

# **REQUEST FOR PROPOSALS**

Item Description: GENERAL CONTRACTOR SERVICES FOR ELMWOOD COMMUNITY CENTER CPF IMPROVEMENTS

Procurement/MinuteTraq #: 49186

**Date to be opened:** 5/19/2025

Issuing Department: Public Property

### QUESTIONS

- Please direct questions relative to the specifications outlined (beginning on page 13) to the issuing department's subject matter expert:
  - o Name: Ben Lobaugh
  - o Title: Senior Capital Improvements Project Manager
  - Email Address: blobaugh@providenceri.gov
- Please direct questions related to the bidding process, how to fill out forms, and how to submit a bid (Pages 1-6) to the Purchasing Department.
  - Email: <u>purchasing@providenceri.gov</u>
    - 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 13-14) to the MBE/WBE Outreach Director for the City of Providence, Grace Diaz
  - o Email: <u>gdiaz@providenceri.gov</u>
    - Please use subject line "MBE WBE Forms"

### **Pre-bid Conference**

There will be a Mandatory Pre-Bid ConferenceDate:Monday, April 28, 2025Location:Elmwood Community Center, 155 Niagara St, Providence, RI 02907

### Deadline for questions submissions: Friday, May 9, 2025 at 12:00pm



### **INSTRUCTIONS FOR SUBMISSION**

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 3<sup>rd</sup> 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

**\*\***<u>PLEASE NOTE</u>: 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 <u>NOT</u> requested to be provided in your initial bid by design.

<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. 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.



### **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 <u>Technical Proposal for Qualification</u> bid package **MUST** include the following, in this order:

- Bid Form 1: Bidder's Blank as the cover page/ 1<sup>st</sup> page (see page 6 of this document)
- Bid Form 2: Certification of Bidder as 2<sup>nd</sup> page (see page 9 of this document)
- Bid Form 3: Certificate Regarding Public Records (see page 10 of this document)
- Bid Form 4: Affidavit of City Vendor (*see pages 11 and 12 of this document*)
- Forms from the Minority and Women Business Enterprise Program: Based on Bidder Category. See forms and instructions enclosed (page 13-14 of this document)

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

- 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* (as indicated on page 5 of this document under "Bid Terms")

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.



### **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. If the City Department that is seeking the within described bids deems that it is in the City's best interest, the City reserves the right to waive any requirement of this RFP.
- 9. 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 <u>Open</u> <u>Meetings Portal</u>.
- 10. 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.
- 11. In case of error in the extension of prices quoted, the unit price will govern.
- 12. 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.
- 13. 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.
- 14. A certificate of insurance will normally be required of a successful vendor.
- 15. For many contracts involving construction, alteration and/or repair work, State law provisions concerning payment of prevailing wage rates apply (<u>RIGL Sec. 37-13-1 et seq</u>.)
- 16. No goods should be delivered, or work started without a Purchase Order.
- **17.** Submit 2 copies of the bid to the City Clerk, unless the specification section of this document indicates otherwise.
- 18. 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.)



### **BID TERMS**

- Financial assurances may be required in order to be a successful bidder for Commodity or Construction and Service contracts. <u>If either of the first two checkboxes below is checked, the specified assurance</u> <u>must accompany a bid, or the bid will not be considered by the Board of Contract and Supply</u>. 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 <u>5</u> per centum (%) 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)  $\square$  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 **nighty (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, <u>RIGL 28-29-1</u>, 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.



### **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



### **BID BREAKDOWN – BASE BID**

A. DIV 01 – GENERAL REQUIREMENTS	\$
B. DIV 03 – CONCRETE	\$
C. DIV 04 – MASONRY	\$
D. DIV 05 – METALS	\$
E. DIV 06 – WOOD, PLASTICS, AND COMPOSITES	\$
F. DIV 07 – THERMAL & MOISTURE PROTECTION	\$
G. DIV 08 – OPENINGS	\$
H. DIV 09 – FINISHES	\$
I. DIV 10 – SPECIALTIES	\$
J. DIV 12 – FURNISHINGS	\$
K. DIV 22 – PLUMBING	\$
L. DIV 26 – ELECTRICAL	\$
M. DIV 27 – COMMUNICATIONS	\$
N. DIV 28 – SECURITY	\$
O. DIV 31 - EARTHWORK	\$
P. DIV 32 – EXTERIOR IMPROVEMENTS	\$
Q. DIV 33 – UTILITIES	\$
R. ALLOWANCE – PAINTING RESTORATION	\$ 10,000.00
S. ALLOWANCE – LANDSCAPE MATERIAL	\$ 5,000.00
T. ALLOWANCE – MISC ROOF REPAIR	\$ 15,000.00
U. ALLOWANCE – MASONRY REPOINTING	\$ 25,000.00
V. TOTAL BASE BID (LUMP SUM)	\$



### **UNIT PRICES**

1. BRICK MASONRY REPAIR (PER 10 SF)	\$ / 10 SF	7
2. BRICK VENEER REPOINTING REPAIR (PER 10 SF)	\$ / 10 SH	7

### **ALTERNATES**

ADD ALTERNATE 1 – Pressure wash & seal non-painted brick	\$
ADD ALTERNATE 2 – First floor flooring replacement	\$
ADD ALTERNATE 3 – Wireless locks for doors 112.1 and 116.1	\$

The above lump sum costs shall include all necessary labor and materials, inclusive of general conditions and all insurance, overhead and profit, etc. to deliver a complete project per the Construction Documents.

Signature of Representation

Title



### **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



### **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



### **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 <u>R.I.G.L. § 36-14-2</u>, "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 <u>Sec. 21.-28.1 (e)</u>).

a. Members of the Providence City Council?  $\Box$  Yes  $\Box$  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?  $\Box$  Yes  $\Box$  No

 If Yes, please complete the following: Recipient(s) of the Contribution: Contribution Date(s):
 Contribution Amount(s):



- c. The Mayor of Providence?  $\Box$  Yes  $\Box$  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?  $\Box$  Yes  $\Box$  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



### **MBE/WBE Participation Plan**

Please comple	te separate forms f	or each M	BE/WBE subcont	ractor/suppli	er to be utilized on the soli	citation.
Bidder's Name:						
Bidder's Address:						
Point of Contact:						
Telephone:						
Email:						
Procurement #:						
Project Name:						
including a description Please note that all MB time of bid. The MBE/ instructions and require • Nonprofit org • Construction provide upda	as of Minority and/o prise certification w (Check all that apple o capture commitme of the work to be per E/WBE subcontract WBE Directory can ements). ganizations are not projects unable to tes to the MBE/WI	r Woman ith the ly). ents between erformed an cors/supplie be found <u>h</u> <b>c required</b> the <b>identify su</b>	Id the percentage of rs must be certified ere. Please visit, the to complete the re ubcontractors prio	f the work as s by the Office e <u>City's MBE</u> st of this form	□ Neither MBE nor W d MBE/WBE subcontractors submitted to the prime contra- of Diversity, Equity and Op <u>WBE page</u> for details of the <b>n.</b> <b>hission (e.g. Design Build)</b>	s and suppliers, actor/vendor. oportunity at the e program (e.g.
Name of Subcontractor	**					
Type of RI Certificatio	n:	$\Box$ MBE			□Neither	
Address:						
Point of Contact:						
Telephone:						
Email:						
Detailed Description of Performed by Subcontr to be Supplied by Supp of Work provided in th Total Contract Value (S	actor or Materials lier Per the Scope e RFP		Subcontract Value (\$):		Participation Rate (%):	
Anticipated Date of Per	rformance:					
I certify under penalty	of perjury that the f	orgoing sta	tements are true an	d correct.		
Prime Contractor/Ve	ndor Signature			Title		Date
Subcontractor/Suppli	er Signature			Title		Date

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



### **MBE/WBE Waiver Request Form**

### Fill out this form only if you did not meet the City's 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 <u>gdiaz@providenceri.gov</u>, 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

Signature of City of Providence MBE/WBE Outreach Director / or Duly Authorized Representative Printed Name

Date Signed

Printed Name of City of Providence MBE/WBE Outreach Director Date Signed



# **BID PACKAGE SPECIFICATIONS**

This project includes all necessary labor and materials to perform renovations to the Elmwood Community Center at 155 Niagara St as outlined in the Construction Documents. See Attachment A for the Construction Drawings and Specifications package.

### 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/Levy Fee must be paid by each trade
  seeking a permit.
- This project qualifies for prevailing wages per the Davis Bacon Act (HUD). 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 <a href="https://sam.gov/content/wage-determinations">https://sam.gov/content/wage-determinations</a>. Weekly Certified payrolls must be Submitted with Pay Requests Including Monthly Utilization Form.
- Prime Contractor must have a Unique Entity ID (UEI) from sam.gov.
- Prime Contractor must be enrolled in a registered apprenticeship program.
- 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
- 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:
  - o Copies of Permits Signed off and Approved (If Any)
  - o 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.



# 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.

### The following attachments are included as part of this RFP:

- Attachment A Apprentice and First Source Requirements
- Attachment B Construction Documents



### **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 invoice.

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.



# CITY OF PROVIDENCE

Brett P. Smiley, Mayor

### **MEMORANDUM**

To:	Department of Public Property; Parks Department
From:	Law Department
Re:	Compliance with apprenticeship and "First Source" ordinances
Date:	April 21, 2023

The City of Providence has hired "Building Futures," an outside consulting group, to assist with monitoring the City's compliance with ordinances relating to construction projects. Specifically, Building Futures is monitoring the City's compliance with two (2) ordinances that require the City to maximize utilization of apprentices and Providence residents in City construction projects.

1) Providence Code of Ordinances Sec. 21-28.1, governing construction contracts of \$100,000 or more, requires that no less than 15% of the total labor hours performed by contractors and subcontractors on any given project are to be completed by apprentices registered in state-registered apprenticeship programs. This requirement pertains to all labor hours for a given project, not just those for new hires.

The Law Department recommends the inclusion of the following notice (or one substantially similar) in all RFP's for construction projects valued at \$100,000 or more:

### **APPRENTICE REQUIREMENTS.**

Attention of prospective bidders is called to the fact that this project is to be bid upon and executed under the City of Providence Code of Ordinances Chapter 21 Art. II Section 21-28.1 c(1) and (2) related to utilizing apprentices in the contract. This ordinance outlines requirements for utilizing not less than 15% of total hours worked by apprentices. The City may lower this percentage only if it determines in writing that compliance is not feasible or that it would be unduly cost prohibitive to the project. The attention of prospective bidders is also called to the fact that reporting the efforts undertaken and progress towards achieving the requirements in this ordinance is a condition for payment. Compliance reporting shall be submitted with any contract payment requisition, in a format to be specified by the City. This demonstration of compliance through such reports shall be a condition of the requisition for payment to be processed. Upon the contract being awarded to the successful bidder, a mandatory meeting will be scheduled to review the project

requirements relative to apprenticeship requirements and the process and protocols by which these goals will be achieved. At this meeting, specific forms and procedures for the documentation and achievement of these requirements by the successful bidder will be provided, discussed and agreed upon for the execution of the contract.

2) Providence "First Source" Ordinance Sec. 21-91 – Sec. 21-96 requires that when hiring new workers for a construction project, employers seek to hire Providence residents when available. If the awarded contractor, regardless of tier, is a signatory to a Collective Bargaining Agreement that governs the contractor's hiring and referral process, the contractor must contact both Building Futures and the local hiring halls to request apprentices or journey workers who are residents of Providence. In the case of apprentices, this is a way to meet the requirements of both ordinances with one hire.

The Law Department recommends the inclusion of the following notice (or one substantially similar) in all RFP's for City construction projects:

### "FIRST SOURCE" REQUIREMENTS.

Attention of prospective bidders is called to the fact that this project is to be bid upon and executed under the City of Providence Code of Ordinances Chapter 21 Art. III 1/2 First Source Agreements Sec. 21-91 through 21-96. This ordinance outlines requirements for hiring Providence residents to work on this project. The City may waive this requirement only upon a determination in writing that qualified residents of Providence are not available for the project, pursuant to Sec. 21-94(e). The attention of prospective bidders is called to the fact that reporting the efforts undertaken and progress towards achieving the requirements in this ordinance is a condition for payment. Compliance reporting shall be submitted with any contract payment requisition, in a format to be specified by the City. This demonstration of compliance through such reports shall be a condition of the requisition for payment to be processed. Upon the contract being awarded to the successful bidder, a mandatory meeting will be scheduled to review the project requirements relative to the First Source Agreements and the process and protocols by which these goals will be achieved. At this meeting, specific forms and procedures for the documentation and achievement of these requirements by the successful bidder will be provided, discussed and agreed upon for the execution of the contract.

If your department or any of your contractors has difficulty securing registered apprentices or Providence residents to participate in construction projects, you are encouraged to contact Building Futures, who may be able to assist:

William Bryan, AUP Manager, Renowned Advising <renownedadvising@gmail.com> or

Rita Holahan, Building Futures <rholahan@bfri.org>

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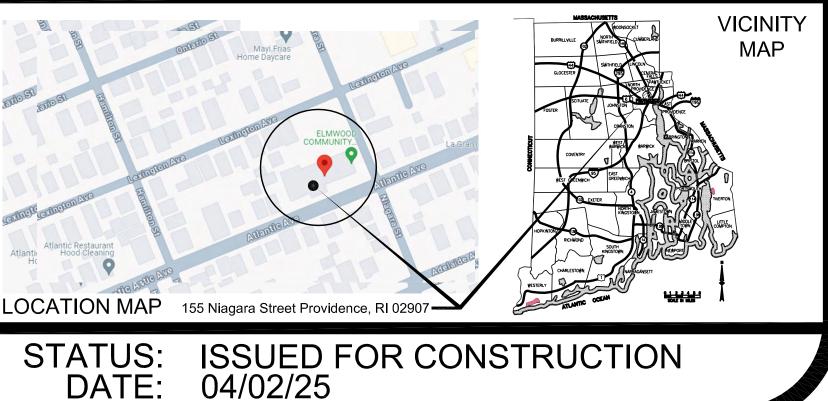


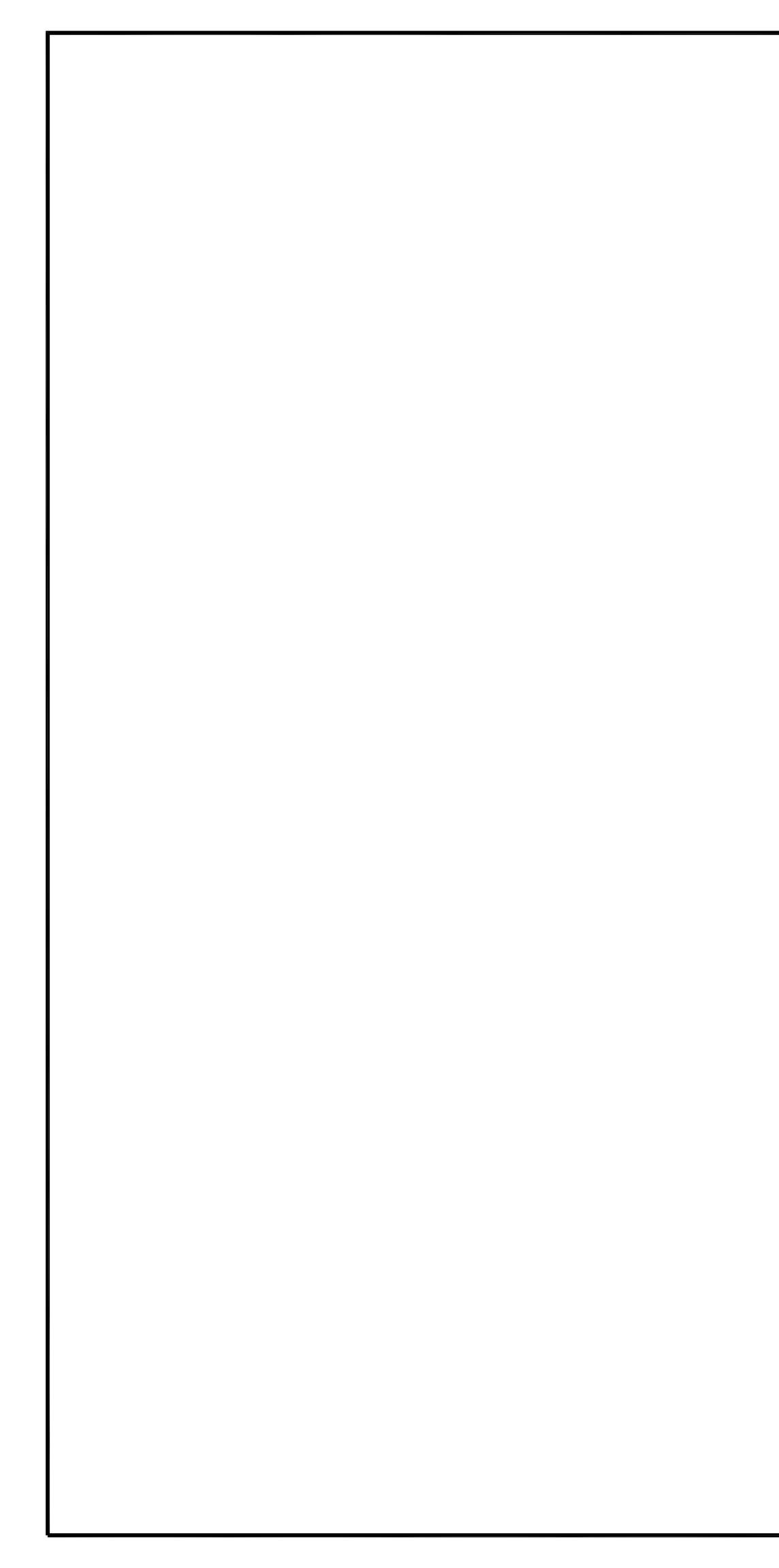
PLUMBING & ELECTRICAL

**TELECOMMUNICATIONS, AUDIO VISUAL** & SECURITY



		LIST	OF DRAWINGS
REVISION	DATE	SHEET # 000	SHEET NAME COVER
<u>CIVIL</u>		C1	GENERAL NOTES & LEGENDS
		C2	SITE AND UTILITY PLAN
		C3	CONSTRUCTION DETAILS
ARCHITE	<u>CTURAL</u>	0004	
	04/02/2025	G001	ABREVIATIONS & SYMBOLS
	04/02/2025	A000	CODE REVEIEW
	04/02/2025	A010	CODE REVIEW PLAN
	04/02/2025	A020 D100	CODE REVIEW PLAN FIRST FLOOR DEMO PLAN
	04/02/2025 04/02/2025	D100	SECOND FLOOR DEMO PLAN
	04/02/2025	A100	FIRST FLOOR PLAN
	04/02/2025	A101	SECOND FLOOR PLAN
	04/02/2025	A200	EXTERIOR ELEVATION
	04/02/2025	A201	EXTERIOR ELEVATION
	04/02/2025	A202	EXTERIOR ELEVATION
	04/02/2025	A203	EXTERIOR ELEVATION
	04/02/2025	A204	EXTERIOR ELEVATION
	04/02/2025	A400	CANOPY SECTION & FRAMING
	04/02/2025	A503	DETAILS
	04/02/2025 04/02/2025	A601 A700	SECOND FLOOR REFLECTED CEILING PLAN
	04/02/2025	A700 A900	FIRST FLOR FINISH PLAN
	04/02/2025	A901	SECOND FLOOR FINISH PLAN
	04/02/2025	A910	DOOR SCHEDULE & DETAILS
ELECTRIC	CAL	5000	
		E000 E301	ELECTRICAL SYMBOLS LISTS, ABBREVIATIONS AND NOTES ELECTRICAL POWER PLAN - FIRST FLOOR
		E302	ELECTRICAL POWER PLAN - SECOND FLOOR
		E501	ELECTRICAL ONE LINE DIAGRAM
		E601	ELECTRICAL DETAILS
		E701	ELECTRICAL SCHEDULES
		E801 E802	ELECTRICAL SPECIFICATIONS ELECTRICAL SPECIFICATIONS CONT.
	MUNICATIONS		ELECTRICAL SPECIFICATIONS CONT.
		 TCO.01	TELECOM LEGEND AND NOTES SHEET
		TC1.00	TELECOM FIRST FLOOR PLAN
		TC1.01	TELECOM SECOND FLOOR PLAN
		TC2.00 TC2.01	TELECOM DETAIL SHEET TELECOM DETAIL SHEET
		102.01	TELECOM DETAIL SHEET
AUDIO V	<u>ISUAL</u>		
audio v	<u>'ISUAL</u>	AV0.01	AUDIO VISUAL LEGEND AND NOTES SHEET
audio v	<u>'ISUAL</u>	AV1.00	AUDIO VISUAL FIRST FLOOR PLAN
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AUDIO V	<u>'ISUAL</u>	AV1.00 AV1.01 AV2.00 AV2.01 AV2.02 AV2.03 AV2.04 AV2.05 AV2.06 AV2.07 AV2.08 AV2.08	AUDIO VISUAL FIRST FLOOR PLAN AUDIO VISUAL SECOND FLOOR PLAN AUDIO VISUAL DETAILS SHEET AUDIO VISUAL DETAILS SHEET
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# ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AF ACP	ABOVE FLOOR ACCESS PANEL
	ACCESSORY, ACCESSORIES
ACOUS	ACOUSTICAL ACOUSTIC CEILING TILE
ADH	ADHESIVE
ADJ	ADJUSTABLE AGGREGATE (S)
A/C	AIR CONDITIONING
ÁVB AC	AIR/VAPOR BARRIER ALTERNATING CURRENT ALTERNATE
ALT	ALTERNATE
	ALUMINUM ALUMINUM THRESHOLD
AT ANC	ALUMINUM THRESHOLD ANCHOR (S) ANCHORAGE (S)
AB	ANCHOR BOLTS
L,∢ ANOD	ANGLE ANODIZED
ANT	ANTENNA (E)
APP	APPROVED, APPROVAL APPROXIMATE
APPROX	AREA DRAIN
© ATT	AT ATTACH, ATTACHMENT
	AUTOMATIC LOUVER DAMPER
AVE AVG	AVENUE
AVG	AVERAGE
BTB	BACK TO BACK
BM BMK	BEAM BENCH MARK
BG	BEARING
BPL BIT	BEARING PLATE BITUMINOUS
BC	BOTTOM OF CURB
BLK BLKG	BLOCK BLOCKING
BD	BOARD
BF	BOTTOM OF FOOTING
BO BOC	BOTTOM OF BOTTOM OF CURB
BS	BOTH SIDES
BW BOT	BOTH WAYS BOTTOM
ВКТ	BRACKET
BK BRG	BRICK BRIDGING, BRIDGE (D)
BTU	BRITISH THERMAL UNIT
BLDG	BUILDING
BUR CK	BUILT-UP ROOFING CHALK
CBT, CAB CPT	CABINET CARPET
CI	CAST IRON
CB	CATCH BASIN
CTR	CEILING CENTER
CL, CL	CENTERLINE
CTC C	CENTER TO CENTER CENTIGRADE (CELSIUS) CERAMIC TILE
CLF CB	CHAIN-LINK FENCE CHALKBOARD
сн, [	CHANNEL
CM CV	CENTIMETER CHECK VALVE
CHWR	CHILLED WATER RETURN
CHWS CKT	CHILLED WATER SUPPLY CIRCUIT
CO	CLEANOUT
	CLEAR, CLEARANCES
CLS CW	CLOSURE COLD WATER
C,COL	COLUMN
COMP	COMPRESS (ED),(ION),(IBLE) CONCRETE (PORTLAND CEMENT)
CONC CMU	CONCRETE MASONRY UNITS
COND	CONDUIT
CX CONT	CONNECTION CONTINUOUS
CLL	CONTRACT LIMIT LINE
CONTR CJ	CONTRACTOR CONTROL JOINT
CFL	COUNTERFLASHING (S)
CS CU	COUNTERSINK, COUNTERSUNK CUBIC
CU	COPPER
CFM CFS	CUBIC FEET PER MINUTE CUBIC FEET PER SECOND
CFS CF	CUBIC FEET
CU IN	
CY CYL	CUBIC YARD CYLINDER, CYLINDRICAL
DPR DP	DAMPER DAMPPROOF (ED),(ING)
DL	DEAD LOAD
DB DEG	DECIBEL DEGREE
	DEGREE DEMOLISH, DEMOLITION
DEP	DEPRESSED
DET DIA or Ø	DETAIL DIAMETER
DIAG	DIAGONAL
DIM DC	DIMENSION DIRECT CURRENT
DCX	DISCONNECT (ION)
DPN DPL	DISPENSER DISPOSAL, DISPOSABLE
DR	DOOR
DBL DH	DOUBLE DOUBLE-HUNG
DTA	DOVETAIL ANCHOR
DTS DN	DOVETAIL ANCHOR SLOT DOWN
DS	DOWNSPOUT
D DI	DRAIN, DRAINAGE LINE DRAIN INLET
DI DT	DRAIN TILE
DWG,DRWG	DRAWING (S) DRINKING FOUNTAIN
DF DMH	DRINKING FOUNTAIN DROP MANHOLE
EIFS	EXT. INSUL FINISH SYSTEM
EW	EACH WAY
EA EFF	EACH EFFICIENCY
E, ELECT.	ELECTRIC, ELECTRICAL
EP EWC	ELECTRIC PANEL ELECTRIC WATER COOLER
EL, ELEV	ELEVATION
ENC EQ, =	ENCLOSE, ENCLOSURE EQUAL (TO)
EQP, EQUIP	EQUIPMENT
EXH	EXHAUST
ED EF	EXHAUST DUCT EXHAUST FAN
EH	EXHAUST HOOD
EXIST. EXP	EXISTING EXPANSION
EXP	EXPOSED
EB EJ	EXPANSION BOLT EXPANSION JOINT
ET	EXTENDED, EXTENSION
EPS EXT	EXTRUDED POLYSTYRENE EXTERIOR
FAB	FABRICATE
FO FS, FOS	FACE OF FACE OF STUD
FAS	FASTEN, FASTENER
FPM FPS	FEET PER MINUTE FEET PER SECOND
FNDR	FEMININE NAPKIN DISPENSER UNIT
FNDP	FEMININE NAPKIN DISPOSAL UNIT
11	FINISH FLOOR

