROLLED DEPTH OF CUT SHALL BE USED IN ALL MC CABLE INSTALLATIONS.
18. FAULT ISOLATION MODULES SHALL BE INSTALLED FOR EVERY 25 DEVICES AND IN NO CASE SHALL THE LENGTH OF AN AREA BE DISABLED BY A WIRE-TO-WIRE SHORT CIRCUIT FAULT EXCEED 200' IN ANY ONE DIRECTION. WHERE A SINGLE CIRCUIT SERVES MORE THAN ONE FLOOR; FAULT ISOLATION MODULES SHALL BE INSTALLED TO PREVENT A WIRE-TO-WIRE SHORT CIRCUIT FAULT ON ONE FLOOR TO DISABLE THE CIRCUIT ON ANOTHER FLOOR.
19. WIRING FOR THE FIRE ALARM SYSTEM SHALL BE CLASS "A", INCLUDING THE WIRING BETWEEN MONITOR MODULES AND SPRINKLER DEVICES.
20. REFER TO THE SPECIFICATIONS FOR THE "SEQUENCE OF OPERATION" AND ADDITIONAL INFORMATION.
21. E.C. SHALL PRODUCE A MANUFACTURER'S COMPLETE FIRE ALARM SYSTEM ONE-LINE DIAGRAM AND ADDRESS PLAN DURING THE SHOP DRAWING SUBMITTAL PROCESS.
22. E.C. SHALL PROVIDE ALARM INDICATORS AND HVAC EQUIPMENT OVERRIDE SWITCHES MOUNTED IN UTILITY ROOMS WITH FIRE ALARM PANEL. ALL SWITCHES AND HEATING UNITS SHALL BE CLEARLY LABELED BY NUMBERS AS PER PLANS.
23. E.C. SHALL OBTAIN FROM THE LOCAL FIRE DEPARTMENT, A LIST OF FIRE ALARM ZONE CODES AND DESCRIPTIONS AND PROGRAM INTO FIRE ALARM SYSTEM FOR ANY NEW ADDITIONS AS REQUIRED.
24. E.C. SHALL UPGRADE EXISTING FIRE ALARM SYSTEM BATTERIES TO ACCOMMODATE ALL NEW DEVICES AND ALL EXISTING DEVICES PER CODE. COORDINATE WITH FIRE ALARM SYSTEM MANUFACTURER AND PROVIDE BATTERY CALCULATIONS SUBMITTAL PACKAGE TO THE LOCAL FIRE DEPARTMENT, ARCHITECT & OWNER.
25. TWO INDICATIONS OF ALARM ARE REQUIRED FOR SPRINKLER SYSTEM: MAIN FLOW & ZONE.

ELEVATOR/FIRE ALARM SEQUENCE OF OPERATION

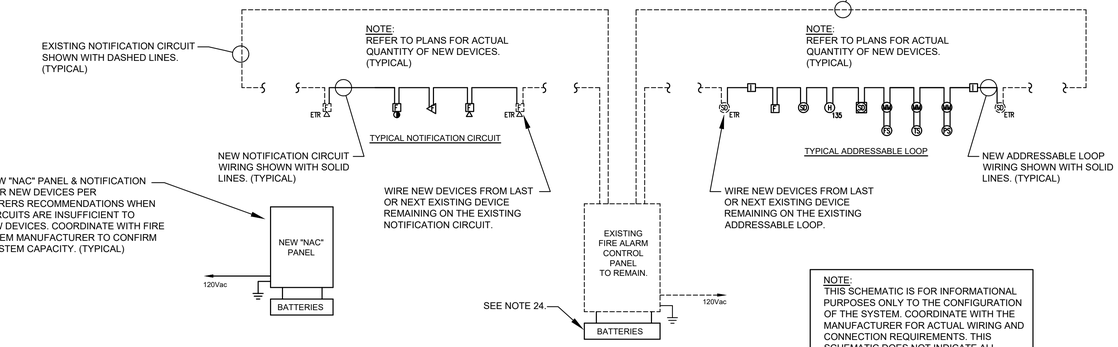
THE SMOKE DETECTOR ASSOCIATED WITH THE ELEVATOR MACHINE ROOM SHALL BE WIRED AS REQUIRED PER THE FIRE ALARM MANUFACTURERS RECOMMENDATIONS TO HAVE THE FOLLOWING SEQUENCE OF OPERATION:

1. THE SMOKE DETECTOR SHALL CAPTURE THE ELEVATOR WHEN THE FIRE ALARM SYSTEM IS ACTIVATED AND THEREFORE BRING THE ELEVATOR TO A PREDETERMINED FLOOR OR ALTERNATE FLOOR AS REQUIRED (COORDINATE WITH ELEVATOR MANUFACTURER & INSTALLER).



TYPICAL ELEVATOR MACHINE ROOM & PIT

NOT TO SCALE

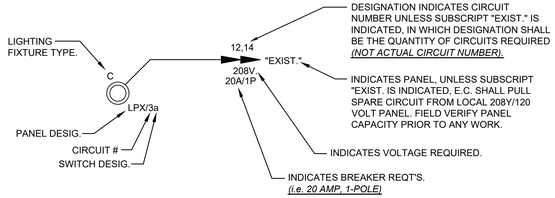


NOTE:

THIS SCHEMATIC IS FOR INFORMATIONAL PURPOSES ONLY TO THE CONFIGURATION OF THE SYSTEM. COORDINATE WITH THE MANUFACTURER FOR ACTUAL WIRING AND CONNECTION REQUIREMENTS. THIS SCHEMATIC DOES NOT INDICATE ALL DEVICES.

TYPICAL FIRE ALARM SCHEMATIC

NOT TO SCALE



NOTES:

1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN CONTRACT. INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS BUT NOT ON PLANS, AND VICE VERSA, SHALL APPLY OR SHALL BE PROVIDED AS THOUGH EXPRESSLY REQUIRED ON BOTH. IT IS NOT INTENDED THAT EVERY JUNCTION BOX, OFFSET, FITTING OR COMPONENT BE SPECIFIED OR SHOWN ON DRAWINGS; HOWEVER, CONTRACT DOCUMENTS REQUIRE PROVISION OF ALL COMPONENTS AND MATERIALS NECESSARY FOR COMPLETE AND OPERATIONAL ELECTRICAL INSTALLATION, WHETHER OR NOT INDICATED OR SPECIFIED.
2. BRANCH CIRCUIT WIRING MAY NOT BE GRAPHICALLY SHOWN ON DRAWINGS AND MAY BE SHOWN BY CIRCUIT NUMBERS BESIDE FIXTURES, DEVICES AND EQUIPMENT. PROVIDE COMPLETE WIRING SYSTEM WHETHER OR NOT SHOWN GRAPHICALLY. WIRING IS SHOWN BY CONDUIT RUNS ON DRAWINGS WHERE SPECIFIC ROUTING IS REQUIRED OR FOR OTHER SPECIAL REASONS. ONLY ROOMS WITH MULTIPLE SWITCHING HAVE "SWITCH CONTROL LETTERS" ASSIGNED. PROVIDE THHN CONDUCTORS IN AREAS WITH HIGH AMBIENT TEMPERATURES SUCH AS BOILER ROOMS; INCINERATOR ROOMS, MECHANICAL EQUIPMENT ROOMS ETC., FOR SIZES LARGER THAN NO. 10 AWG.

TYPICAL CIRCUITING DETAIL

NOT TO SCALE

TYPICAL FIRE STOPPING NOTES

A. GENERAL: FIRE STOPPING SHALL BE PROVIDED BY THIS CONTRACTOR FOR ALL FLOOR, CEILING AND FIRE RATED WALL PENETRATIONS FOR CONDUIT, SLEEVES AND/OR CABLING AS REQUIRED BY JOB CONDITIONS.

B. THE CONTRACTOR SHALL PROVIDE A FIRE STOP SYSTEM IN ACCORDANCE WITH THE FOLLOWING:

1. THE SYSTEM SHALL CONSIST OF A WATERBASED SEALANT AND SUITABLE DAMMING MATERIALS (WHERE REQUIRED) AND BE INSTALLED PER MANUFACTURER'S REQUIREMENTS.
2. THE SEALANT SUPPLIED SHALL BE A TWO STAGED INTUMESCENT AND CAPABLE OF EXPANDING UP TO 8 TIMES ITS ORIGINAL VOLUME.
3. THE SEALANT SUPPLIED SHALL CONTAIN NO ASBESTOS, NO FIBERGLASS, AND NO SOLVENTS NOT CORROSIVE MINERAL SALTS OF ANY KIND.
4. THE SEALANT SHALL FORM A SURFACE CAPABLE OF BEING SANDED AND PAINTED TO MATCH SURROUNDING SURFACES AND SHALL BE IMPERVIOUS TO WATER WHEN DRY.
5. THE FIRE STOP SYSTEM SHALL BE TESTED TO THE TIME/TEMPERATURE REQUIREMENTS OF ASTM E119 AND SHALL BE UL1479 (ASTM E814) AND CLASSIFIED FOR UP TO 3 HOURS.
6. THE FIRE STOP SEALANT SHALL BE SPECSEAL SEALANT AS MANUFACTURED BY SPECIFIED TECHNOLOGIES, INC. OR APPROVED EQUAL.
7. SPECIAL CARE SHALL BE TAKEN WITH ELECTRICAL SYSTEMS NOT TO COMPROMISE ANY OF THE BUILDING FIRE PARTITIONS, FLOORS, WALLS OR MEMBRANES. PROVIDE ALL FIRESTOPPING REQUIRED TO COMPLY WITH THE BUILDING CODE, THE ELECTRICAL CODE AND THE UL LISTING OF EACH ASSEMBLY. COORDINATE LOCATIONS AND TYPES OF MEMBRANES WITH ARCHITECT.

SignalWorks
11 ALEPPO STREET - PROVIDENCE, RI 02909
(401) 400.ARCH
HELLO@SIGNALWORKSARCHITECTURE.COM

STAMP:

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

CITY HALL ELEVATOR
25 DORRANCE STREET
PROVIDENCE, RI 02903

PROJECT STATUS:

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DATE:	01/17/25
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CHECKED BY:	RD

REVISIONS:

DRAWING TITLE:

ELECTRICAL SCHEDULES & DETAILS

DRAWING NO.:

E2.1