	FBD	FIBERBOARD	мв
	FGL FIL	FIBERGLASS FILLER (S)	MH MFD,MFR'D
	FIN FFE	FINISH FINISH FLOOR ELEVATION	MFR MFG
	FFL FTR	FINISH FLOOR LINE FINNED TUBE RADIATION	MBL MK
	FA	FIRE ALARM STATION	MAS
	FDC FE	FIRE DEPARTMENT CONN. FIRE EXTINGUISHER	MCJ MJ
	FEC, FXC FHC	FIRE EXTINGUISHER CABINET FIRE HOSE CABINET	MO MTL
	FHR FH	FIRE HOSE RACK FIRE HYDRANT	MAX MC
	FMN FP	FIRE MAIN FIREPROOF (ING)	MED MDF
	FR	FIRE RESISTANT	MBR
	FRC FRT	FIRE-RESISTANT COATING FIRE-RETARDANT TREATMENT	MMB,MEME MTL
	FSP FXD	FIRE STANDPIPE FIXED	METC ME
	FXT FLG	FIXTURE FLASHING	MRE M
	FHCS FHWS	FLAT HEAD COUNTERSUNK SCREW	MEZZ
	FLX	FLEXIBLE	MIC MM
	FLR FD	FLOOR, FLOORING FLOOR DRAIN	MWK MIN
	FGR FLU	FLOOR GRILLE (REGISTER) FLUORESCENT	MIR MIS
	FL FT	FLOW LINE FOOT, FEET	MXV MOD
	FC FTG	FOOTCANDLES	MLD MDO
	FWK	FORMWORK FOUNDATION (WALL)	MT MHT
	FND, FDW FR	FRAME (D),(ING)	MUL
	FBO F&I	FURNISHED BY OTHERS FURNISH & INSTALL	NL
	FURR FUT	FURRING FUTURE	NAT NRC
	FAI FRP	FRESH AIR INTAKE FIBER REINFORCED PLASTIC	NOM
	FSL	FUSIBLE LINK	NC
	GAL	GALLON (S)	NIC NTS
	GPH GPM	GALLONS PER HOUR GALLONS PER MINUTE	NO,# OC
	GPS GALV	GALLONS PER SECOND GALVANIZED	K,L,H
	GI GST	GALVANIZED IRON GALVANIZED STEEL	OPG, OPN OPR
	G G KT	GAS	OPP O.H.,OPH
	GAV	GASKET (ED) GATE VALVE	OHS
	GA GLB	GAUGE GLASS BLOCK	OSB OAE
	GMU GB	GLAZED MASONRY UNITS GRAB BARS	OZ OD
	GRD	GRADE, GRADING	OA OH
	GRT GVL	GRANITE GRAVEL	OHB
	GR GD	GRILLE GROUND (ED)	ohd of
	GT GYP. BD.	GROUT (ED) GYPSUM WALLBOARD	OFI OFCI
	GWB	GYPSUM WALLBOARD	ох
	GYL GFRC	GYPSUM LATH GLASS FIBER REINF. CONC.	PT
	GPL	GYPSUM PLASTER	PNT, PTD PR
	HH HA	HAND HOLD HANGER	PNL PAR, //
	HBD HC	HARDBOARD HANDICAP(PED)	PBD PTN
	HDN	HARDENER (ED)	PCT or %
	HDW HWD	HARDWARE HARDWOOD	PERIM
	HD HDR	HEAD HEADER	PERP, <u> </u> P
	HDE HTG	HEAT DETECTOR HEATING	PLAS PL
	HAC H & V	HEATING & AIR CONDITIONING	PLUMB PLYWD
		HEATING & VENTILATING HEATING, VENTILATING &	PNU POL
	HVC	AIR CONDITIONING HEATING, VENTILATING, COOLING	PE
	Hz HPL	HERTZ (CYCLES PER SECOND) HIGH PRESSURE LAMINATE	PCF PLF
	H∨ HWY	HIGH VOLTAGE HIGHWAY	PSF PSI
	но	HOLD OPEN	PIC PDF
	HCWD HM	HOLLOW CORE WOOD HOLLOW METAL	PCC
	HMD HMF	HOLLOW METAL DOOR HOLLOW METAL FRAME	PREFAB PRN
	HK HR	HOOK (S) HOUR	PRF PM
	HOR, HORZ.	HORIZONTAL	PMTL PVT
	HP HB	HORSEPOWER HOSE BIBB	PROJ
	HW HWR	HOT WATER HOT WATER RETURN	PL, P_ P&l
	HWC HWF	HOT WATER, CIRCULATOR HOT WATER FAUCET	PUB PA
	HWH	HOT WATER HEATING	PB PU
	HWT HYD	HOT WATER TANK HYDRANT	PP
	IN INCL	INCH INCLUDING (ED),(SIVE)	PD PIV
	INFO ID	INFORMATION INSIDE DIAMETER	PC PVC
	INSL	INSULATE (D),(ATION)	QT
		INSULATED METAL CLAD INTERIOR, INTERNAL	RW RAD
	INV IE	INVERT INVERT ELEVATION	RA, R
	IDM	ISOLATE DISC. METALS	R RL
	JAN JT	JANITOR JOINT	RR RECP
	JF JS	JOINT FILLER JOINT SEALER	REF
	J	JOIST	RE
	JCT JB	JUNCTION JUNCTION BOX	RFC
	KVA KW	KILOVOLT-AMPERE KILOWATT	RC REQ,REQ'D
	K KD	KIP KNOCK DOWN	R & S R & D
			R & R RESIL
	LAD	LABORATORY LADDER	RTN RVS, REV
	LAM LAT	LAMINATE (D) LATERAL	REV
	LAV LB	LAVATORY LAG BOLT	RPM RPS
	LBL	LABEL POUND'S	RH ROW
	LBS, # LCC	LEAD COATED COPPER	RD RFG
	LDR LH	LEADER LEFT-HAND	RM RO
	LWOD LIN	LESS WIDTH OF DOOR LINEN	RU
	LP LS	LIGHT PROOF LIMESTONE	RP
	LTL	LINTEL	
	LL LLV	LIVE LOAD LONG LEG VERTICAL	
	LW LP	LIGHT WEIGHT LOW PRESSURE	
	LOC	LOCATION LOCKER	
	LKR		
	LG	LONG, LENGTH LONGITUDINAL	
Г	LG LONG L or LH	LONGITUDINAL LONG SPAN STEEL JOIST	
Г	LG LONG	LONGITUDINAL	

	МВ	MACHINE BOLT	SDL
	MH MFD,MFR'D	MANHOLE MANUFACTURED	SAN SCN
	MFR	MANUFACTURER	SLT
	MFG MBL	MANUFACTURING MARBLE	SLR STG
	МК	MARK	SEC
	MAS MCJ	MASONRY MASONRY CONTROL JOINT	SEL SPT
	MJ	MASONRY JOINT	SVC
	MO MTL	MASONRY OPENING MATERIAL (S)	SSK STH
	MAX	MAXIMUM	SHT
	MC	MEDICINE CABINETS	SH
	MED MDF	MEDIUM MEDIUM DENSITY FIBERBOARD	S&CR SHR
	MBR	MEMBER	SIM
	MMB,MEMB MTL	MEMBRANE METAL	SH SK
	METC	METAL CLAD	SKL
	ME MRE	METAL EDGE METAL ROOF DECK(ING)	SL SDE, SD
	М	METER (S)	SMV
W	MEZZ	MEZZANINE	SCWD SSM
	MIC MM	MICROPHONE MILLIMETER	SP
	MWK	MILLWORK	SPK SPEC
	MIN MIR	MINIMUM MIRROR	
	MIS	MISCELLANEOUS	SPF SPR
	MXV MOD	MIXING VALVE MODULAR	SQ, 山
		MOLDING	SF SY
	MDO MT	MEDIUM DENSITY OVERLAY MOUNT (ED), (ING)	STAG
	MHT MUL	MOUNTING HEIGHT MULLION	SS
	MUL	MOLLION	STD ST
	NL	NAILABLE NATURAL (FINISH)	STIFF
	NAT	NOISE-REDUCTION	STN STO
			SD
	NOM NC	NOMINAL NON-CORROSIVE	ST S
	NIC	NOT IN THIS CONTRACT	SIP SUP
	NTS NO,#	NOT TO SCALE NUMBER	SUSP
	OC	ON-CENTER	SAT
	K,L,H	OPEN-WEB STEEL JOIST	SUSP CEIL SYM
	OPG, OPNG OPR	OPENING OPERATOR	SYS
	OPP	OPPOSITE	тв
	O.H.,OPH OHS	OPPOSITE HAND OPPOSITE HAND SIMILAR	TEL TV
	OSB	ORIENTED STRAND BOARD	TMP, TEMP
	OAE	OR APPROVED EQUAL	TCV TP
	OZ OD	OUNCE (S) OUTSIDE DIAMETER	TZ
	OA	OVERALL	THM
	OH OHB	OVERHEAD OVERHEAD BRACED	THS TH
	OHD	OVERHEAD DOOR	THR
	OF OFI	OWNER FURNISHED OWNER FURNISHED & INSTALLED	TCL TOL
	OFCI	OWNER FURNISH-	TG, T & G
	ох	CONTRACTOR INSTALL OXYGEN	TO TOC
	PT	PRESSURE TREATED	TOS, TS
	PNT, PTD PR	PAINT, PAINTED PAIR	TOW TRANS
	PNL	PANEL	TR
	PAR, // PBD	PARALLEL PARTICLE BOARD	tji Tp
	PBD PTN	PARTITION	TYP
	PCT or % PF	PERCENT (AGE) PERFORATED (D)	ТОМ
	PCT or % PF PERIM	PERFORATÉD (Ď) PERIMETER	TOM UHF
	PCT or % PF	PERFORATED (D)	ТОМ
	PCT or % PF PERIM PERP, <u> </u> P PLAS	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER	TOM UHF UF UG UL
	PCT or % PF PERIM PERP, P	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING	TOM UHF UG UL UNF UNO
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD	TOM UHF UG UL UNF UNO UH
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED)	TOM UHF UG UL UNF UNO UH UK UV
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PE	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL	TOM UHF UG UL UNF UNO UH UK
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER LINEAR FOOT	TOM UHF UG UL UNF UNO UH UK UV
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL POL PE PCF PLF PSF	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER LINEAR FOOT POUNDS PER SQUARE FOOT	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL POL PE PCF PLF	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER LINEAR FOOT	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VB
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PCF PLF PSF PSI PIC PDF	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER LINEAR FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING)	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VA VB VP
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PE PCF PLF PSF PSI PIC	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER LINEAR FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VA VA VA VP VNR VE
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	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PCF PLF PSF PSF PSI PIC PDF PCC PREFAB PRN PRF PM	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VA VAB VB VP VNR VE VR, VTR VTR VER, VERT
	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PCF PLF PSF PSI PIC PDF PCC PREFAB PRN PRF PM PMTL	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFINISH (ED) PREFORMED PREMOLDED PRESSED METAL	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VAB VB VP VNR VE VR, VTR VTR VTR VER, VERT VHF
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	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PCF PLF PSF PSI PIC PDF PCC PREFAB PRN PRF PM PMTL PVT PROJ PL, PL	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFINISH (ED) PREFORMED PRESSED METAL PRIVATE PROPERTY LINE	TOM UHF UG UL UNF UNO UH UK UV UAS VJ VA VA VA VAB VB VP VNR VE VR, VTR VR, VTR VTR VTR VTR VTR VTR VTR VIF VIF VIF VIF VIF VIF VIF VIF VIF VIF
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	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PCF PLF PSF PSI PIC PDF PCC PREFAB PRN PRF PM PMTL PVT PROJ PL, P PL PL, P PL PL, P PL PL PL PL PL PL PL PL PL P	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFINISH (ED) PREFORMED PRESED METAL PRIVATE PROVIDE & INSTALL PUBLIC PUBLIC ADDRESS SYSTEM	TOM UHF UF UG UL UNF UNO UH UK UV UAS VJ VA VAB VB VP VA VAB VB VP VNR VE VR, VTR VR, VTR VTR VTR VTR VTR VTR VTR VTR VF VF
	PCT or % PF PERIM PERP, P PLAS PLUMB PLYWD PNU POL PE PCF PLF PSF PSI PIC PDF PCC PREFAB PRN PRF PM PMTL PVT PROJ PL, P PL PL, P PL PB PA PB	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFINISH (ED) PREFORMED PRESSED METAL PRIVATE PROJECT PROPERTY LINE PROVIDE & INSTALL PUBLIC PUBLIC ADDRESS SYSTEM PULL BOX	TOM UHF UF UG UL UNF UNO UH UK UV UAS VJ VA VAB VB VV VA VAB VB VP VNR VE VR, VTR VTR VTR VTR VTR VTR VTR VTF VLF VLF VLF VS
	PCT or % PF PERIM PERP, P PLAS PLUMB PLYWD PNU POL PE PCF PLF PSF PSI PIC PDF PCC PREFAB PRN PRF PM PMTL PVT PROJ PL, PL PUB PA PB PU PP	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFINISH (ED) PREFORMED PRESED METAL PRIVATE PROJECT PROPERTY LINE PROVIDE & INSTALL PUBLIC PUBLIC ADDRESS SYSTEM PULL BOX PULL BOX PULL CHAIN PUMP	TOM UHF UF UG UL UNF UNO UH UK UV UAS VJ VA VAB VB VV VA VAB VB VP VNR VE VR, VTR VTR VTR VTR VTR VTF VLF VLF VLF VLF VS VT
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	PCT or % PF PERIM PERP, P PLAS PL PLUMB PLYWD PNU POL PE PCF PSF PSF PSF PSF PSF PSF PSF PCC PREFAB PRN PMTL PVT PVT PVT PVD PL, <sup>P</sup> PB PUB PA PB PUB PA PB PUB PA PB PUB PA PB PUB PA PC PC PC PC PC PC PC PC PC PC	PERFORATED (D) PERIMETER PERPENDICULAR PHASE PLASTER PLATE PLUMBING PLYWOOD PNEUMATIC POLISH (ED) PORCELAIN ENAMEL POUNDS PER CUBIC FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE FOOT POUNDS PER SQUARE INCH POURED INPLACE CONCRETE POWER DRIVEN FASTENER (ING) PRECAST CONCRETE PREFABRICATED PREFORMED PREFORMED PREFORMED PRESED METAL PROVIDE & INSTALL PUBLIC PUBLIC ADDRESS SYSTEM PULL BOX PULL BOX PULL, PULL CHAIN PUMP PUMP DISCHARGE POST INDICATOR VALUE PHYSICALLY CHALLENGED POLY VINYL CHLORIDE QUARRY TILE RACEWAY RADIATOR, RADIATION RADIUS RISER	TOM UHF UF UG UL UNF UNO UH UK UV UAS VJ VA VAB VB VP VNR VE VR, VTR VTR VR, VERT VF VR, VERT VF VF VIF VIF VIF VIF VIF VIF VTR VTR VTR VTR VTR VTR VTR VTR VTR VTR
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SECTION SELECT (OR) SEPTIC TANK	DRAWING # SCALE	© RGB 2025
SERVICE SERVICE SINK	DETAIL #	Certification
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STORAGE STORM DRAIN STREET	ELEVATION TAG	
STRUCTURAL STRUCTURAL INSULATED PANEL SUPPORT		
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TACKBOARD TELEPHONE	DOOR TAG	
TELEVISION TEMPER (ED) TEMPERATURE CONTROL VALVE	DOOR # = FIRST 3 NUMBERS DENOTE ROOM WHERE DOOR IS LOCATED DECIMAL # INDICATES	
TEST PIT TERRAZZO THERMOMETER		
THERMOSTAT THICK, THICKNESS	WINDOW	
THRESHOLD TIME CLOCK TOLERANCE	TAG INDICATES WINDOW TYPE:	
TONGUE AND GROOVE TOP OF TOP OF CONCRETE / CURB	IF LETTER, THEN EXTERIOR IF NUMBER, THEN INTERIOR	
TOP OF STEEL TOP OF WALL	WORK NOTES XXX INDICATE ENTIRE SPACE/AREA	
TRANSFORMER TRANSOM TRUSS JOIST 'I' SECTION		
TURNING POINT TYPICAL TOP OF MASONRY	&/OR ITEMS	
ULTRAHIGH FREQUENCY	## RE: A002 FOR LIST OF MATERIALS	50 Holden Street Providence, Rhode Island 02908
UNDERFLOOR (DUCT) UNDERGROUND UNDERWRITERS LABORATORY	PHYSICALLY CHALLENGED	Phone: (401) 272-1730 Fax: (401) 273-7156
UNFINISHED UNLESS NOTED OTHERWISE	AND/OR HANDICAPPED ACCESSIBLE	E-mail: rgbinfo@rgb.net www.rgb.net
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UPWARD ACTING SECTIONAL	PROJECT NORTH	Project
VACUUM VACUUM BREAKER	NORTH REF	
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WEATHERSTRIFFING WEEPHOLE WELDED WIRE FABRIC WIDE, WIDTH	ALIGN WORK &/or ITEMS	Drawing Status
WIDE-FLANGE BEAM WIRE GLASS	VERTICAL ELEV. REFERENCE FIRST FLOOR	ISSUED FOR
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WITHOUT WOOD	INTERIOR WALL DESIGNATIONS:	
WOOD BASE WOOD BEAM WORK BY OTHERS		Issued On 04/02/25
WORK BY OWNER WORK BY TENANT WORK	WALL TYPE 'Z' DESIGNATION INDICATES STUD/BLOCK SIZE INSULATION PER WALL TYPE DESCRIPTION	Sheet Contents ABREVIATIONS &
WORKROOM WROUGHT IRON	WALL TYPE DESIGNATION 'F' DESIGNATION	SYMBOLS
X-RAY	INDICATES FIRE ASSEMBLIES FIRE RATED ASSEMBLY RATING IN HOURS	
WYE FITTING ZONE	"M" INDICATES MASONRY WALL "CL" INDICATES PROTECTED COLUMN ASSEMBLY – SEE COLUMN FIREPROOFING NOTES THIS SHEET	
ZINC COATED ZEE STUD	EXAMPLE – WALL "A2" EXAMPLE – WALL TYPE "M4" "A" – WALL TYPE "M" – MASONRY WALL	Project Number. 6844
	"2" – STUD THICKNESS "4" – CMU THICKNESS <u>METAL STUDS</u> <u>WOOD STUDS</u> <u>MASONRY WALLS</u>	Drawing No.
	$1 = 15/8"$ STUDS $3 = 2 \times 3$ STUDS $2 = 15/8"$ SOAP $2 = 21/2"$ STUDS $4 = 2 \times 4$ STUDS $4 = 4"$ BLOCK	G001
	$3 = 35/8"$ STUDS $6 = 2 \times 6$ STUDS $6 = 6"$ BLOCK 4 = 4" STUDS $8 = 8"$ BLOCK 6 = 6" STUDS $10 = 10"$ BLOCK 12 = 12" BLOCK	
		Sheet of

# GENERAL CONSTRUCTION NOTES:

- AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE TRAILER AT ALL TIMES. DEVIATIONS OR CHANGES WILL NOT BE ALLOWED UNLESS BY WRITTEN APPROVAL FROM THE ENGINEER.
- 2. SITEWORK CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL APPROVALS HAVE BEEN SECURED. REQUIRED PERMITS/APPROVALS FOR THE PROJECT INCLUDE BUT NOT LIMITED TO THE FOLLOWING: DPW EXCAVATION IN PUBLIC RIGHTS OF WAY PERMIT AND DPW STORM CONNECTION PERMIT.
- 3. ALL IMPROVEMENTS MUST COMPLY WITH THE 'AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUILDELINES (ADAAG)'. NOTE THAT THE DETAIL CONTAINED WITHIN THIS PLAN MAY NOT SHOW THE DETAIL NECESSARY TO CONTSTRUCT WALKWAYS, RAMPS AND SPACES TO COMPLY WITH THE ADAAG REQUIREMENTS BUT THE CONTRACTOR IS REPOSNSIBLE TO PROVIDE THE LEVEL OF CARE NECESSARY TO BE CERTAIN THAT THE CONSTRUCTED PRODUCT MEETS THESE STANDARDS.
- 4. THE CONTRACTOR MUST RETAIN THE SERVICES OF A REGISTERED LAND SURVEYOR IN THE STATE OF RHODE ISLAND TO LAYOUT ON THE GROUND ALL NEW ELEMENTS OF WORK. IF ANY WORK IS INSTALLED PRIOR TO THE ABOVE REQUIREMENT AND IF ANY WORK IS NOT SATISFACTORY TO THE ENGINEER, THE CONTRACTOR MUST REPLACE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
- 5. THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SITE CONDITIONS AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING, INSTALLING OR PROCEEDING WITH WORK.
- 6. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES AND TO TAKE WHATEVER NECESSARY MEASURES NEEDED TO PROVIDE FOR THEIR PROTECTION. THE ENGINEER HAS DILIGENTLY ATTEMPTED TO LOCATE AND INDICATE ALL EXISTING UNDERGROUND UTILITIES AND FACILITIES ON THE DRAWINGS: HOWEVER, THE INFORMATION SHOWN IS FOR THE CONTRACTORS CONVENIENCE ONLY. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF UTILITIES SHOWN OR NOT SHOWN. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION, VERIFY ALL DIMENSIONS, SITE CONDITIONS AND MATERIALS. THE CONTRACTOR MUST CONTACT THE LOCAL UTILITY COMPANIES FOR EXACT LOCATION OF UTILITIES PRIOR TO THE START OF ANY CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE START OF ANY WORK. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AND REPLACE ANY AND ALL DAMAGE MADE TO UTILITIES BY THE CONTRACTOR.
- 7. THE CONTRACTOR MUST NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITIES IN THE AREA OF PROPOSED CONSTRUCTION, EXCAVATION OR BLASTING AT LEAST THREE WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO THE START OF ANY CONSTRUCTION, EXCAVATION OR BLASTING. ALL WATER, SEWER, GAS AND ALL OTHER UTILITIES MUST BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
- METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS FOR THE CITY OF PROVIDENCE AND THE STATE OF RHODE ISLAND DEPARTMENT OF TRANSPORTATION.
- 8.1. ALL CONSTRUCTION IN THE PUBLIC ROW MUST BE IN ACCORDANCE WITH THE CITY'S STANDARD DETAILS AVAILABLE AT HTTPS: //WWW.PROVIDENCERI.GOV/PUBLIC-WORKS/FORMS/ UNDER "REPORTS + PUBLICATIONS", OR AT HTTPS: //WWW.PROVIDENCERI.GOV/WP-CONTENT/ UPLOADS/2019/06/PROVIDENCE-DPW-STANDARD-DETAILS.PDF.
- 8.2. THE STATE OF RHODE ISLAND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION, AS AMENDED, AND THE RHODE ISLAND STANDARD DETAILS ARE MADE A PART HEREOF, AS IF ATTACHED HERETO.
- 9. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY PAVEMENT, DRIVEWAYS, SIDEWALKS, WALL, CURBS, ETC. DAMAGED DURING CONSTRUCTION WITH MATCHING MATERIALS.
- 10. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE PROJECT SITE CONDITIONS THROUGHOUT CONSTRUCTION. INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND. INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONJUNCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.
- 11. ALL MATERIALS USED FOR CONSTRUCTION MUST BE NEW AND FREE OF DEFECTS. USED OR SALVAGED MATERIAL WILL NOT BE ALLOWED UNLESS WRITTEN APPROVAL FROM THE OWNER IS OBTAINED BY THE CONTRACTOR.
- 12. AT ALL TIME THE CONTRACTOR MUST MAINTAIN ACCESS FOR EMERGENCY VEHICLES AROUND AND TO ALL BUILDINGS. (I.E. IN TIMES OF RAIN OR SNOW. ROADS MUST ABLE TO CARRY A FIRE TRUCK BY BEING PAVED OR HAVING A CRUSHED STONE BASE, ETC.). WIDTH OF EMERGENCY VEHICLE ACCESS MUST BE A MINIMUM OF 20 FEET WIDE. ACCESS TO BUILDINGS THAT HAVE A FIRE SPRINKLER SYSTEM OR STANDPIPE MUST BE WITHIN 40 FEET OF THE FIRE DEPARTMENT CONNECTION (FDC). NFPA 1141 3-1
- 13. NECESSARY BARRICADES, LIGHTS, SIGNS AND OTHER TRAFFIC CONTROL METHODS AS MAYBE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC MUST BE PROVIDED AND MAINTAINED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR. ALL TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 2003 INCLUDING ALL REVISIONS.
- 14. ANY AND ALL RI HIGHWAY BOUNDS AND PERMANENT SURVEY MARKERS SHALL BE PROTECTED THROUGHOUT CONSTRUCTION.
- 15. REFER TO ARCHITECTURAL, STRUCTURAL, AND MECHANICAL PLANS FOR ALL BUILDING INFORMATION.
- 16. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR IS REQUIRED TO DEVELOP AND IMPLEMENT A PLAN FOR THE TEMPORARY CONTROL OF VEHICULAR AND PEDESTRIAN TRAFFIC FOR WORK WITHIN PUBLIC STREET RIGHT-OF-WAY AT THE SITE EGRESS. CONTRACTOR SHALL OBTAIN APPROVAL OF SAID PLAN FROM APPROPRIATE STATE AND COMMUNITY PUBLIC SAFETY OFFICIALS.
- 17. WHEN IT IS NECESSARY TO CLOSE OFF A STREET, THE FIRE DEPARTMENT AND POLICE DEPARTMENT SHALL BE NOTIFIED BY THE CONTRACTOR.
- 18. IF ANY EXISTING STRUCTURES AND/OR UTILITIES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, EITHER ON THE PROJECT SITE, ADJACENT PROPERTIES, OR WITHIN STATE RIGHT-OF-WAY, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

# SURVEY NOTES:

- I. THE EXISTING CONDITIONS INDICATED HEREON ARE TAKEN FROM PLAN TITLED "PARTIAL EXISTING CONDITION AND TOPOGRAPHY PLAN" FOR ASSESSOR'S PLAT 52 LOT 563. SITUATED ON 155 NIAGARA STREET PROVIDENCE, RHODE ISLAND. PREPARED FOR STUDIO JAED. PREPARED BY GAROFALO & ASSOCIATES, INC. JOB NUMBER: 7286-00. DWG. NO. 7286-00-ECS. DATED: SEPTEMBER 2023. THE EXISTING CONDITIONS HAVE BEEN AMENDED TO RFFLECT CONSTRUCTED CONDITIONS BASED ON DESIGN CONDITIONS ON PLAN TITLED "ELMWOOD COMMUNITY CENTER RENOVATION SITE PLANSN" A.P. 52 LOTS 132 & 563, 155 NIAGARA STREET PROVIDENCE, RHODE ISLAND. PREPARED FOR STUDIO JAED. PREPARED BY GAROFALO & ASSOCIATES, INC. JOB NUMBER: 7286-00. DWG. NO. 7286-00 BASE. DATED: DECEMBER 2023, LAST REVISED 4/12/24.
- THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. (PLEASE CONTACT DIGSAFE PRIOR TO CONSTRUCTION @ 1-888-344-7233).
- HORIZONTAL DATUM: RHODE ISLAND STATE PLANE NAD 83 VERTICAL DATUM: NAVD 88\* DATUM WAS DERIVED BY OBSERVED GPS ORTHOMETRIC HEIGHTS VARIATIONS BETWEEN LOCAL BENCHMARKS MAY APPLY.

# **GENERAL UTILITY NOTES:**

- DRAWINGS.
- ERRORS DISCOVERED IN THE PLANS.
- PROPERLY CONSTRUCT THE WORK.
- WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- JOINTS UNLESS NOTES OTHERWISE, OR APPROVED BY ENGINEER.
- PROVIDENCE AND STATE STANDARDS AND SPECIFICATIONS.

# **GENERAL DRAINAGE & GRADING NOTES:**

- OF ALL BUILDING ENTRANCES.
- DIRECTION.
- AND PAVED AREAS.
- FINISH GRADE.
- SMOOTH FIT AND CONTINUOUS GRADE.

1. THE CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND ALL LOCAL AUTHORITIES & UTILITY COMPANIES TO VERIFY LOCATIONS OF UTILITIES WITHIN THE AREA 72 HOURS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION FOR THE PURPOSE OF COORDINATING THE MARKING OF UNDERGROUND UTILITIES. LOCATION AND DEPTHS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE VERIFY, LOCATE AND PROTECT EXISTING UTILITIES IN THE FIELD WHETHER OR NOT SHOWN ON THE

2. ALL WORK SHALL BE IN COMPLETE ACCORDANCE WITH ALL APPLICABLE STATE, FEDERAL AND LOCAL CODES, AND ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER/DEVELOPER. THE CONTRACTOR SHALL REFER TO THE PROVIDENCE WATER. RULES & REGULATIONS FOR THE SERVICE INSTALLATION & EXTENSION REQUIREMENTS OF WATER LINES.

3. THE CONTRACTOR SHALL COORDINATE LOCATION AND INSTALLATION OF ALL UNDERGROUND UTILITIES AND APPURTENANCES TO MINIMIZE DISTURBANCE OF CURBING, PAVING AND COMPACTED SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE TOWN ENGINEER & ALL LOCAL UTILITY COMPANIES 48 HOURS BEFORE EACH PHASE OF CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER OF ANY DISCREPANCIES OR

4. BEDDING REQUIREMENTS SPECIFIED HEREIN ARE TO BE CONSIDERED AS MINIMUMS FOR RELATIVELY DRY, STABLE EARTH CONDITIONS. ADDITIONAL BEDDING SHALL BE REQUIRED FOR ROCK TRENCHES AND WET AREA. CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO PROVIDE SUCH ADDITIONAL BEDDING AS MAY BE REQUIRED TO

5. COMPACTION OF THE BACKFILL OF ALL TRENCHES SHALL BE COMPACTED TO THE DENSITY OF 90% OF THE THEORETICAL MAXIMUM DRY DENSITY (ASTM D698). BACKFILL MATERIAL SHALL BE FREE FROM ROOTS. STUMPS OR OTHER FOREIGN DEBRIS AND SHALL BE PLACED IN LIFTS NOT TO EXCEED ONE FOOT IN COMPACTED FILL THICKNESS. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF PROJECT APPROVAL

6. ALL PIPING LAYOUT INDICATED ON THESE PLANS IS DIAGRAMMATIC ONLY AND DOES NOT SHOW ALL THE REQUIRED FITTINGS FOR PROPER ALIGNMENT. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED FITTINGS TO OBTAIN PROPER ALIGNMENT AND FOR EXISTING UTILITY CONNECTIONS BASED UPON FIELD CONDITIONS.

7. STORM DRAINS 12" AND OVER SHALL BE SMOOTH INTERIOR WALL AND EXTERIOR CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE CAPABLE OF WITHSTANDING (H-20) LOAD UNLESS NOTED OTHERWISE. PIPE SHALL BE JOINED USING BELL & SPIGOT JOINTS MEETING OR EXCEED ASTM F2648. THE JOINT SHALL BE SOIL-TIGHT AND GASKETS SHALL MEET OR EXCEED ASTM F477. HDPE PIPE SHALL BE AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS INC. (ADS), HANCOR PIPE OR LANE PIPE. ALL STORM DRAINAGE PIPING SHALL BE LAID ON A SMOOTH CONTINUOUS GRADE WITH NO VISIBLE BENDS AT THE JOINTS. WHERE INDICATED ON DRAWINGS REINFORCED CONCRETE PIPE (RCP) PIPE SHALL BE CLASS III RCP WITH "O" RING GASKET JOINTS.ALL STORM PIPE ENTERING STRUCTURES SHALL BE GROUTED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT. ROOF DRAIN AND STORM DRAINS UNDER 12" SHALL BE SDR- 35 (ASTM D-3034) PVC WITH PUSH ON RUBBER RING

WHENEVER UTILITIES ARE TO BE INSTALLED WITHIN THE CITY OF PROVIDENCE PUBLIC OR PRIVATE RIGHT OF WAYS. THE TRENCH MUST BE BACKFILLED WITH GRANULAR BASE PER CITY STD. 60.2.0P. ALL AREAS OF ROADWAY PAVEMENT & WALKWAYS DISTURBED DURING CONSTRUCTION SHALL BE RE-PAVED PER THE CITY OF

1. MAXIMUM RUNNING SLOPE ALONG ANY SIDEWALK SHALL BE 5%. MAXIMUM CROSS SLOPE ACROSS ANY SIDEWALK SHALL BE 2%. A MINIMUM 5'x5' LANDING MUST BE PROVIDED IN FRONT

2. ALL ADAAG PARKING SAPCES AND LOADING SPACES SHALL BE 2% MAXIMUM SLOPE IN ANY

3. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL

4. ALL GRATES AND COVERS IN PAVED AREAS SHALL BE FLUSH WITH PAVEMENT, AND SHALL HAVE TRAFFIC BEARING RING & COVERS. MANHOLES IN UNPAVED AREAS SHALL BE 3" ABOVE

CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A

ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE CITY OF PROVIDENCE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.

# **EROSION CONTROL & SOIL STABILIZATION NOTES:**

- 1. DENUDED SLOPES SHALL NOT BE LEFT EXPOSED FOR EXCESSIVE PERIODS OF TIME.
- 2. ALL DISTURBED SLOPES EITHER NEWLY CREATED OR EXPOSED PRIOR TO OCTOBER 15, SHALL BE SEEDED OR PROTECTED BY THAT DATE FOR ANY WORK COMPLETED DURING EACH CONSTRUCTION YEAR.
- 3. TEMPORARY TREATMENTS SHALL CONSIST OF A HAY, STRAW, OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS A MAT OR FIBER LINING (BURLAP, JUTE, FIBERGLASS NETTING, EXCELSIOR BLANKETS). THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER.
- 4. HAY OR STRAW APPLICATIONS SHOULD BE IN THE AMOUNT OF 2000 LBS/ACRE
- 5. ALL TEMPORARY PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED.
- 6. THE TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSOIL MATERIAL, STONES, ROOTS, LUMPS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS.
- 7. THE SEED MIX SHALL BE INOCULATED WITHIN TWENTY FOUR (24) HOURS, BEFORE MIXING AND PLANTING, WITH APPROPRIATE INOCULUM FOR EACH VARIETY.
- 8. THE CONTRACTOR MUST REPAIR AND/OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE (1) YEAR, AND HE SHALL DO SO AT NO ADDITIONAL EXPENSE.
- 9. THE NORMAL ACCEPTABLE SEASONAL SEEDING DATES ARE APRIL 1ST THROUGH OCTOBER 15TH.
- 10. STABILIZATION OF ONE FORM OR ANOTHER AS DESCRIBED ABOVE SHALL BE ACHIEVED WITHIN FIFTEEN (15) DAYS OF FINAL GRADING.
- 11. STOCKPILES OF TOPSOIL SHALL NOT BE LOCATED NEAR WATERWAYS OR FLOOD PLAINS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN THIRTY PERCENT (30%) AND STOCKPILES SHALL ALSO BE SEEDED AND/OR STABILIZED AND COMPLETELY ENCIRCLED WITH A CONTINUOUS LINE OF SILT SOCK. (SEE DETAIL)

# SEDIMENTATION CONTROL NOTES:

- 1. EXTREME CARE SHALL BE EXERCISED SO AS TO PREVENT ANY SEDIMENTS FROM ENTERING THE CITY HIGHWAY OR ADJOINING PROPERTIES.
- 2. BANKS OR SLOPES OVER 5% SHALL BE SEEDED AS SOON AS POSSIBLE AND SHALL BE PROTECTED WITH A HAY, STRAW OR FIBER MULCH.
- 3. DURING CONSTRUCTION, THE CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
- 4. SEDIMENTATION CONTROL DEVICES SHALL BE INSPECTED CLOSELY AND MAINTAINED PROMPTLY AFTER EACH RAINFALL.
- 5. CARE SHALL BE TAKEN SO AS NOT TO PLACE "REMOVED SEDIMENTS" WITHIN THE PATH OF EXISTING, NEWLY CREATED (BOTH TEMPORARY AND PERMANENT) OR PROPOSED WATERCOURSES OR THOSE AREAS SUBJECTED TO STORM WATER FLOW.
- 6. ADDITIONAL SILT SOCKS SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE ENGINEER.

# SEQUENCE AND STAGING OF LAND DISTURBING **ACTIVITIES:**

- 1. PLACE SEDIMENTATION BARRIERS (SILT SOCK) AS SHOWN ON THE PLANS AND STAKED OUT IN THE FIELD. IN NO CASE IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
- 2. PERFORM TRENCHING AND UTILITY INSTALLATION OPERATIONS. TOP SOIL TO BE STRIPPED AND STOCKPILED IN APPROVED AREAS. THE STOCKPILES ARE TO BE PROTECTED BY A ROW OF SEDIMENTATION BARRIER AND COVERED OR TEMPORARILY SEEDED.
- 3. COMPLETE PERMANENT STABILIZATION. SWEEP THE ROADWAY/PAVED AREAS TO REMOVE ALL SEDIMENTS.
- 4. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS.

# SITE LEGEND

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DESCRIPTION
PROPERTY LINE CENTERLINE (LAYOUT)
STORM DRAIN
ELECTRIC (UNDERGROUND)
FIRE SERVICE FOOTING DRAIN
GAS
OVERHEAD WIRE
SANITARY SEWER
SITE LIGHTING SERVICE
TELEPHONE
WATER
CONTOUR
SPOT GRADE
SPOT GRADE (BOT. OF CURB)
SPOT GRADE (TOP OF CURB)
SPOT GRADE (BOT. OF WALL)
SPOT GRADE (TOP OF WALL) BITUMINOUS CONC. CURB
CAPE COD BERM
PRECAST CONC. CURB
PRECAST SLOPED MOUNT. CURB
SLOPED GRANITE CURB
VERTICAL GRANITE CURB
CHAINLINK FENCE (CLF)
STOCKADE FENCE (STKF)
BORING LOCATION
CATCH BASIN
DOUBLE GRATE CATCH BASIN
CONCRETE THRUST BLOCK
DRAIN MANHOLE
FLARED END STRUCTURE
SEWER MANHOLE
WATER SERVICE
UTILITY POLE
FIRE HYDRANT
GATE VALVE AND CURB BOX
HANDICAP SYMBOL (PRKG. SPACE)
SIGN

SIGN WETLAND SOIL EVALUATION LOCATION TEST PIT LOCATION

FIRE DEPARTMENT CONNECTION

POST INDICATOR VALVE (PIV)

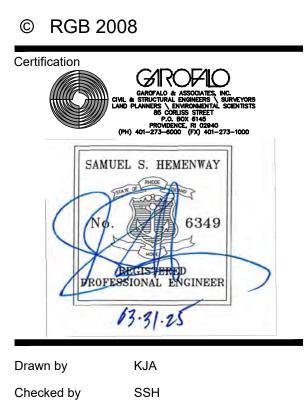
ELECTRIC MANHOLE (EMH) TELEPHONE MANHOLE (TMH) TRANSFORMER PAD GENERATOR PAD GROUND CLEANOUT SIGHT LIGHT POLE TRAFFIC FLOW DIRECTION COMPOST SILT SOCK CONTINUOUS ROW OF SILT FENCE PAVEMENT SAWCUT & MATCH TO EXISTING

# ABBREVIATIONS

CI CLDI CLF CTE D.I. ESHWT ETR EX. F&I	CAST IRON PIPE CEMENT LINED DUCTILE IRON PIPE CHAINLINK FENCE POINT OF CONNECTION TO EXISTING DUCTILE IRON PIPE ESTIMATED SEASONAL HIGH WATER TABLE EXISTING TO REMAIN EXISTING FURNISH AND INSTALL
HDPE	HIGH DENSITY POLYETHYLENE PIPE
INV. NIC	INVERT ELEVATION NOT IN CONTRACT
M.E.	MATCH EXISTING
NTS	NOT TO SCALE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R&D	REMOVE AND DISPOSE
VIF	VERIFY IN FIELD
WQS	WATER QUALITY STRUCTURE

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Revised on

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# Architecture · Project Management · Interior Design

# Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# 155 NIAGARA STREET PROVIDENCE, RI 02907

# Drawing Status **ISSUED FOR** CONSTRUCTION

Issued On 04/02/25

Sheet Contents **GENERAL NOTES &** LEGEND

Project Number

Drawing No.

# STORMWATER SYSTEM MAINTENANCE NOTES:

THE DRAINAGE SYSTEMS ARE TO BE MONITORED THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD BY THE CONTRACTOR. UPON COMPLETION OF THE PROJECT THE CONTRACTOR MUST DO A FINAL FULL MAINTENANCE & CLEAN UP OF THE STORMWATER MANAGEMENT SYSTEM AND THE SITE. UPON COMPLETION OF THE CONTRACTOR'S FINAL MAINTENANCE & CLEAN UP OF THE PROJECT, MONITORING OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE OWNER.

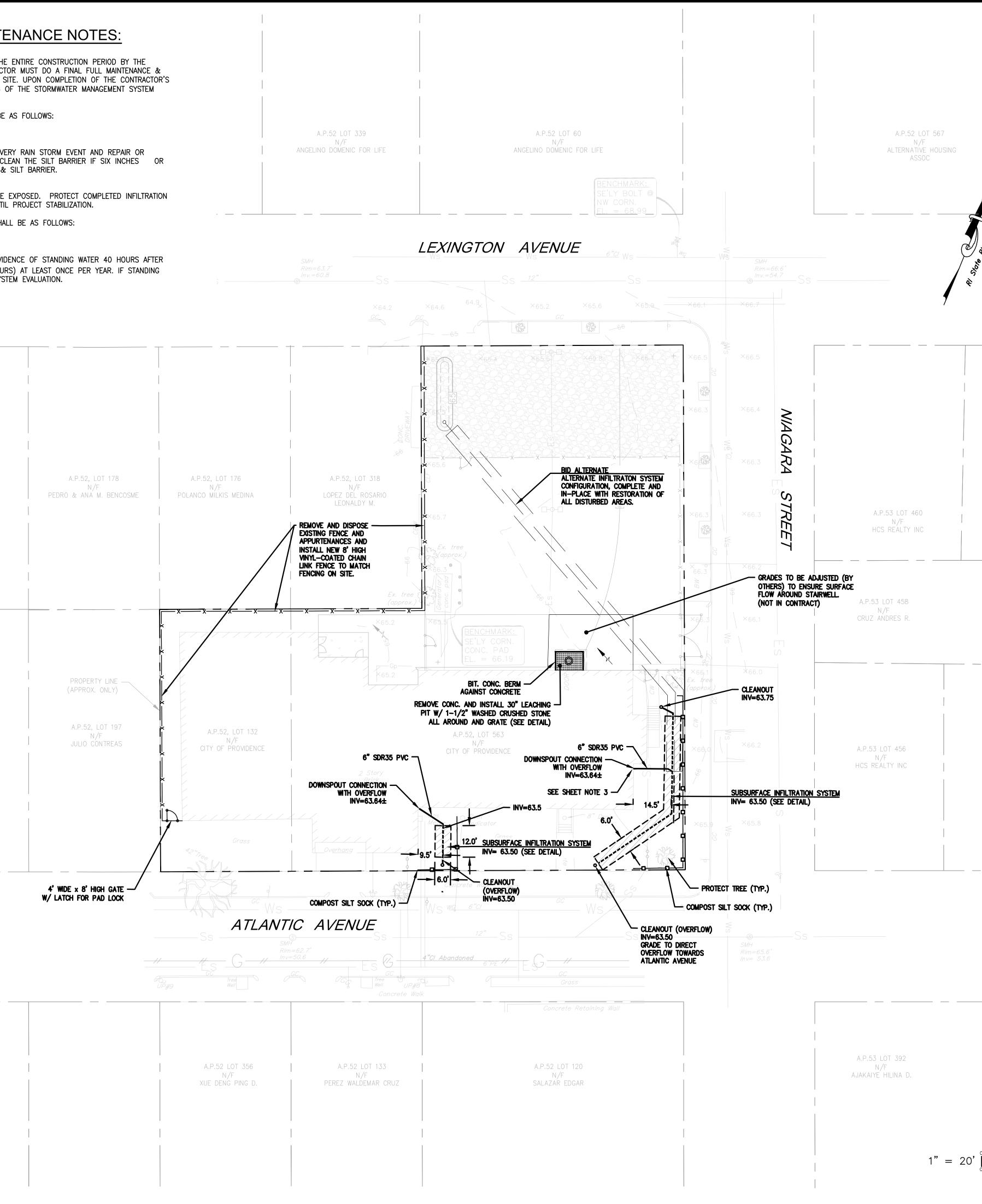
CONSTRUCTION MONITORING/MAINTENANCE PROCEDURES SHALL BE AS FOLLOWS: (RESPONSIBILITY OF CONTRACTOR)

- 1. SILT BARRIER:
- MONITOR SILT BARRIER ON A WEEKLY BASIS AND AFTER EVERY RAIN STORM EVENT AND REPAIR OR REPLACE ANY DAMAGED AREAS IMMEDIATELY. IMMEDIATELY CLEAN THE SILT BARRIER IF SIX INCHES OR MORE OF SEDIMENT HAS ACCUMULATED ON THE HAYBALE & SILT BARRIER.
- 2. STORMWATER MANAGEMENT FACILITIES: PROTECT INFILTRATION TRENCH BOTTOM FROM WATER WHILE EXPOSED. PROTECT COMPLETED INFILTRATION TRENCHES FROM RECEIVING SEDIMENT LAIDEN RUNOFF UNTIL PROJECT STABILIZATION.

POST CONSTRUCTION MONITORING/MAINTENANCE PROCEDURES SHALL BE AS FOLLOWS: (RESPONSIBILITY OF OWNER)

1. STORMWATER MANAGEMENT FACILITIES:

INSPECT PERFORATED PIPE (INFILTRATION TRENCH) FOR EVIDENCE OF STANDING WATER 40 HOURS AFTER A SIGNIFICANT RAINFALL (GREATER THAN  $\frac{1}{2}$ " WITHIN 24-HOURS) AT LEAST ONCE PER YEAR. IF STANDING WATER IS NOTED, CONTACT DESIGN PROFESSIONAL FOR SYSTEM EVALUATION.



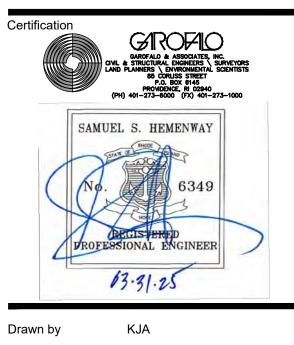
# SHEET NOTES:

- 1. SEE SHEET C-1 FOR GENERAL NOTES & LEGEND.
- 2. THE EXISTING CONDITIONS INDICATED ARE BASED ON DESIGN DRAWINGS AND MAY NOT FULLY REFLECT THE AS-BUILT CONDITIONS. THE SITE CONTRACTOR SHALL VERIFY ALL CONDITIONS PRIOR TO INITIATING ANY WORK AND SHALL NOTIFY OWNER OF ANY DISCREPANCY WHICH IMPACTS CONTRACTED WORK.
- CONTRACTOR SHALL VERIFY THERE ARE NO INTERNAL PLUMBING FIXTURES CONNECTED TO EXISTING ROOF DRAIN PRIOR TO CONNECTING OR INSALLING ANY SUBSURFCE DRAINAGE IMPROVEMENTS.

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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# 155 NIAGARA STREET PROVIDENCE, RI 02907

Drawing Status ISSUED FOR CONSTRUCTION

Issued On 04/02/25

Sheet Contents

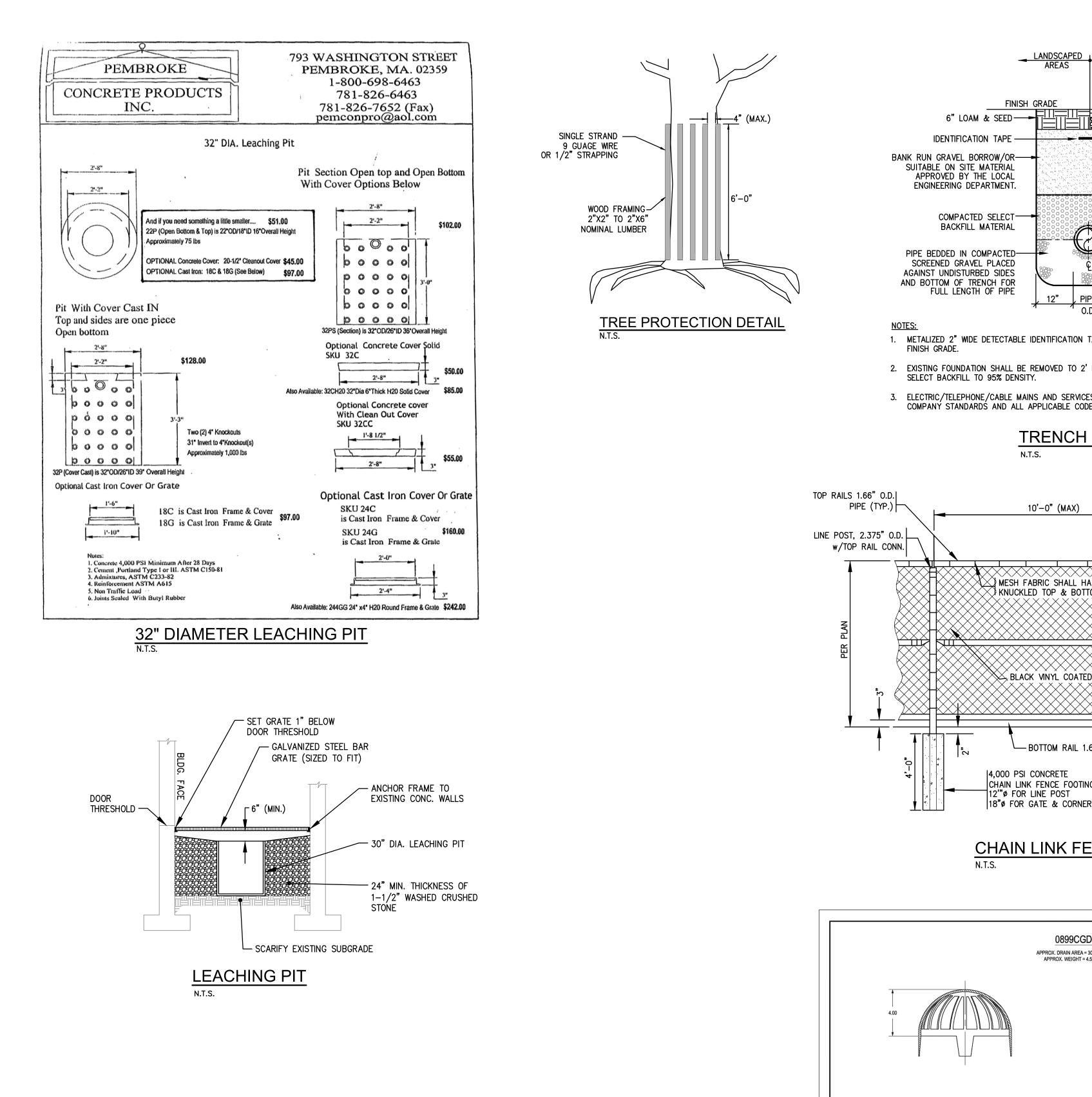
SITE AND UTILITY PLAN

Project Number.

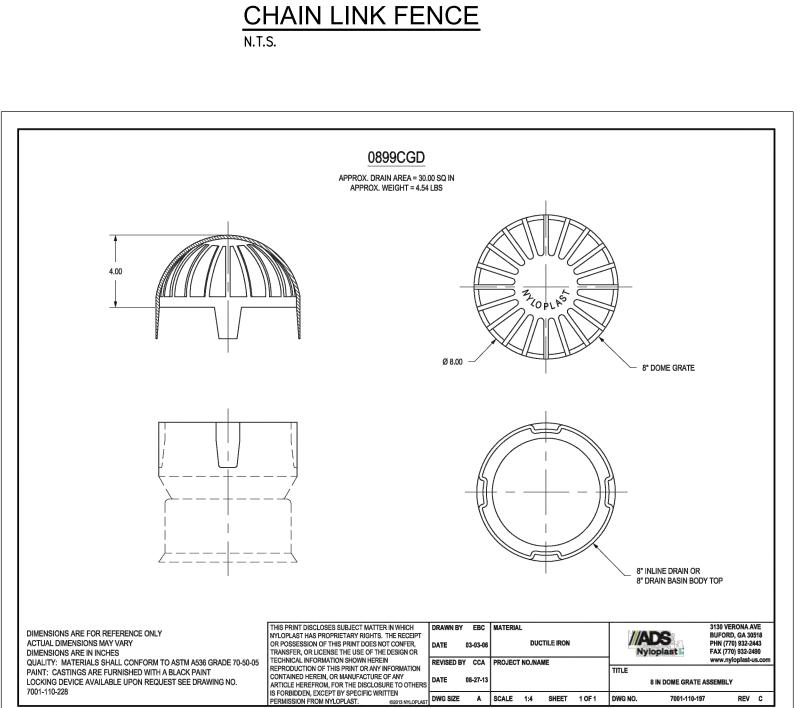
Drawing No.

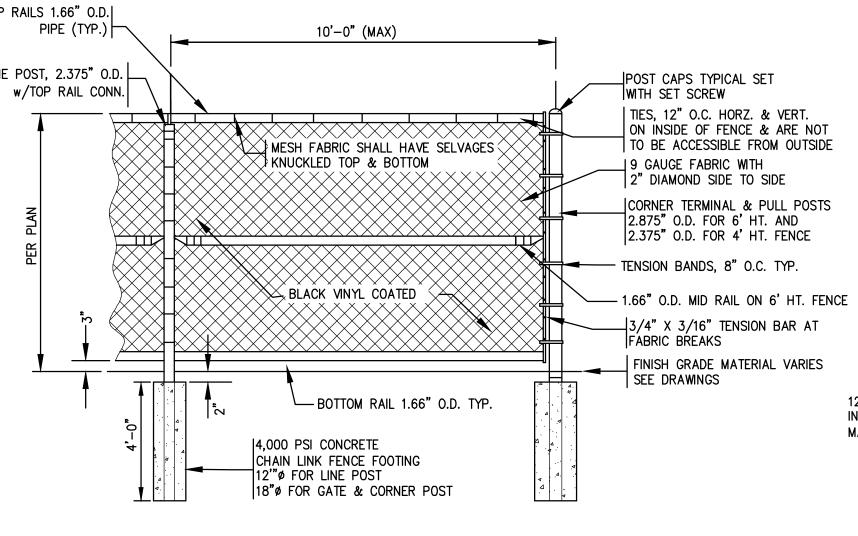
**C-2** 

\_] 30 meters









## **TRENCH SECTION** N.T.S.

- 3. ELECTRIC/TELEPHONE/CABLE MAINS AND SERVICES SHALL BE INSTALLED IN ACCORDANCE WITH UTILITY COMPANÝ STANDARDŚ AND ALL APPLICABLE CODES.
- 2. EXISTING FOUNDATION SHALL BE REMOVED TO 2' MINIMUM BELOW PROPOSED UTILITIES AND BACKFILLED WITH
- 1. METALIZED 2" WIDE DETECTABLE IDENTIFICATION TAPE SHALL BE INSTALLED OVER SEWER LINES 12" BELOW

¢ OF PIPE

PAVED

12"

]1/2 O.D.

VARIES

(6" MIN.)

TRENCH ROCK

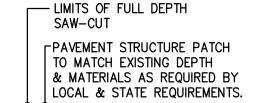
EXCAVATION

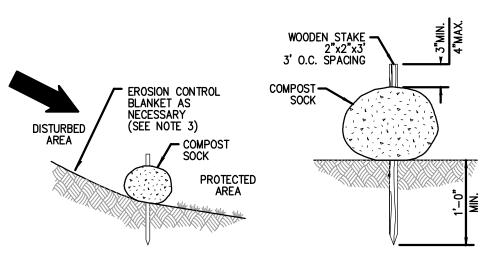
PAYMENT LINE

AREAS

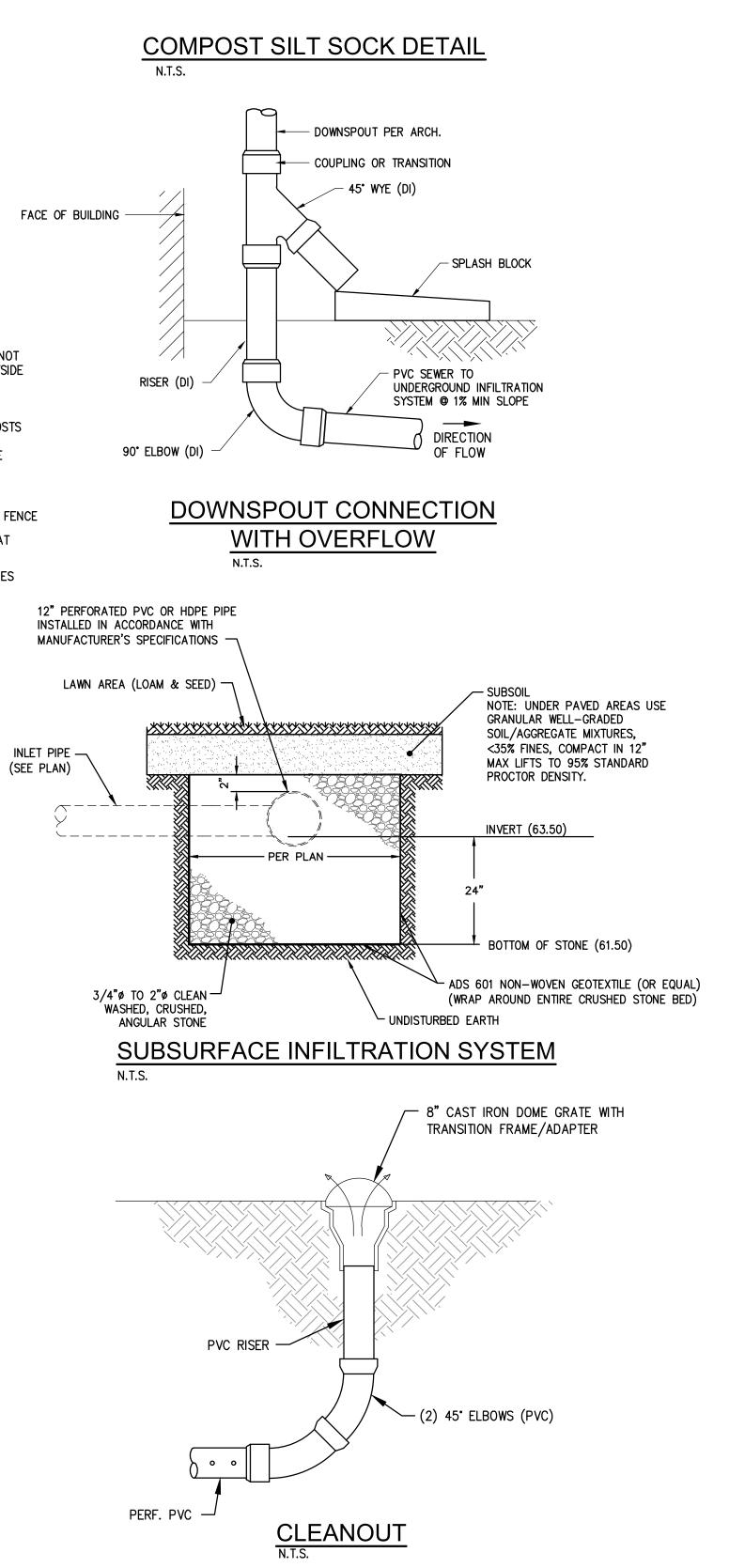
# FACE OF BUILDING

NOTES:





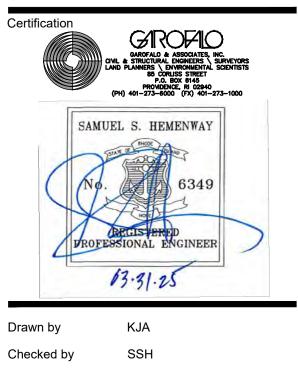
1. COMPOST SOCK SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS. COMPOST SOCK SHALL BE A MINIMUM OF 8" IN DIAMETER. 2. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER. 3. WHEN PLACING COMPOST SOCK ON SLOPES, USE EROSION CONTROL BLANKET IF SPECIFIED ON PLANS. 4. ALWAYS INSTALL COMPOST SOCK PERPENDICULAR TO SLOPE AND ALONG CONTOUR LINES. 5. REMOVE SEDIMENT FROM THE UP SLOPE SIDE OF THE COMPOST SOCK WHEN ACCUMULATION HAS REACHED 1/2 OF THE EFFECTIVE HEIGHT OF THE COMPOST SOCK. 6. SILT FENCE MAY BE SUBSTITUTED WITH OWNER APPROVAL.



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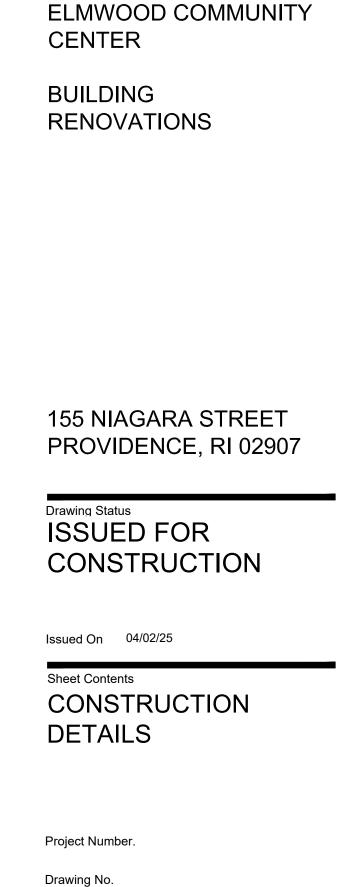
E-mail: rgbinfo@rgb.net

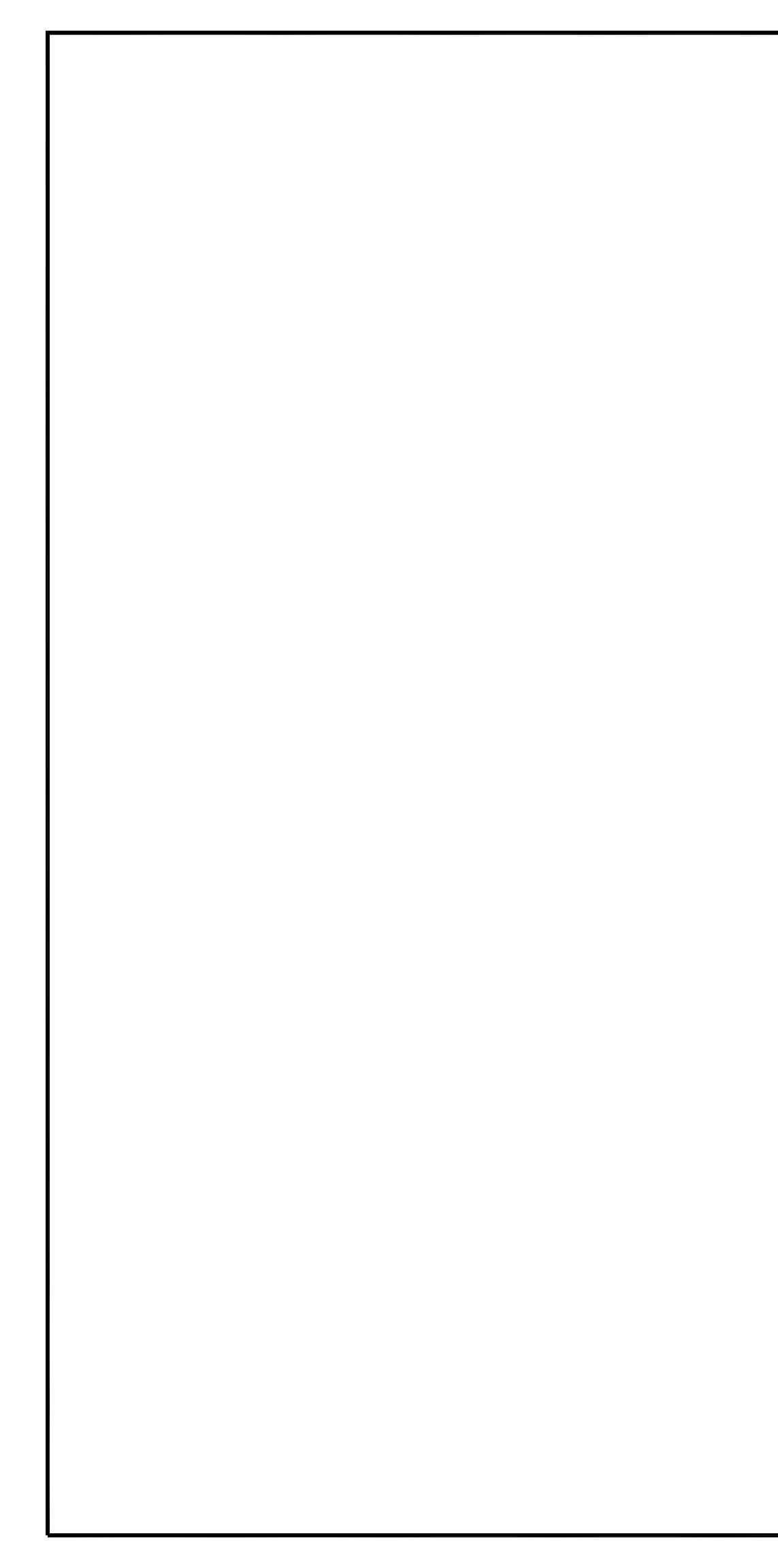
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Proiect

Providence, Rhode Island 02908

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BUILDING & FIRE CODE DATA RHODE ISLAND STATE BUILDING CODES			H. <u>EGRESS REQUIREMENTS</u> 1. LENGTH OF TRAVEL – NFPA 101 SECTION 13.2.6.2 – IBC TABLE 1017.2									
	SBC-01-2021 BUILDING CODE IBC-2018 plus RI Amendment 2022 02 01			ŀ	A3 ASSEMBLY (w/ SPRINKLER SYSTEM) IBC 250 LF							
	RI ACCESSIBILİTY REGULATIONS SBC-1 IBC-2012 Chapter 11; ICC/ANSI A117.1 2009 plus RI Amendments 2010 07 01			2.0	NFPA 101	101 740	250 LF		006.2.1			
	AMERICANS w/ DISABILITIES ACT (ADA - 20				COMMON PATH – NFPA A3 ASSEMBLY (w/ SP		SYSTEM)	SC SECTION,	000.2.1			
	RHDDE ISLAND FIRE SAFETY CDDE (RIFSC - 2018) RHDDE ISLAND FIRE LAWS (RIFL) TITLE 23, CHAPTERS 28.1 - 28.39			3 г	IBC NFPA 101 DEAD END CORRIDOR -		75 LF 75 LF		20.4			
	RULES & REGULATIONS PROMULGATED BY the Bo SECTIONS 1 THRU 15	oard of Appeals &	Review		A3 ASEEMBLY (w/ SP IBC		SYSTEM) 20 LF	0 – IBC , IC	20.4			
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	RHODE ISLAND LIFE SAFETY CODE (RILSC - 2018 NFPA 101-2018 plus RI AMENDMENTS	8)		٢	IUMBER AND WIDTH RE DOOR WIDTH (w/ S		SYSTEM)					
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В.	CONSTRUCTION TYPES & SEPARATION REQUIREMENTS - C	CHAPTER 5			TOTAL WIDTH REQU TOTAL WIDTH PROV					7 IN. REG	UIRED	
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	BUILDING ELEMENT	RATING IN HOURS					LINE LINELU	~· _				
		IBC (table 601) IIIB	NFPA 220 (table 4.1.1) III(200)	J. <u>S</u>	$\frac{\text{TRUCTURAL LOADS}}{\text{WIND SPEED} = [12]}$ $\text{SNOW LOAD} = [30]$	5—138] MI	PH					
	STRUCTURAL FRAME	0	0		SNOW LOAD = $[30]$	] PSF						
	BEARING WALLS EXTERIOR	2	2	К. <u>Е</u>	NERGY CONSERVATION BUILDING ENVELOPE		MENTS & DES	IGN CRITERIA:	OPAQUI	E ASSEMB	LIES	
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	EXTERIOR NON BEARING WALLS AND PARTITIONS	0	0		<u>oofs</u> isulation entirely above	a dack		limate Zone : —25 ci	5	Desi	gn	
	INTERIOR FLOOR CONSTRUCTION INCLUDING	0	0	Ν	letal Buildings (w/ R- ttic and Other	5 thermal	l blocks) R	-19 + R-11 -38	LS	n/a n/a		
	SUPPORTING BEAMS AND JOISTS ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS AND JOISTS	0	0	W	/alls, Above Grade — E	Existing to	Remain					
	DLAWS AND DOISTS				/alls, Below Grade — E	-						
C.	ALLOWABLE AREA AND HEIGHT				loors – Existing to Re	-						
	1. AREA IBC TABLE 506.2 FOR IIIB CONSTRUCTION OCCUPANCY A3	= 28,500 SF/FLOOR			IG FIXTURE ANALYSIS		N IBC chapt	er 29: Table	2902.1:	IPC TABL	E 403.1)	
	2. HEIGHT IBC TABLE 506.2 FOR IIIB CONSTRUCTION			ASSEMB	LY (A3) – BASED ON				249 FEM	1		
		FEET ABOVE GRADE			PLUMBING FIXTURES		CODE REQUIR	FEMALE	TOTAL	PROVID MALE	EMALE UNIS	
	3. AREA AND HEIGHT CALCULATIONS EXISTING BUILDING AREA (NO CHANGE)			1 & 2			2 REQUIRED			5	5	1 11
	FIRST LEVEL SECOND LEVEL	6,884 GSF <u>11,661 GSF</u>			LAVATORIES DRINKING FOUNTAINS		2 REQUIRED	2 REQUIRED	4	5	5	1 11 2
	TOTAL BUILDING AREA EXISTING BUILDING HEIGHT (NO CHANGE)	18,545 GSF 2 STORIES			SERVICE SINK	1			1			1
D.	FIRE RESISTANCE-RATED CONSTRUCTION											
	CORRIDOR FIRE RATING NOT REQUIRED IN ASSEMB EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRI (IBC 2018 TABLE 1020).											
E.	INTERIOR FINISHES ALL INTERIOR FINISHES AT STAIRS, CHAIR LIFT, CO		ARE									
	EXISTING TO REMAIN.											
F.	FIRE PROTECTION											
	<ol> <li>AUTOMATIC FIRE SUPPRESSION – NFPA 13 (EXIS</li> <li>FIRE ALARM SYSTEM (EXISTING TO REMAIN) RI UNIFORM FIRE CODE 13.7 &amp; 13.8 &amp; NFPA 72 CODE REQUIRES A FIRE ALARM SYSTEM.</li> </ol>	,										
G.	OCCUPANCY LOAD TYPES											
	1. OCCUPANCY LOAD TYPES:       IBC TABLE         BUSINESS       150 SF/PERSC	ON GROSS	<u>101 TABLE 7.3.1.2</u> 150 SF/PERSON									
	STORAGE/MECHANICAL 300 SF/PERSC EDUCATION 50 SF/PER ASSEMBLY 15 SF/PER	RSON NET RSON NET	500 SF/PERSON 50 SF/PERSON NET 15 SF/PERSON NET									
	KITCHEN 200 SF/PÉRSO	ON GROSS	100 SF/PERSON									
	2. OCCUPANCY LOAD PER FLOOR <u>AREA</u> FIRST LEVEL	<u>(GROSS)</u>	OCCUPANCY									
	BUSINESS ASSEMBLY	810 GSF 2,079 GSF 684 GSF	8 OCCUPANTS 144 OCCUPANTS									
	STORAGE/MECHANICAL EDUCATION EXERCISE	347 GSF 3,747 GSF	7 OCCUPANTS 7 OCCUPANTS 75 OCCUPANTS									
	KITCHEN 8	<u>487 GSF</u> 8,154 GSF	5 OCCUPANTS 246 OCCUPANTS									
	SECOND_LEVEL BUSINESS ASSEMBLY	466 GSF 3,606 GSF	4 OCCUPANTS 242 OCCUPANTS									
	STORAGE/MECHANICAL	5 <u>68 GSF</u> 4,640 GSF	6 OCCUPANTS 252 OCCUPANTS									
		+,0+0 GSF	202 00001 AN13									
	TOTAL BUILDING OCCUPANTS:	+,0+0 GSF	498 OCCUPANTS									

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Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

155 NIAGARA STREET PROVIDENCE, RI 02907

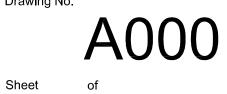
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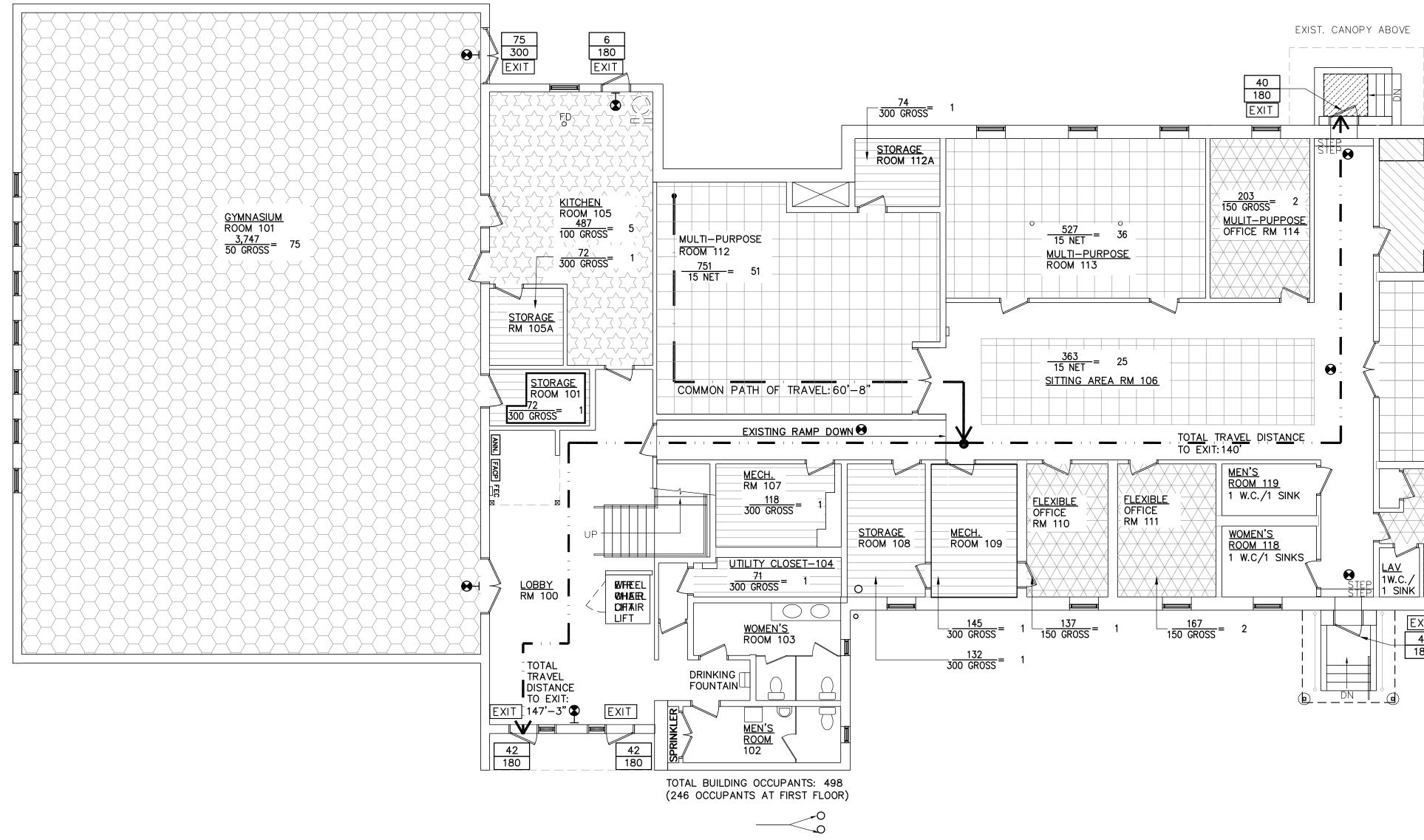
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Sheet Contents CODE REVIEW SUMMARY

Project Number. 6844

Drawing No.

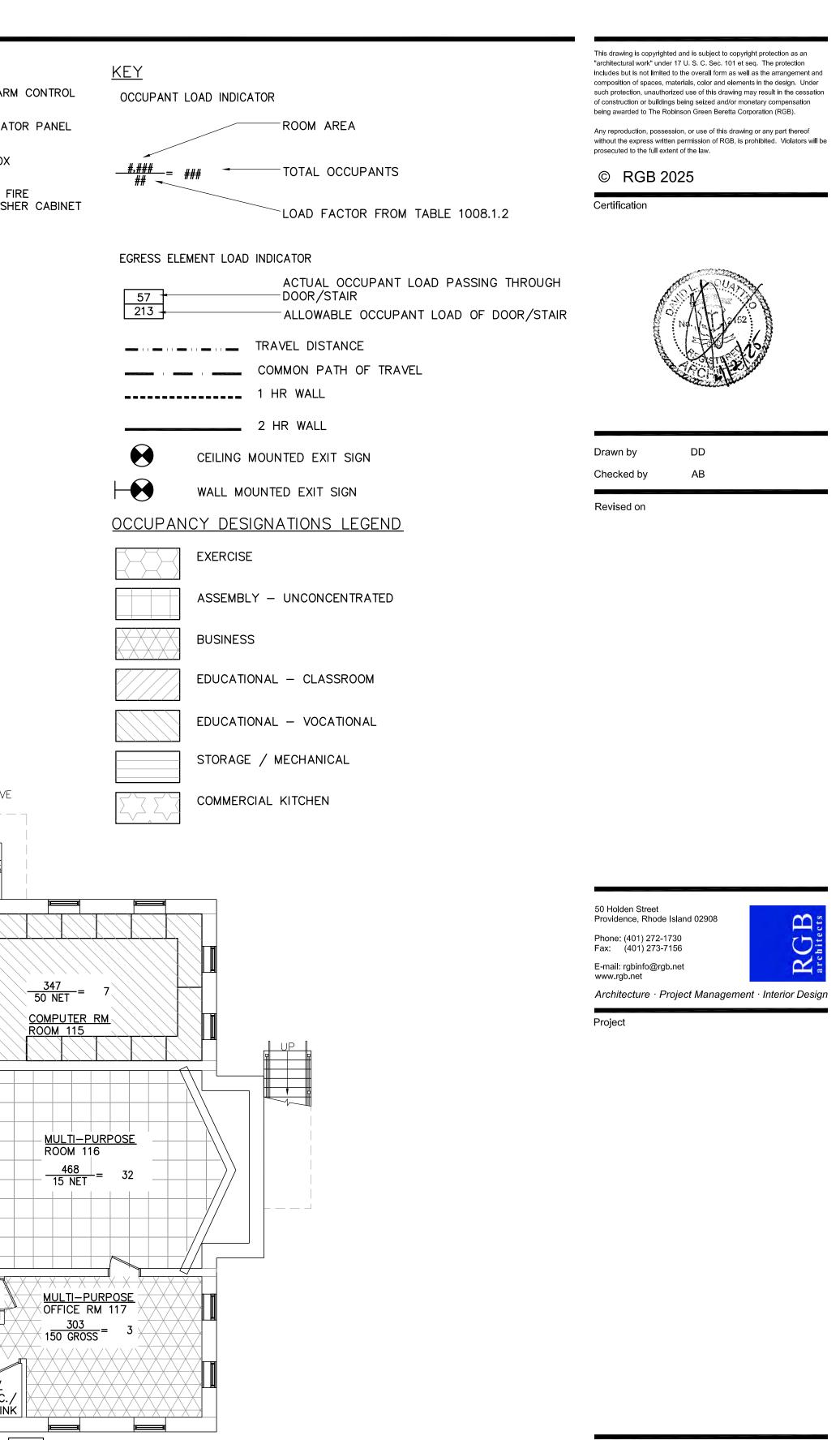






FIRST FLOOR CODE REVIEW A010 SCALE: 1/8" = 1'-0"

D
FIRE ALAR PANEL
ANNUNCIA
ΚΝΟΧ ΒΟΧ
EXISTING F EXTINGUISI



EXIT 41 180

Drawing Status **ISSUED FOR** CONSTRUCTION

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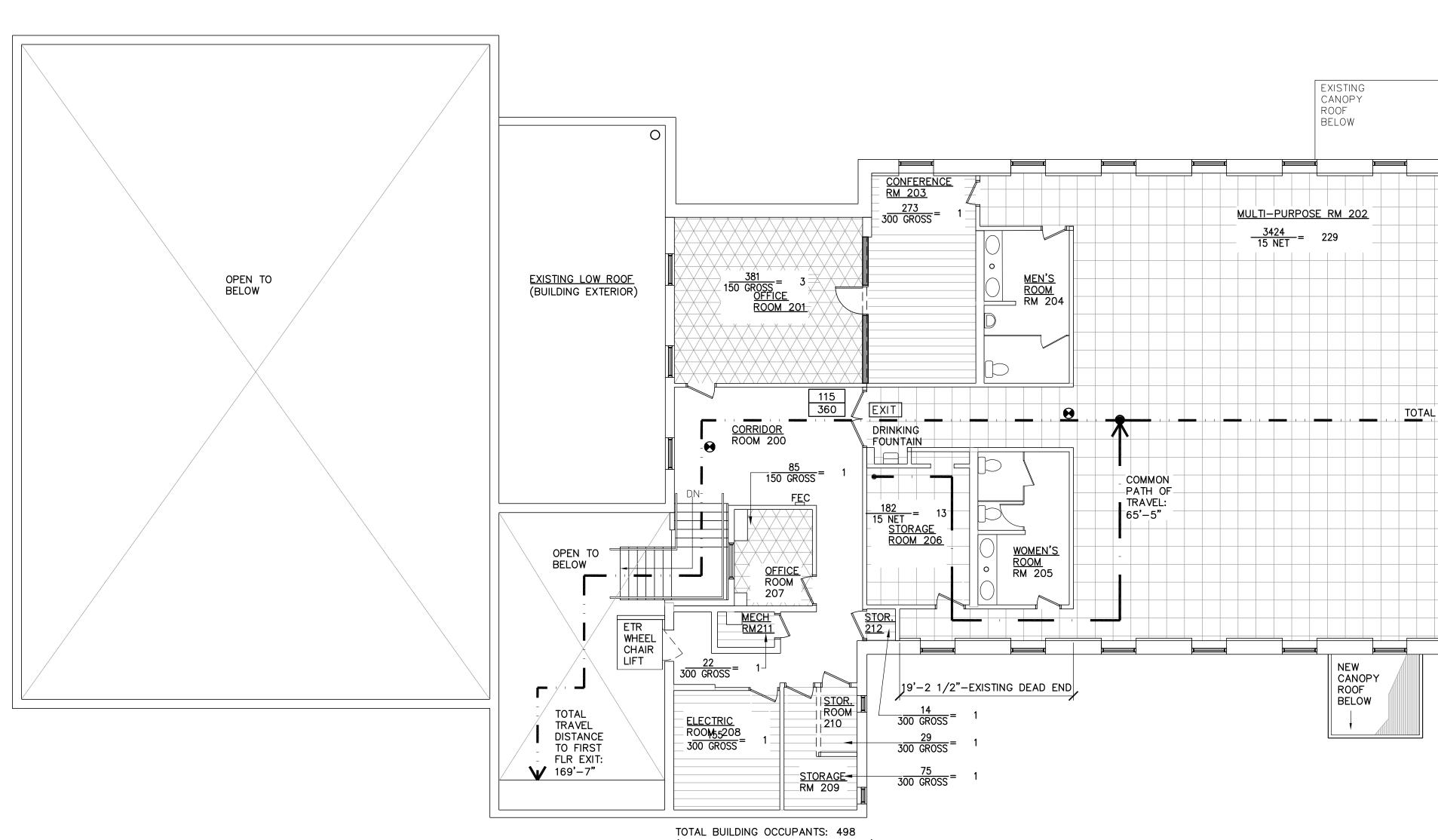
Sheet Contents

CODE REVIEW PLAN

Project Number 6844

Sheet

Drawing No. A010





SECOND FLOOR CODE REVIEW 
 1
 SECONI

 A020
 SCALE: 1/8" = 1'-0"

<u>LEGEN</u>	<u>D</u>
FACP	FIRE ALAR PANEL
ANN.	ANNUNCIA
К	KNOX BOX
FEC	EXISTING F EXTINGUISF

TOTAL BUILDING OCCUPANTS: 498 (252 OCCUPANTS AT SECOND FLOOR)

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TOR PANEL	OCCUPANT LOAD INDICATOR	of construction or buildings being seized and/or monetary compensation being awarded to The Robinson Green Beretta Corporation (RGB).
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	#### = ### TOTAL OCCUPANTS	© RGB 2025
TIRE HER CABINET	LOAD FACTOR FROM TABLE 1008.1.2	Certification
	EGRESS ELEMENT LOAD INDICATOR          57       ACTUAL OCCUPANT LOAD PASSING THROUGH         13       DOOR/STAIR         ALLOWABLE OCCUPANT LOAD OF DOOR/STAIR         TRAVEL DISTANCE         COMMON PATH OF TRAVEL         1 HR WALL	NA CHANNEL CON
	2 HR WALL	Drawn by DD
	CEILING MOUNTED EXIT SIGN	Checked by AB
	WALL MOUNTED EXIT SIGN	Revised on
	OCCUPANCY DESIGNATIONS LEGEND	
	EXERCISE	
	ASSEMBLY – UNCONCENTRATED	
	BUSINESS	
	EDUCATIONAL - CLASSROOM	
	EDUCATIONAL - VOCATIONAL	
	STORAGE / MECHANICAL	
	COMMERCIAL KITCHEN	
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		Project ELMWOOD COMMUNITY CENTER
		BUILDING RENOVATIONS
	CE     TO     EXIT: 125'-5"     115       180     EXIT	

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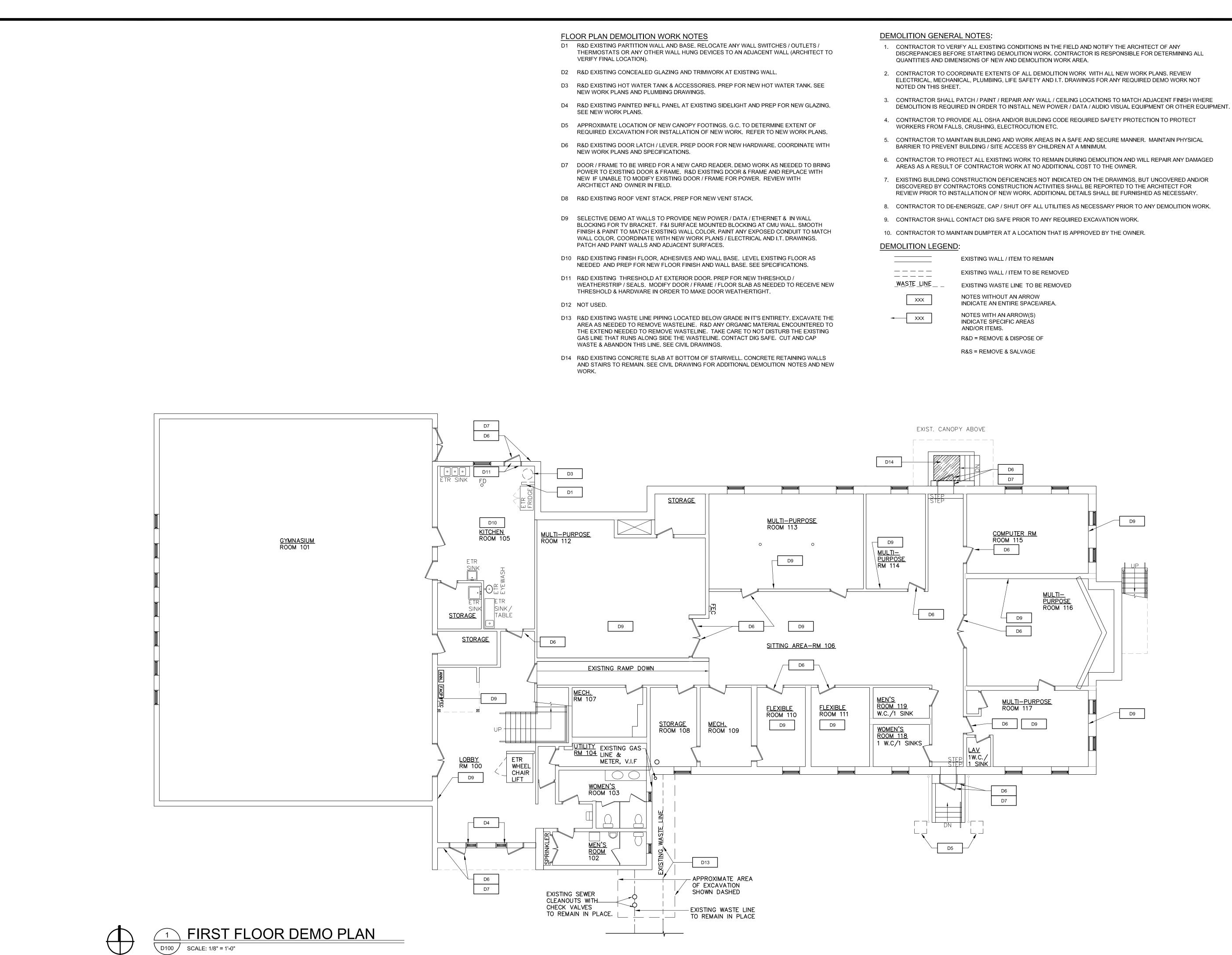
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BUILDING RENOVATIONS

# **155 NIAGARA STREET** PROVIDENCE, RI 02907

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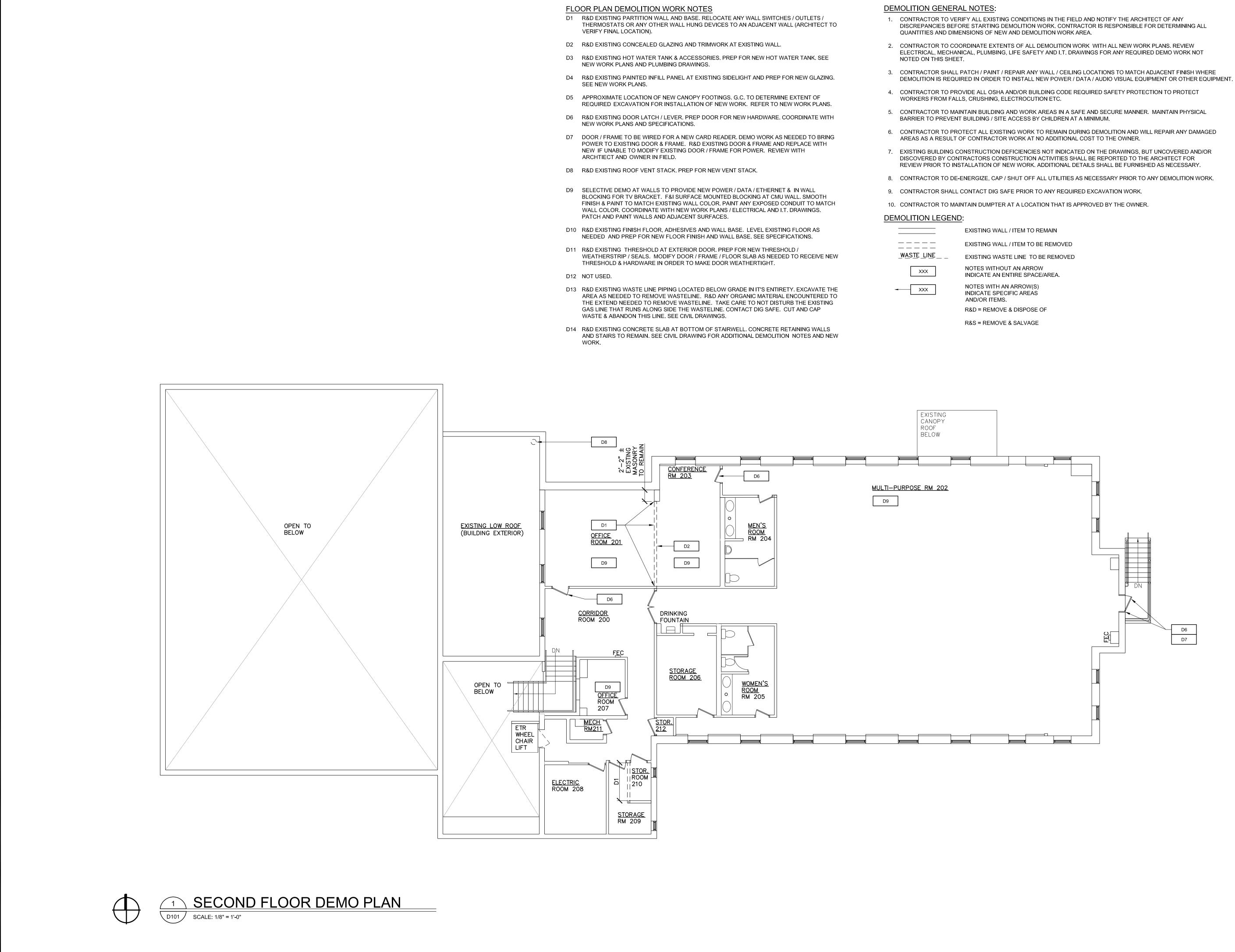
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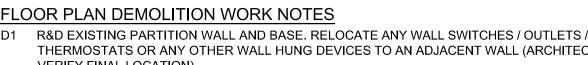
Sheet Contents

FIRST FLOOR DEMO PLAN

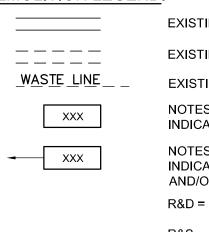
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BUILDING RENOVATIONS

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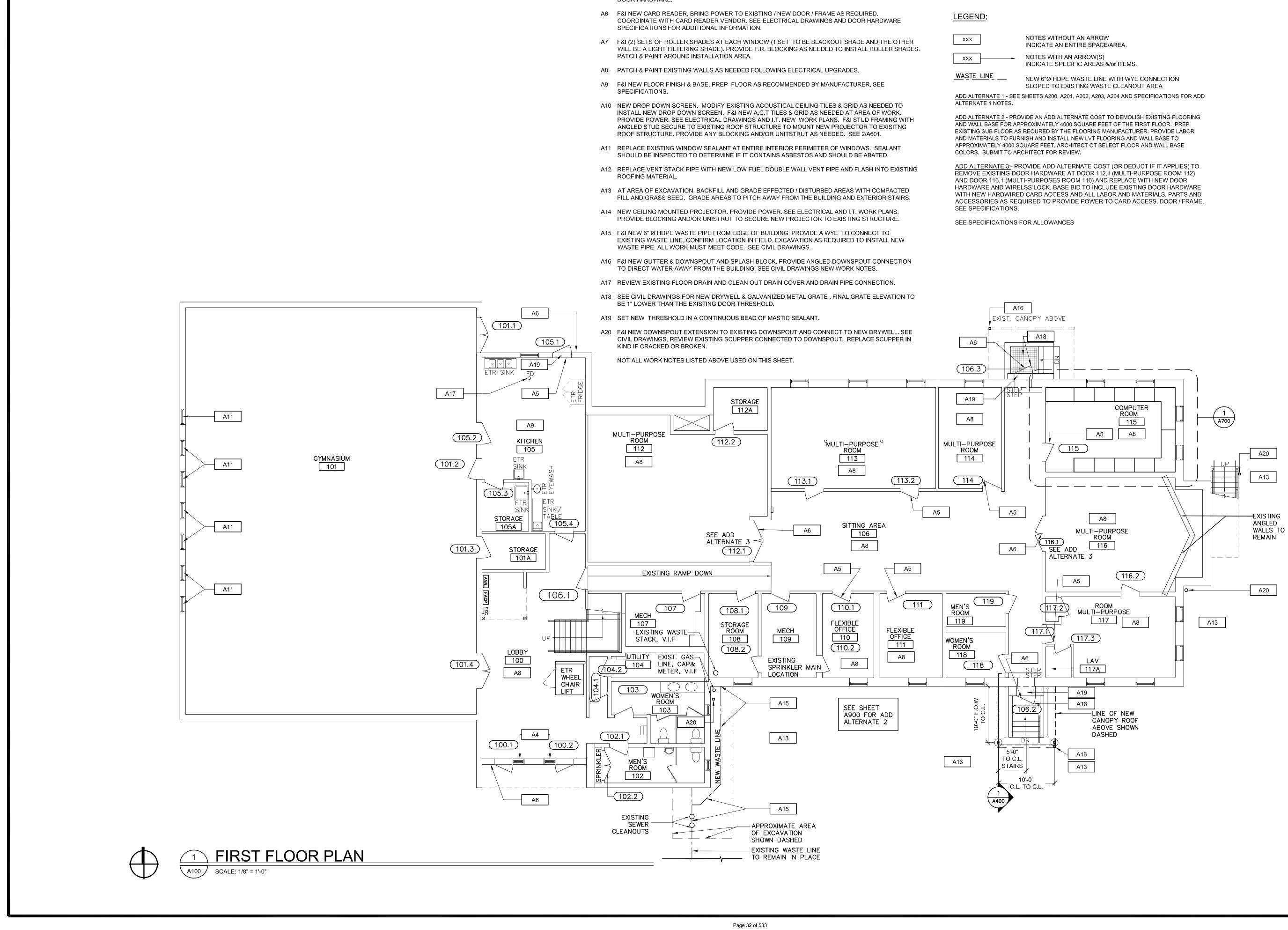
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Sheet Contents SECOND FLOOR DEMO PLAN

Project Number.

Drawing No. D101 Sheet





- A1 F&I NEW VISION PANEL WITH TEMPERED GLASS IN EXISTING WALL OPENING. INSTALL PRIVACY FILM OVER NEW GLAZING. SEE SPECIFICATIONS AND SUBMIT FOR ARCHITECT REVIEW.
- A2 F&I NEW PRIVACY FILM AT DOOR GLAZING. SEE SPECIFICATIONS AND SUBMIT FOR ARCHITECT REVIEW.
- A3 F&I NEW GYPSUM BOARD AT END OF WALL TO CONCEAL STUDS, WATER/WASTE LINES. PRIME & PAINT.
- A4 F&I NEW INSULATED AND TEMPERED GLAZING AT EXISTING SIDELIGHT. INSTALL PRIVACY FILM OVER NEW GLAZING. SEE SPECIFICATIONS FOR PRIVACY FILM AND SUBMIT FOR ARCHITECT REVIEW.
- A5 F&I NEW DOOR HARDWARE AT EXISTING DOOR. SEE DOOR SCHEDULE AND SPECIFICATIONS FOR NEW DOOR HARDWARE.



# **GENERAL NOTES:**

- PRIOR TO ANY NEW WORK.
- ARCHITECTURAL PLANS WITH ELECTRICAL, MECHANICAL, PLUMBING, I.T. AND
- LIFE SAFETY DRAWINGS.
- 5. PROVIDE NEW ADA COMPLIANT SIGNAGE AT ALL INTERIOR DOORS. SEE SPECIFICATIONS.

XXX	NOTES WITH
XXX	NOTES WITH

1. GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN FIELD

2. REVIEW ANY UNFORSEEN CONDITIONS IN FIELD WITH ARCHITECT AND OWNER. 3. COORDINATE NEW WORK PLANS WITH DEMOLITION PLANS. COORDINATE

4. ALL DIMENSIONS TO EXISTING CONSTRUCTION ARE TO FACE OF <u>FINISH</u> U.N.O.

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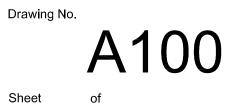
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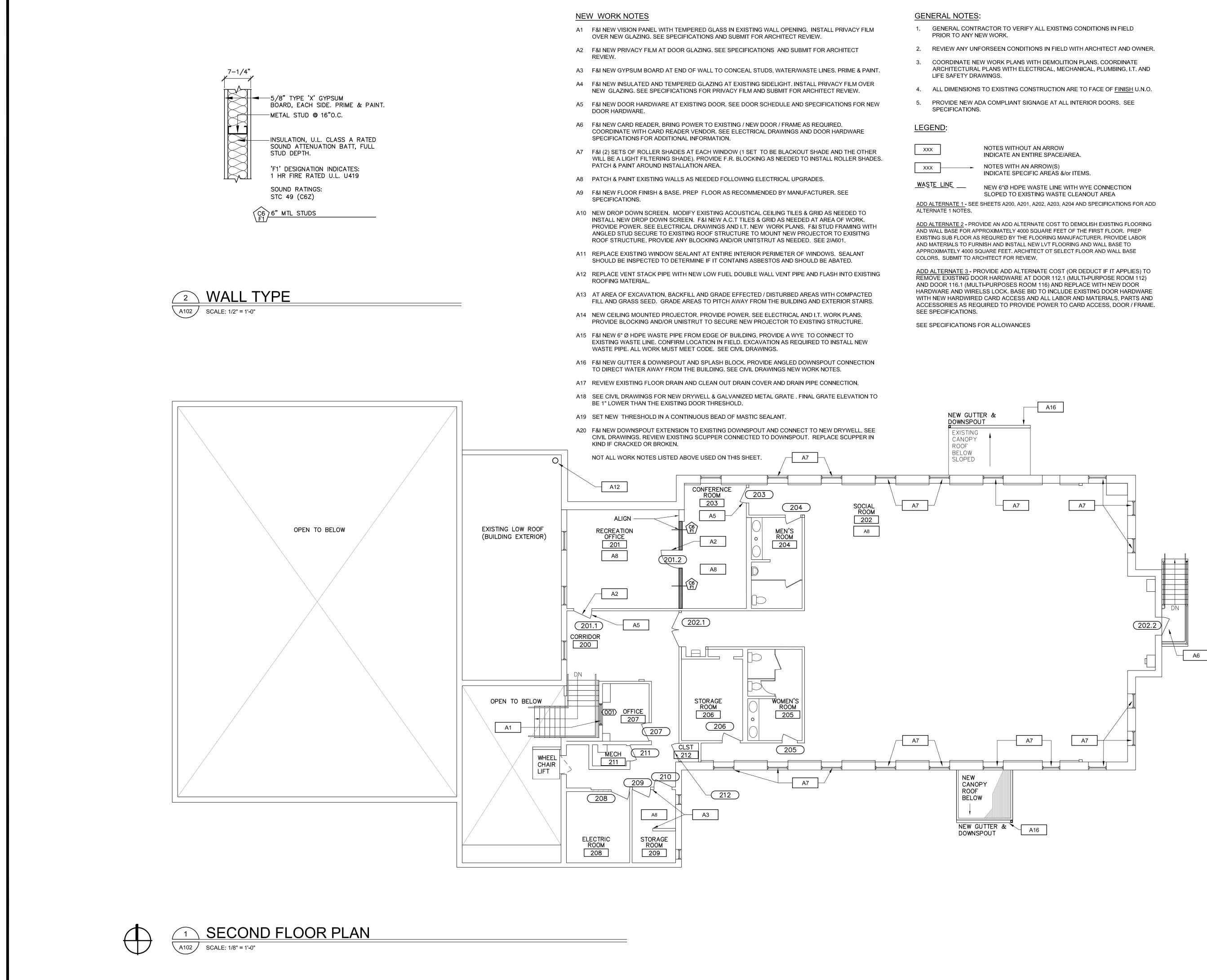
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Sheet Contents

FIRST FLOOR PLAN

Project Number 6844





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Sheet Contents

SECOND FLOOR PLAN

Project Number

Drawing No. A101 Sheet

# DEMOLITION LEGEND:

\_\_\_\_

XXX

\_\_\_\_

---- XXX

EXISTING WALL / ITEM TO REMAIN

EXISTING WALL / ITEM TO BE REMOVED

NOTES WITHOUT AN ARROW INDICATE AN ENTIRE SPACE/AREA.

NOTES WITH AN ARROW(S) INDICATE SPECIFIC AREAS AND/OR ITEMS. R&D = REMOVE & DISPOSE OF

R&S = REMOVE & SALVAGE

APPROXIMATE AREA OF EXISTING MURAL, PAINT RESTORATION ALLOWANCE THESE LOCATIONS

EXISTING BRICK, SEE NEW WORK NOTES

HATCH OVERLAY DENOTES APPROXIMATE AREA OF MASONRY IS TO BE REPOINTED

EXISTING STACK BOND CMU SEE WORK NOTES

EXISTING PAINTED PRECAST CMU, SIZE VARIES

EXISTING PLYWOOD / INFILL PANEL TO REMAIN

PLYWOOD / INFILL PANEL TO BE REMOVED

BRICK TO BE WASHED WITH MASONRY CLEANER& BRUSHED CLEAN

AREA OF MASONRY IS TO BE **REPOINTED & CLEANED** 

GENERAL NOTES: 1. CONTRACTOR TO NOTIFY THE ARCH WORK. CONTRACT

QUANTITIES AND I 2. CONTRACTOR SHA LOCATIONS TO MA

3. CONTRACTOR TO SAFETY PROTECT WORKERS FROM I

4. CONTRACTOR TO SECURE MANNER BARRIER TO PREV MINIMUM.

5. CONTRACTOR TO REPAIR ANY DAMA AREAS AS A RESU TO THE OWNER.

6. EXISTING BUILDING THE DRAWINGS, B DISCOVERED BY C **REPORTED TO TH REVIEW PRIOR TO** SHALL BE FURNIS

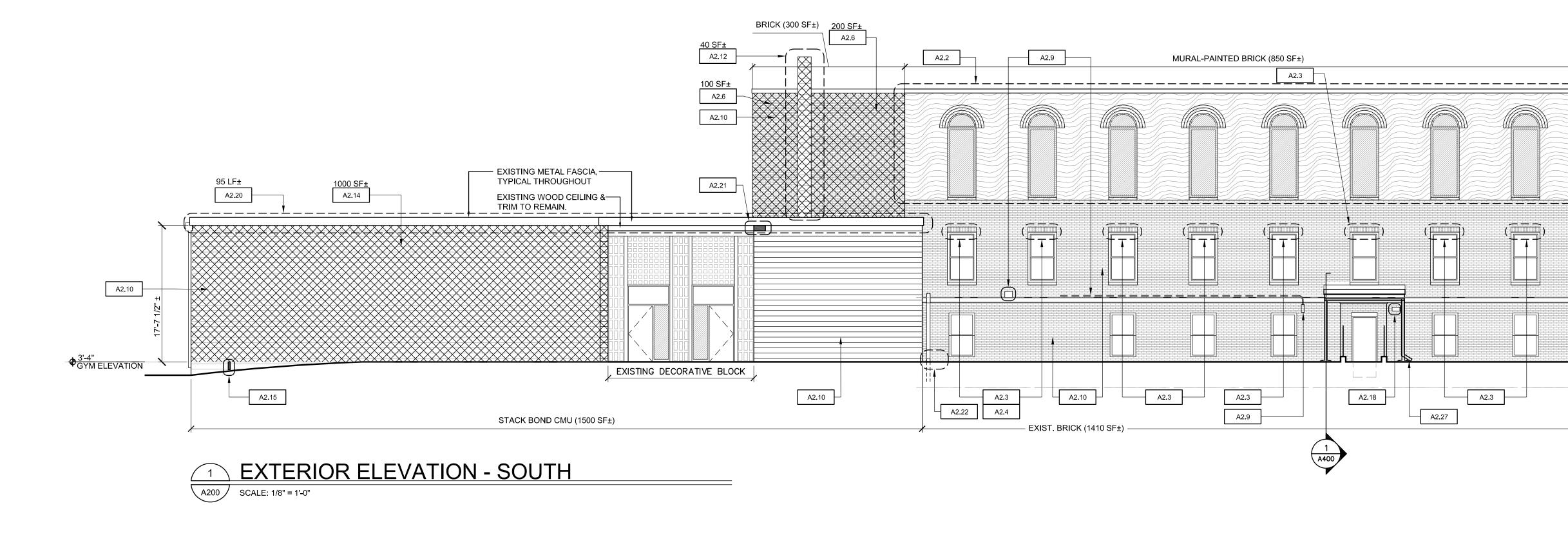
7. CONTRACTOR TO NECESSARY PRIO

8. CONTRACTOR SH EXCAVATION WORK

9. CONTRACTOR TO APPROVED BY TH

ADD ALTERNATE 1: INCLUDE ADD ALTERNA WASH ALL NON PAINTE WORK THAT IS NOT PAIL

NOTE: SEE SPECIFICATIONS F



Е	NERAL NOTES:	ELEVA	ATIONS AND EXTERIOR WORK NOTES	
1.	CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING ANY WORK. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL	A2.1	ARCHED CONCRETE HEADER / KEYSTONE: FILL JOINTS BETWEEN HEADER AND ADJACENT BRICK WITH MORTAR. MATCH EXISTING MORTAR COLOR, TYPICAL.	A2.21
2.	QUANTITIES AND DIMENSIONS OF NEW AND DEMOLITION WORK AREA. CONTRACTOR SHALL PATCH / PAINT / REPAIR ANY WALL / SURFACE LOCATIONS TO MATCH ADJACENT FINISH / EXISTING	A2.2	MISSING MORTAR JOINTS AT MURAL / PAINTED BRICK: ± 20% OF AREA AT EACH ELEVATION (AREAS THAT ARE DARKER THAN ADJACENT PAINT COLOR INDICATE MISSING MORTAR JOINT) - GRIND OUT EXISTING PAINT AND MORTAR JOINT AND INFILL WITH NEW MORTAR. PAINT AFFECTED BRICK AND MORTAR AREA TO MATCH EXISTING PAINT COLOR. PAINT RESTORATION ALLOWANCE AT LOCATIONS WHERE MURAL / ARTWORK NEEDS REPAINTING.	A2.22
3.	PAINT COLOR IN LOCATIONS WHERE DEMOLITION IS REQUIRED. CONTRACTOR TO PROVIDE ALL OSHA AND/OR BUILDING CODE REQUIRED SAFETY PROTECTION REQUIRED TO PROTECT	A2.3	<u>SOLDER COURSE BRICK HEADERS:</u> REPOINT ALL BRICK HEADERS. CUT OUT JOINTS AND INFILL JOINTS WITH NEW MORTAR. MATCH EXISTING MORTAR COLOR. 48" APPROXIMATE WINDOW	A2.23
4.	WORKERS FROM FALLS, CRUSHING, ELECTROCUTION ETC. CONTRACTOR TO MAINTAIN BUILDING AND WORK AREAS IN A SAFE AND	A2.4	OPENING. <u>STEEL WINDOW LINTELS:</u> R&D EXISTING STEEL WINDOW LINTEL THAT IS CORRODED & REPLACE	A2.24
	SECURE MANNER. MAINTAIN PHYSICAL BARRIER TO PREVENT BUILDING / SITE ACCESS BY CHILDREN AT A MINIMUM.		WITH A NEW GALVINIZED STEEL LINTEL TO MATCH EXISTING SIZE, GUAGE AND CONFIGURATION. NEW LINTEL TO BE INSTALLED IN THE LOCATION OF EXISTING LINTEL WITH EXACT BEARING POINTS. REMOVE BRICK SOLDER COURSE HEADER AND BRICK ABOVE AS NEEDED TO REPLACE THE	A2.25
5.	CONTRACTOR TO PROTECT ALL EXISTING WORK TO REMAIN AND WILL REPAIR ANY DAMAGED		LINTEL. RESET BRICKS AND ADD NEW MORTAR TO MATCH EXISTING MORTAR COLOR. SEE DETAILS 5/A500 AND 6/A500.	A2.26
	AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.	A2.5	FILL CRACK IN MASONRY UNITS AND MORTAR. FILL MORTAR JOINTS WITH AN OPENING OF $\frac{1}{8}$ " OR GREATER. MORTAR COLOR TO MATCH EXISTING.	A2.27
3.	EXISTING BUILDING CONSTRUCTION DEFICIENCIES NOT INDICATED ON THE DRAWINGS, BUT UNCOVERED AND/OR DISCOVERED BY CONTRACTORS CONSTRUCTION ACTIVITIES SHALL BE	A2.6	REPOINT EXISTING BRICK. CUT OUT ANY DAMAGED MORTAR. NEW MORTAR COLOR TO MATCH EXISTING. FILL CRACLS WITH MORTAR TO MATCH EXISTING MORTAR COLOR.	A2.28
	REPORTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF NEW WORK. ADDITIONAL DETAILS SHALL BE FURNISHED AS NECESSARY.	A2.7	CLEAN BRICK WINDOW SILLS. CUT OUT MORTAR JOINTS AND REPOINT WITH MORTAR TO MATCH EXISTING.	A2.20
7.	CONTRACTOR TO DE-ENERGIZE, CAP / SHUT OFF ALL UTILITIES AS NECESSARY PRIOR TO ANY DEMOLITION WORK.	A2.8	<u>BRICK TO PRECAST CMU JOINT:</u> CUT OUT EXISTING VERTICAL JOINT FROM CONCRETE BAND UP TO ROOF FASCIA, REPLACE WITH NEW SOFT JOINT (FILLED WITH SEALANT) EACH SIDE. APPROXIMATELY ± 70 LINEAR FEET TOTAL.	A2.29
3.	CONTRACTOR SHALL CONTACT DIG SAFE PRIOR TO ANY REQUIRED EXCAVATION WORK.	A2.9	R&D EXISTING LIGHT FIXTURES / ELECTRICAL BOXES / CONDUITS & WIRING NO LONGER IN USE. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR.	
	CONTRACTOR TO MAINTAIN DUMPTER AT A LOCATION THAT IS APPROVED BY THE OWNER.	A2.10	R&D EXISTING NAILS / CLIPS PROTRUDING OUT OF A MASONRY UNIT OR MASONRY MORTAR JOINT. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR. TYPICAL ALL ELEVATIONS.	
CL	<u>) ALTERNATE 1:</u> LUDE ADD ALTERNATE COST FOR LABOR AND MATERIALS TO PRESSURE SH ALL NON PAINTED BRICK AND THEN F&I A SEALER FOR ALL BRICK	A2.11	R&D EXISTING PLYWOOD CONCEALING WINDOW. R&D NAILS USED TO SECURE PLYWOOD TO MASONRYAND PLUG HOLES WITH MORTAR. MORTAR COLOR TO MATCH EXISING.	
	RK THAT IS NOT PAINTED (TYPICAL ENTIRE BUILDING). 	A2.12	REPOINT EXISTING MASONRY CHIMNEY. REPLACE ANY DAMAGED / DETERIORATING FLASHING.	
<u>) T</u> EE	E: SPECIFICATIONS FOR ALTERNATES & ALLOWANCES	A2.13	R&D EXISTING ABANDONED EXHAUST VENT AND INFILL HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR.	
		A2.14	<u>CMU STACK BOND BLOCK:</u> GRIND OUT EXISTING PAINT. CUT OUT VERTICAL MORTAR JOINTS AND REPOINT WITH NEW MORTAR. TYPICAL AT ENTIRE ELEVATION. PRIME & PAINT CMU BLOCK. ARCHITECT TO SELECT PAINT COLOR.	
		A2.15	FILL 12" HIGH CRACK AT THE FOUNDATION WITH EPOXY.	
		A2.16	<u>CMU TO CMU JOINT:</u> CUT OUT ENTIRE MORTAR JOINT AND REPLACE WITH NEW MORTAR JOINT. UP TO UNDERSIDE OF FASCIA / FLASHING. ± 18 LINEAR FEET.	
		A2.17	INSTALL DYMONIC PRIMER URETHANE SEALANT AT ENTIRE RIGHT SIDE TO SEAL OPENING.	
		A2.18	R&D INSULATION & DEBRIS AT EXTERIOR VENT. REVEW TO ENSURE VENT/ DUCT IS OPERATIONAL AND FUNCTIONING PROPERLY. INSTALL NEW RODENT PROOF EXTERIOR GRILL / VENT COVER AT EXTERIOR.	
		A2.19	WASH BRICK AND MORTAR JOINTS ALREADY REPOINTED WITH PROSCO 600 MND80 MASONRY CLEANER AND BRUSH THE AREA CLEAN.	
		A2.20	REVIEW EXISITNG ALUMINUM FASCIA. INSTALL NON-SHRINKING GROUT FORMED AT AT 45° ANGLE BENEATH LOWER EDGE OF EXISTING FASCIA AND EXISTING EXTERIOR WALL TO PROPERLY SHED WATER AWAY FROM THE BUILDING.	

REMOVE EXISTING WOOD TRIM THAT IS LIFTING AWAY FROM THE BUIILDING AND REPLACE WITH NEW BORAL TRIM, CUT TO SIZE. PAINT TO MATCH EXISTING PAINT COLOR. APPROXIMATE SIZE 8" X 12". G.C. TO CONFIRM ACTUAL DIMENSIONS IN FIELD.

R&D EXISTING HORIZONTAL DOWNSPOUT EXTENSION THAT TRANSVERSE GRADE. ADD NEW BOOT DOWNSPOUT EXTENSION TO CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWING

ADD ANGLED DOWNSPOUT EXTENSION TO EXISTING DOWNSPOUT SO THAT IT CLEAR STAIR TREAD. ADD NEW BOOT AND CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWINGS.

REPLACE EXISTING ROOF VENT STACK WITH NEW LOW FUEL DOUBLE WALL VENT PIPE. PROVIDE FLASHING AT INTERSECTION OF NEW PIPE AND EXISTING ROOFING MATERIAL.

PLUG OPENING AROUND CONDENSATE LINE WITH MORTAR TO MATCH EXISTING.

R&D MASONRY AT DOOR OPENING ALREADY INFILLED (AND SURROUNDING AREA). EXISTING JOINTS ARE CRACKED, MASONRY COLOR DOES NOT MATCH AND JOINTS DO NOT ALIGN. F&I NEW BRICK & MORTAR TO MATCH ADJACENT BRICK WORK. ALIGN NEW MASONRY WITH ADJACENT MASONY ON SECOND FLOOR SOUTH ELEVATION.

F&I NEW GUTTER, DOWNSPOUT AND SPLASH BLOCK. COORDINATE WITH CIVIL DRAWINGS AND DRYWELL LOCATIONS.

AT EXISTING FOOTING / COLUMN CONNECTION AT REAR CANOPY: CUT DOWN EXISTING ANCHOR BOLT SCREW ENDS SO THAT THEY ARE NO GREATER THAN  $\frac{1}{2}$ " HIGH ABOVE THE EXISTING BOLTS. TYPICAL EACH COLUMN).

REVIEW EXISTING ROOF SCUPPER FOR LEAKS. F&I NEW ROOF SCUPPER TO MATCH EXISTING. SEALL ALL AREAS TO PREVENT FUTURE & PRESENT LEAKS.

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Project ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# A2.2 ( | | | | | | | | € \$11'-7.5" SECOND FLOOR ● ELEV. VARIES GRADE

A2.22

A2.3

₱ ₱ GIRST FLOOR

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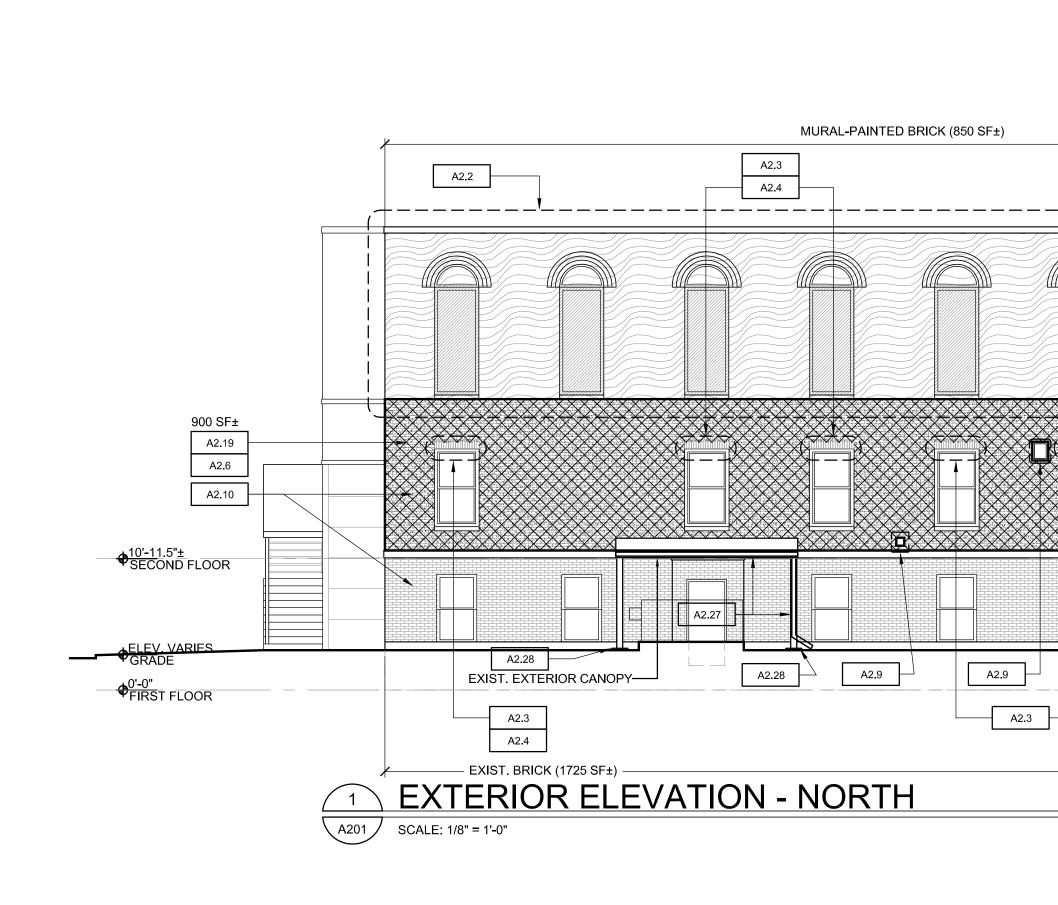
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Sheet Contents

EXTERIOR ELEVATION

Project Number 684

Drawing No. A200 Sheet



**DEMOLITION LEGEND:** \_\_\_\_\_

DEMOLITION LEC	<u>GEND</u> :	<u>GENERAL NOTES</u> :		TIONS AND EXTERIOR W ARCHED CONCRETE HEADER
	EXISTING WALL / ITEM TO REMAIN	<ol> <li>CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING ANY WORK. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL</li> </ol>	A2.1	WITH MORTAR. MATCH EXIST
	EXISTING WALL / ITEM TO BE REMOVED	QUANTITIES AND DIMENSIONS OF NEW AND DEMOLITION WORK AREA.	A2.2	MISSING MORTAR JOINTS AT
XXX	NOTES WITHOUT AN ARROW INDICATE AN ENTIRE SPACE/AREA. NOTES WITH AN ARROW(S)	<ol> <li>CONTRACTOR SHALL PATCH / PAINT / REPAIR ANY WALL / SURFACE LOCATIONS TO MATCH ADJACENT FINISH / EXISTING PAINT COLOR IN LOCATIONS WHERE DEMOLITION IS REQUIRED.</li> </ol>		GRIND OUT EXISTING PAINT A BRICK AND MORTAR AREA TC ALLOWANCE AT LOCATIONS \
- XXX	INDICATE SPECIFIC AREAS AND/OR ITEMS. R&D = REMOVE & DISPOSE OF	3. CONTRACTOR TO PROVIDE ALL OSHA AND/OR BUILDING CODE REQUIRED SAFETY PROTECTION REQUIRED TO PROTECT WORKERS FROM FALLS, CRUSHING, ELECTROCUTION ETC.	A2.3	SOLDER COURSE BRICK HEAI JOINTS WITH NEW MORTAR. N OPENING.
	R&S = REMOVE & SALVAGE	4. CONTRACTOR TO MAINTAIN BUILDING AND WORK AREAS IN A SAFE AND SECURE MANNER. MAINTAIN PHYSICAL	A2.4	<u>STEEL WINDOW LINTELS:</u> R&E WITH A NEW GALVINIZED STE
	APPROXIMATE AREA OF EXISTING MURAL, PAINT RESTORATION	BARRIER TO PREVENT BUILDING / SITE ACCESS BY CHILDREN AT A MINIMUM.		NEW LINTEL TO BE INSTALLEI REMOVE BRICK SOLDER COU LINTEL. RESET BRICKS AND A
	ALLOWANCE THESE LOCATIONS EXISTING BRICK,	5. CONTRACTOR TO PROTECT ALL EXISTING WORK TO REMAIN AND WILL REPAIR ANY DAMAGED		5/A500 AND 6/A500.
	SEE NEW WORK NOTES	AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.	A2.5	FILL CRACK IN MASONRY UNI GREATER. MORTAR COLOR T
	HATCH OVERLAY DENOTES APPROXIMATE AREA OF MASONRY IS TO BE REPOINTED	6. EXISTING BUILDING CONSTRUCTION DEFICIENCIES NOT INDICATED ON THE DRAWINGS, BUT UNCOVERED AND/OR	A2.6	REPOINT EXISTING BRICK. CL EXISTING. FILL CRACLS WITH
	EXISTING STACK BOND CMU	DISCOVERED BY CONTRACTORS CONSTRUCTION ACTIVITIES SHALL BE REPORTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF NEW WORK. ADDITIONAL DETAILS	A2.7	CLEAN BRICK WINDOW SILLS EXISTING.
	SEE WORK NOTES	SHALL BE FURNISHED AS NECESSARY. 7. CONTRACTOR TO DE-ENERGIZE, CAP / SHUT OFF ALL UTILITIES AS	A2.8	BRICK TO PRECAST CMU JOIN ROOF FASCIA, REPLACE WITH
	EXISTING PAINTED PRECAST CMU, SIZE VARIES	NECESSARY PRIOR TO ANY DEMOLITION WORK.	40.0	APPROXIMATELY ± 70 LINEAR
	EXISTING PLYWOOD / INFILL	8. CONTRACTOR SHALL CONTACT DIG SAFE PRIOR TO ANY REQUIRED EXCAVATION WORK.	A2.9	R&D EXISTING LIGHT FIXTURE PLUG ANY REMAINING HOLES
	PANEL TO REMAIN	<ol> <li>CONTRACTOR TO MAINTAIN DUMPTER AT A LOCATION THAT IS APPROVED BY THE OWNER.</li> <li>ADD ALTERNATE 1:</li> </ol>	A2.10	R&D EXISTING NAILS / CLIPS F PLUG ANY REMAINING HOLES ELEVATIONS.
	PLYWOOD / INFILL PANEL TO BE REMOVED	INCLUDE ADD ALTERNATE COST FOR LABOR AND MATERIALS TO PRESSURE WASH ALL NON PAINTED BRICK AND THEN F&I A SEALER FOR ALL BRICK	A2.11	R&D EXISTING PLYWOOD CON MASONRYAND PLUG HOLES V
	BRICK TO BE WASHED WITH MASONRY CLEANER& BRUSHED	WORK THAT IS NOT PAINTED (TYPICAL ENTIRE BUILDING).	A2.12	REPOINT EXISTING MASONRY
	CLEAN	SEE SPECIFICATIONS FOR ALTERNATES & ALLOWANCES	A2.13	R&D EXISTING ABANDONED E MORTAR COLOR.
	AREA OF MASONRY IS TO BE REPOINTED & CLEANED		A2.14	CMU STACK BOND BLOCK: GF REPOINT WITH NEW MORTAR ARCHITECT TO SELECT PAINT
			A2.15	FILL 12" HIGH CRACK AT THE
			A2.16	<u>CMU TO CMU JOINT:</u> CUT OUT UP TO UNDERSIDE OF FASCIA
			A2.17	INSTALL DYMONIC PRIMER UP
			A2.18	R&D INSULATION & DEBRIS A AND FUNCTIONING PROPERL EXTERIOR.
			A2.19	WASH BRICK AND MORTAR JO CLEANER AND BRUSH THE AF
			A2.20	REVIEW EXISITNG ALUMINUM BENEATH LOWER EDGE OF E WATER AWAY FROM THE BUIL
			A2.21	REMOVE EXISTING WOOD TR NEW BORAL TRIM, CUT TO SIZ APPROXIMATE SIZE 8" X 12".
			A2.22	R&D EXISTING HORIZONTAL E DOWNSPOUT EXTENSTION TO CIVIL DRAWING
			A2.23	ADD ANGLED DOWNSPOUT E ADD NEW BOOT AND CONNEC DRAWINGS.
			A2.24	REPLACE EXISTING ROOF VE FLASHING AT INTERSECTION
			A2.25	PLUG OPENING AROUND CON
) SF±)		EXISTING BRICK (670 SF±)	A2.26	R&D MASONRY AT DOOR OPE ARE CRACKED, MASONRY CO MORTAR TO MATCH ADJACEN SECOND FLOOR SOUTH ELEV
		10 SF±	A2.27	F&I NEW GUTTER, DOWNSPO DRYWELL LOCATIONS.
		A2.12	A2.28	AT EXISTING FOOTING / COLL BOLT SCREW ENDS SO THAT TYPICAL EACH COLUMN).
		310 SF±. FOR PRICING	A2.29	, REVIEW EXISTING ROOF SCU SEALL ALL AREAS TO PREVEN
		ASSUME 20% OF AREA TO BE REPOINTED		SEALL ALL AREAS TO FREVER
XXXXXXXXXX				
A2.9				

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A2.10

A2.11

A2.10

STACK BOND CMU (1300 SF±)

A2.3

## ELEVATIONS AND EXTERIOR WORK NOTES

<u>ER / KEYSTONE:</u> FILL JOINTS BETWEEN HEADER AND ADJACENT BRICK STING MORTAR COLOR, TYPICAL.

T MURAL / PAINTED BRICK: ± 20% OF AREA AT EACH ELEVATION THAN ADJACENT PAINT COLOR INDICATE MISSING MORTAR JOINT) -AND MORTAR JOINT AND INFILL WITH NEW MORTAR. PAINT AFFECTED TO MATCH EXISTING PAINT COLOR. PAINT RESTORATION S WHERE MURAL / ARTWORK NEEDS REPAINTING.

EADERS: REPOINT ALL BRICK HEADERS. CUT OUT JOINTS AND INFILL R. MATCH EXISTING MORTAR COLOR. 48" APPROXIMATE WINDOW

&D EXISTING STEEL WINDOW LINTEL THAT IS CORRODED & REPLACE TEEL LINTEL TO MATCH EXISTING SIZE, GUAGE AND CONFIGURATION. LED IN THE LOCATION OF EXISTING LINTEL WITH EXACT BEARING POINTS. OURSE HEADER AND BRICK ABOVE AS NEEDED TO REPLACE THE D ADD NEW MORTAR TO MATCH EXISTING MORTAR COLOR. SEE DETAILS

INITS AND MORTAR. FILL MORTAR JOINTS WITH AN OPENING OF 🗄 OR TO MATCH EXISTING.

CUT OUT ANY DAMAGED MORTAR. NEW MORTAR COLOR TO MATCH TH MORTAR TO MATCH EXISTING MORTAR COLOR.

LS. CUT OUT MORTAR JOINTS AND REPOINT WITH MORTAR TO MATCH

<u>DINT:</u> CUT OUT EXISTING VERTICAL JOINT FROM CONCRETE BAND UP TO ITH NEW SOFT JOINT (FILLED WITH SEALANT) EACH SIDE. AR FEET TOTAL.

IRES / ELECTRICAL BOXES / CONDUITS & WIRING NO LONGER IN USE. ES WITH MORTAR. MATCH EXISTING MORTAR COLOR.

S PROTRUDING OUT OF A MASONRY UNIT OR MASONRY MORTAR JOINT. ES WITH MORTAR. MATCH EXISTING MORTAR COLOR. TYPICAL ALL

CONCEALING WINDOW. R&D NAILS USED TO SECURE PLYWOOD TO S WITH MORTAR. MORTAR COLOR TO MATCH EXISING.

IRY CHIMNEY. REPLACE ANY DAMAGED / DETERIORATING FLASHING. D EXHAUST VENT AND INFILL HOLES WITH MORTAR. MATCH EXISTING

GRIND OUT EXISTING PAINT. CUT OUT VERTICAL MORTAR JOINTS AND AR. TYPICAL AT ENTIRE ELEVATION. PRIME & PAINT CMU BLOCK. INT COLOR.

HE FOUNDATION WITH EPOXY.

UT ENTIRE MORTAR JOINT AND REPLACE WITH NEW MORTAR JOINT. CIA / FLASHING. ± 18 LINEAR FEET.

URETHANE SEALANT AT ENTIRE RIGHT SIDE TO SEAL OPENING.

AT EXTERIOR VENT. REVEW TO ENSURE VENT/ DUCT IS OPERATIONAL RLY. INSTALL NEW RODENT PROOF EXTERIOR GRILL / VENT COVER AT

CONTS ALREADY REPOINTED WITH PROSCO 600 MND80 MASONRY AREA CLEAN.

JM FASCIA. INSTALL NON-SHRINKING GROUT FORMED AT AT 45° ANGLE EXISTING FASCIA AND EXISTING EXTERIOR WALL TO PROPERLY SHED UILDING.

RIM THAT IS LIFTING AWAY FROM THE BUILDING AND REPLACE WITH SIZE. PAINT TO MATCH EXISTING PAINT COLOR. ". G.C. TO CONFIRM ACTUAL DIMENSIONS IN FIELD.

DOWNSPOUT EXTENSION THAT TRANSVERSE GRADE. ADD NEW BOOT TO CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE

EXTENSION TO EXISTING DOWNSPOUT SO THAT IT CLEAR STAIR TREAD. NECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL

VENT STACK WITH NEW LOW FUEL DOUBLE WALL VENT PIPE. PROVIDE ON OF NEW PIPE AND EXISTING ROOFING MATERIAL.

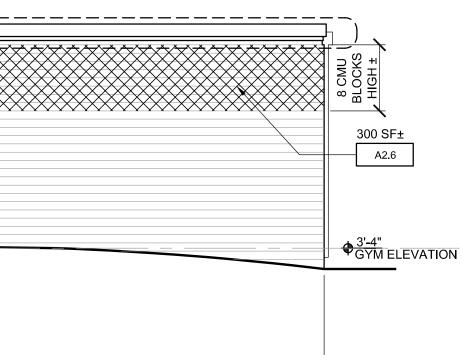
ONDENSATE LINE WITH MORTAR TO MATCH EXISTING.

PENING ALREADY INFILLED (AND SURROUNDING AREA). EXISTING JOINTS COLOR DOES NOT MATCH AND JOINTS DO NOT ALIGN. F&I NEW BRICK & ENT BRICK WORK. ALIGN NEW MASONRY WITH ADJACENT MASONY ON EVATION.

POUT AND SPLASH BLOCK. COORDINATE WITH CIVIL DRAWINGS AND

DLUMN CONNECTION AT REAR CANOPY: CUT DOWN EXISTING ANCHOR AT THEY ARE NO GREATER THAN  $\frac{1}{2}$ " HIGH ABOVE THE EXISTING BOLTS.

CUPPER FOR LEAKS. F&I NEW ROOF SCUPPER TO MATCH EXISTING. /ENT FUTURE & PRESENT LEAKS.



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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# 155 NIAGARA STREET PROVIDENCE, RI 02907

# Drawing Status **ISSUED FOR** CONSTRUCTION

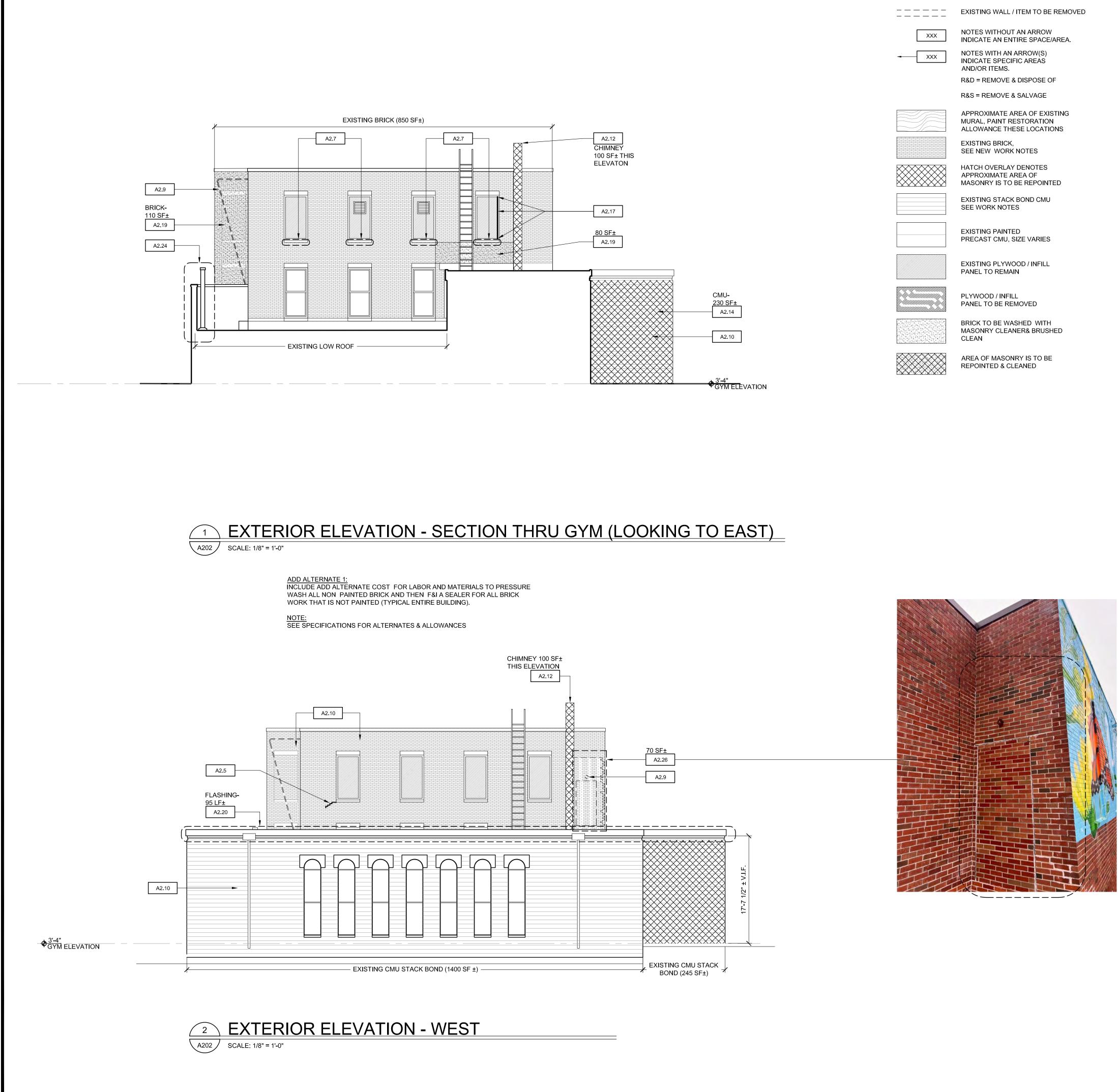
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Sheet Contents

# EXTERIOR ELEVATION

Project Number. 6844

Drawing No. A20<sup>-</sup>



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A2.29

## **GENERAL NOTES:**

MINIMUM.

6.

A2.1

A2.2

A2.3

A2.4

A2.5

A2.6

A2.7

A2.8

A2.9

A2.10

A2.11

A2.12

A2.13

A2.14

A2.15

A2.16

A2.17

A2.19

A2.20

A2.21

A2.22

DEMOLITION LEGEND:

**EXISTING WALL / ITEM TO REMAIN** 

CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING ANY WORK. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL QUANTITIES AND DIMENSIONS OF NEW AND DEMOLITION WORK AREA.

2. CONTRACTOR SHALL PATCH / PAINT / REPAIR ANY WALL / SURFACE LOCATIONS TO MATCH ADJACENT FINISH / EXISTING PAINT COLOR IN LOCATIONS WHERE DEMOLITION IS REQUIRED.

3. CONTRACTOR TO PROVIDE ALL OSHA AND/OR BUILDING CODE REQUIRED SAFETY PROTECTION REQUIRED TO PROTECT WORKERS FROM FALLS, CRUSHING, ELECTROCUTION ETC.

4. CONTRACTOR TO MAINTAIN BUILDING AND WORK AREAS IN A SAFE AND SECURE MANNER. MAINTAIN PHYSICAL BARRIER TO PREVENT BUILDING / SITE ACCESS BY CHILDREN AT A

5. CONTRACTOR TO PROTECT ALL EXISTING WORK TO REMAIN AND WILL REPAIR ANY DAMAGED AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.

EXISTING BUILDING CONSTRUCTION DEFICIENCIES NOT INDICATED ON THE DRAWINGS, BUT UNCOVERED AND/OR DISCOVERED BY CONTRACTORS CONSTRUCTION ACTIVITIES SHALL BE REPORTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF NEW WORK. ADDITIONAL DETAILS SHALL BE FURNISHED AS NECESSARY.

7. CONTRACTOR TO DE-ENERGIZE, CAP / SHUT OFF ALL UTILITIES AS NECESSARY PRIOR TO ANY DEMOLITION WORK.

8. CONTRACTOR SHALL CONTACT DIG SAFE PRIOR TO ANY REQUIRED EXCAVATION WORK.

9. CONTRACTOR TO MAINTAIN DUMPTER AT A LOCATION THAT IS

APPROVED BY THE OWNER. ELEVATIONS AND EXTERIOR WORK NOTES

> ARCHED CONCRETE HEADER / KEYSTONE: FILL JOINTS BETWEEN HEADER AND ADJACENT BRICK WITH MORTAR. MATCH EXISTING MORTAR COLOR, TYPICAL.

> MISSING MORTAR JOINTS AT MURAL / PAINTED BRICK: ± 20% OF AREA AT EACH ELEVATION (AREAS THAT ARE DARKER THAN ADJACENT PAINT COLOR INDICATE MISSING MORTAR JOINT) -GRIND OUT EXISTING PAINT AND MORTAR JOINT AND INFILL WITH NEW MORTAR. PAINT AFFECTED BRICK AND MORTAR AREA TO MATCH EXISTING PAINT COLOR. PAINT RESTORATION ALLOWANCE AT LOCATIONS WHERE MURAL / ARTWORK NEEDS REPAINTING.

SOLDER COURSE BRICK HEADERS: REPOINT ALL BRICK HEADERS. CUT OUT JOINTS AND INFILL JOINTS WITH NEW MORTAR. MATCH EXISTING MORTAR COLOR. 48" APPROXIMATE WINDOW OPENING.

STEEL WINDOW LINTELS: R&D EXISTING STEEL WINDOW LINTEL THAT IS CORRODED & REPLACE WITH A NEW GALVINIZED STEEL LINTEL TO MATCH EXISTING SIZE, GUAGE AND CONFIGURATION. NEW LINTEL TO BE INSTALLED IN THE LOCATION OF EXISTING LINTEL WITH EXACT BEARING POINTS. REMOVE BRICK SOLDER COURSE HEADER AND BRICK ABOVE AS NEEDED TO REPLACE THE LINTEL. RESET BRICKS AND ADD NEW MORTAR TO MATCH EXISTING MORTAR COLOR. SEE DETAILS 5/A500 AND 6/A500.

FILL CRACK IN MASONRY UNITS AND MORTAR. FILL MORTAR JOINTS WITH AN OPENING OF  $\frac{1}{8}$ " OR GREATER. MORTAR COLOR TO MATCH EXISTING.

REPOINT EXISTING BRICK. CUT OUT ANY DAMAGED MORTAR. NEW MORTAR COLOR TO MATCH EXISTING. FILL CRACLS WITH MORTAR TO MATCH EXISTING MORTAR COLOR.

CLEAN BRICK WINDOW SILLS. CUT OUT MORTAR JOINTS AND REPOINT WITH MORTAR TO MATCH EXISTING.

BRICK TO PRECAST CMU JOINT: CUT OUT EXISTING VERTICAL JOINT FROM CONCRETE BAND UP TO ROOF FASCIA, REPLACE WITH NEW SOFT JOINT (FILLED WITH SEALANT) EACH SIDE. APPROXIMATELY ± 70 LINEAR FEET TOTAL.

R&D EXISTING LIGHT FIXTURES / ELECTRICAL BOXES / CONDUITS & WIRING NO LONGER IN USE. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR

R&D EXISTING NAILS / CLIPS PROTRUDING OUT OF A MASONRY UNIT OR MASONRY MORTAR JOINT. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR. TYPICAL ALL ELEVATIONS.

R&D EXISTING PLYWOOD CONCEALING WINDOW. R&D NAILS USED TO SECURE PLYWOOD TO MASONRYAND PLUG HOLES WITH MORTAR. MORTAR COLOR TO MATCH EXISING.

REPOINT EXISTING MASONRY CHIMNEY. REPLACE ANY DAMAGED / DETERIORATING FLASHING. R&D EXISTING ABANDONED EXHAUST VENT AND INFILL HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR.

CMU STACK BOND BLOCK: GRIND OUT EXISTING PAINT. CUT OUT VERTICAL MORTAR JOINTS AND REPOINT WITH NEW MORTAR. TYPICAL AT ENTIRE ELEVATION. PRIME & PAINT CMU BLOCK. ARCHITECT TO SELECT PAINT COLOR.

FILL 12" HIGH CRACK AT THE FOUNDATION WITH EPOXY.

CMU TO CMU JOINT: CUT OUT ENTIRE MORTAR JOINT AND REPLACE WITH NEW MORTAR JOINT. UP TO UNDERSIDE OF FASCIA / FLASHING. ± 18 LINEAR FEET.

INSTALL DYMONIC PRIMER URETHANE SEALANT AT ENTIRE RIGHT SIDE TO SEAL OPENING.

R&D INSULATION & DEBRIS AT EXTERIOR VENT. REVEW TO ENSURE VENT/ DUCT IS OPERATIONAL AND FUNCTIONING PROPERLY. INSTALL NEW RODENT PROOF EXTERIOR GRILL / VENT COVER AT EXTERIOR.

WASH BRICK AND MORTAR JOINTS ALREADY REPOINTED WITH PROSCO 600 MND80 MASONRY CLEANER AND BRUSH THE AREA CLEAN.

REVIEW EXISITNG ALUMINUM FASCIA. INSTALL NON-SHRINKING GROUT FORMED AT AT 45° ANGLE BENEATH LOWER EDGE OF EXISTING FASCIA AND EXISTING EXTERIOR WALL TO PROPERLY SHED WATER AWAY FROM THE BUILDING.

REMOVE EXISTING WOOD TRIM THAT IS LIFTING AWAY FROM THE BUILDING AND REPLACE WITH NEW BORAL TRIM, CUT TO SIZE. PAINT TO MATCH EXISTING PAINT COLOR. APPROXIMATE SIZE 8" X 12". G.C. TO CONFIRM ACTUAL DIMENSIONS IN FIELD.

R&D EXISTING HORIZONTAL DOWNSPOUT EXTENSION THAT TRANSVERSE GRADE. ADD NEW BOOT DOWNSPOUT EXTENSTION TO CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWING

ADD ANGLED DOWNSPOUT EXTENSION TO EXISTING DOWNSPOUT SO THAT IT CLEAR STAIR TREAD. ADD NEW BOOT AND CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWINGS.

REPLACE EXISTING ROOF VENT STACK WITH NEW LOW FUEL DOUBLE WALL VENT PIPE. PROVIDE FLASHING AT INTERSECTION OF NEW PIPE AND EXISTING ROOFING MATERIAL.

PLUG OPENING AROUND CONDENSATE LINE WITH MORTAR TO MATCH EXISTING.

R&D MASONRY AT DOOR OPENING ALREADY INFILLED (AND SURROUNDING AREA). EXISTING JOINTS ARE CRACKED, MASONRY COLOR DOES NOT MATCH AND JOINTS DO NOT ALIGN. F&I NEW BRICK & MORTAR TO MATCH ADJACENT BRICK WORK. ALIGN NEW MASONRY WITH ADJACENT MASONY ON SECOND FLOOR SOUTH ELEVATION.

F&I NEW GUTTER, DOWNSPOUT AND SPLASH BLOCK. COORDINATE WITH CIVIL DRAWINGS AND DRYWELL LOCATIONS.

A2.28 AT EXISTING FOOTING / COLUMN CONNECTION AT REAR CANOPY: CUT DOWN EXISTING ANCHOR BOLT SCREW ENDS SO THAT THEY ARE NO GREATER THAN  $\frac{1}{2}$ " HIGH ABOVE THE EXISTING BOLTS. TYPICAL EACH COLUMN).

> REVIEW EXISTING ROOF SCUPPER FOR LEAKS. F&I NEW ROOF SCUPPER TO MATCH EXISTING. SEALL ALL AREAS TO PREVENT FUTURE & PRESENT LEAKS.

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Project ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# **155 NIAGARA STREET** PROVIDENCE, RI 02907

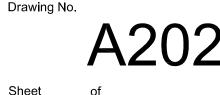
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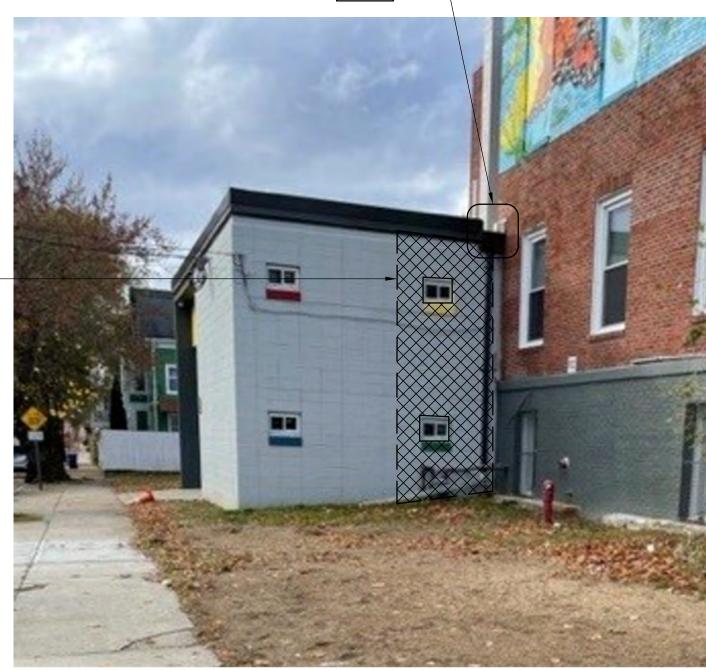
Sheet Contents

**EXTERIOR ELEVATIONS** 

Project Number



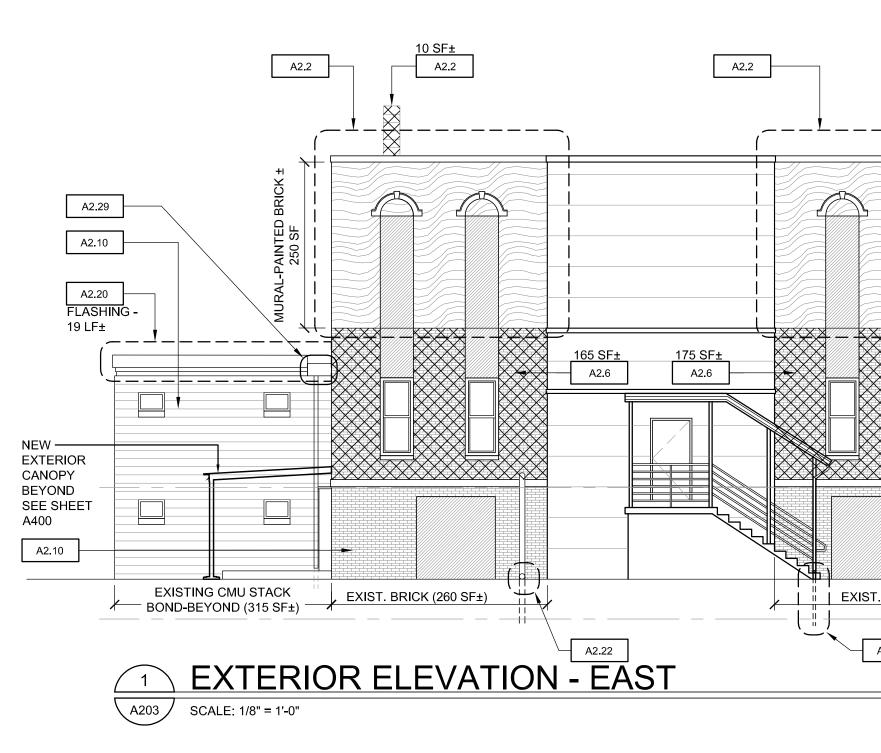
A2.29



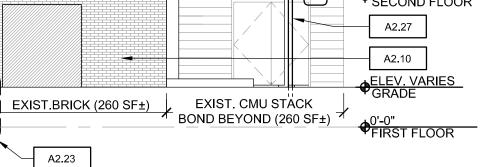
REPOINT AND SEAL ENTIRE AREA OF MANSONRY BEHIND SCUPPER AND DOWNSPOUT. R&D ANY EXISTING CONDIUT OR ELECTRICAL ITEMS NO LONGER IN USE THIS WALL. FILL HOLES / OPENINGS WITH MORTAR AND SEAL. TOUCH UP PAINT TO MATCH EXISTING. HATCHED AREA FOR ABOVE NOTED WORK IS APPROXIMATELY (150 SF±).

SOUTHEAST BUILDING ELEVATION AT ATLANTIC AVENUE

#### SOUTHEAST PARTIAL ELEVATION 2 A203 NOT TO SCALE



	<u>GENERAL NOTES</u> :	ELEVAT
	1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING ANY WORK. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL QUANTITIES AND DIMENSIONS OF NEW AND DEMOLITION WORK AREA.	A2.1 A2.2
	<ol> <li>CONTRACTOR SHALL PATCH / PAINT / REPAIR ANY WALL / SURFACE LOCATIONS TO MATCH ADJACENT FINISH / EXISTING PAINT COLOR IN LOCATIONS WHERE DEMOLITION IS REQUIRED.</li> </ol>	
	3. CONTRACTOR TO PROVIDE ALL OSHA AND/OR BUILDING CODE REQUIRED SAFETY PROTECTION REQUIRED TO PROTECT WORKERS FROM FALLS, CRUSHING, ELECTROCUTION ETC.	A2.3
	<ol> <li>CONTRACTOR TO MAINTAIN BUILDING AND WORK AREAS IN A SAFE AND SECURE MANNER. MAINTAIN PHYSICAL BARRIER TO PREVENT BUILDING / SITE ACCESS BY CHILDREN AT A MINIMUM.</li> </ol>	A2.4
	5. CONTRACTOR TO PROTECT ALL EXISTING WORK TO REMAIN AND WILL REPAIR ANY DAMAGED AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.	A2.5
	6. EXISTING BUILDING CONSTRUCTION DEFICIENCIES NOT INDICATED ON THE DRAWINGS, BUT UNCOVERED AND/OR	A2.6
	DISCOVERED BY CONTRACTORS CONSTRUCTION ACTIVITIES SHALL BE REPORTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF NEW WORK. ADDITIONAL DETAILS SHALL BE FURNISHED AS NECESSARY.	A2.7
	<ol> <li>CONTRACTOR TO DE-ENERGIZE, CAP / SHUT OFF ALL UTILITIES AS NECESSARY PRIOR TO ANY DEMOLITION WORK.</li> </ol>	A2.8
	8. CONTRACTOR SHALL CONTACT DIG SAFE PRIOR TO ANY REQUIRED EXCAVATION WORK.	A2.9
	9. CONTRACTOR TO MAINTAIN DUMPTER AT A LOCATION THAT IS APPROVED BY THE OWNER.	A2.10
	ADD ALTERNATE 1: INCLUDE ADD ALTERNATE COST FOR LABOR AND MATERIALS TO PRESSURE WASH ALL NON PAINTED BRICK AND THEN F&I A SEALER FOR ALL BRICK WORK THAT IS NOT PAINTED (TYPICAL ENTIRE BUILDING).	A2.11
	NOTE: SEE SPECIFICATIONS FOR ALTERNATES & ALLOWANCES	A2.12 A2.13
		A2.14
	DEMOLITION LEGEND:	A2.15
	EXISTING WALL / ITEM TO REMAIN	A2.16
	EXISTING WALL / ITEM TO BE REMOVED	A2.17
	XXX NOTES WITHOUT AN ARROW INDICATE AN ENTIRE SPACE/AREA.	A2.17
	- XXX NOTES WITH AN ARROW(S) INDICATE SPECIFIC AREAS AND/OR ITEMS.	A2.19
	R&D = REMOVE & DISPOSE OF R&S = REMOVE & SALVAGE	A2.20
	APPROXIMATE AREA OF EXISTING MURAL, PAINT RESTORATION ALLOWANCE THESE LOCATIONS	A2.21
	EXISTING BRICK, SEE NEW WORK NOTES	A2.22
	HATCH OVERLAY DENOTES APPROXIMATE AREA OF MASONRY IS TO BE REPOINTED	A2.23
	EXISTING STACK BOND CMU SEE WORK NOTES	A2.24
	EXISTING PAINTED PRECAST CMU, SIZE VARIES	A2.25 A2.26
	EXISTING PLYWOOD / INFILL PANEL TO REMAIN	A2.20
	PLYWOOD / INFILL PANEL TO BE REMOVED	A2.27
)	BRICK TO BE WASHED WITH MASONRY CLEANER& BRUSHED CLEAN	A2.28
	AREA OF MASONRY IS TO BE REPOINTED & CLEANED	A2.29
FLASHING-		
	RICINC	
A2.6 ASSUME 20% OF A2.10 TO BE REPOINT	FARE	
★10'-11.5"± SECOND FLOOR		



**TONS AND EXTERIOR WORK NOTES** 

ARCHED CONCRETE HEADER / KEYSTONE: FILL JOINTS BETWEEN HEADER AND ADJACENT BRICK WITH MORTAR. MATCH EXISTING MORTAR COLOR, TYPICAL.

MISSING MORTAR JOINTS AT MURAL / PAINTED BRICK: ± 20% OF AREA AT EACH ELEVATION (AREAS THAT ARE DARKER THAN ADJACENT PAINT COLOR INDICATE MISSING MORTAR JOINT) -GRIND OUT EXISTING PAINT AND MORTAR JOINT AND INFILL WITH NEW MORTAR. PAINT AFFECTED BRICK AND MORTAR AREA TO MATCH EXISTING PAINT COLOR. PAINT RESTORATION ALLOWANCE AT LOCATIONS WHERE MURAL / ARTWORK NEEDS REPAINTING.

SOLDER COURSE BRICK HEADERS: REPOINT ALL BRICK HEADERS. CUT OUT JOINTS AND INFILL JOINTS WITH NEW MORTAR. MATCH EXISTING MORTAR COLOR. 48" APPROXIMATE WINDOW OPENING.

STEEL WINDOW LINTELS: R&D EXISTING STEEL WINDOW LINTEL THAT IS CORRODED & REPLACE WITH A NEW GALVINIZED STEEL LINTEL TO MATCH EXISTING SIZE, GUAGE AND CONFIGURATION. NEW LINTEL TO BE INSTALLED IN THE LOCATION OF EXISTING LINTEL WITH EXACT BEARING POINTS. REMOVE BRICK SOLDER COURSE HEADER AND BRICK ABOVE AS NEEDED TO REPLACE THE LINTEL. RESET BRICKS AND ADD NEW MORTAR TO MATCH EXISTING MORTAR COLOR. SEE DETAILS 5/A500 AND 6/A500.

FILL CRACK IN MASONRY UNITS AND MORTAR. FILL MORTAR JOINTS WITH AN OPENING OF  $\frac{1}{8}$ " OR GREATER. MORTAR COLOR TO MATCH EXISTING.

REPOINT EXISTING BRICK. CUT OUT ANY DAMAGED MORTAR. NEW MORTAR COLOR TO MATCH EXISTING. FILL CRACLS WITH MORTAR TO MATCH EXISTING MORTAR COLOR.

CLEAN BRICK WINDOW SILLS. CUT OUT MORTAR JOINTS AND REPOINT WITH MORTAR TO MATCH EXISTING.

BRICK TO PRECAST CMU JOINT: CUT OUT EXISTING VERTICAL JOINT FROM CONCRETE BAND UP TO ROOF FASCIA, REPLACE WITH NEW SOFT JOINT (FILLED WITH SEALANT) EACH SIDE. APPROXIMATELY ± 70 LINEAR FEET TOTAL.

R&D EXISTING LIGHT FIXTURES / ELECTRICAL BOXES / CONDUITS & WIRING NO LONGER IN USE. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR.

R&D EXISTING NAILS / CLIPS PROTRUDING OUT OF A MASONRY UNIT OR MASONRY MORTAR JOINT. PLUG ANY REMAINING HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR. TYPICAL ALL ELEVATIONS.

R&D EXISTING PLYWOOD CONCEALING WINDOW. R&D NAILS USED TO SECURE PLYWOOD TO MASONRYAND PLUG HOLES WITH MORTAR. MORTAR COLOR TO MATCH EXISING.

REPOINT EXISTING MASONRY CHIMNEY. REPLACE ANY DAMAGED / DETERIORATING FLASHING.

R&D EXISTING ABANDONED EXHAUST VENT AND INFILL HOLES WITH MORTAR. MATCH EXISTING MORTAR COLOR.

CMU STACK BOND BLOCK: GRIND OUT EXISTING PAINT. CUT OUT VERTICAL MORTAR JOINTS AND REPOINT WITH NEW MORTAR. TYPICAL AT ENTIRE ELEVATION. PRIME & PAINT CMU BLOCK. ARCHITECT TO SELECT PAINT COLOR.

FILL 12" HIGH CRACK AT THE FOUNDATION WITH EPOXY.

CMU TO CMU JOINT: CUT OUT ENTIRE MORTAR JOINT AND REPLACE WITH NEW MORTAR JOINT. UP TO UNDERSIDE OF FASCIA / FLASHING. ± 18 LINEAR FEET.

INSTALL DYMONIC PRIMER URETHANE SEALANT AT ENTIRE RIGHT SIDE TO SEAL OPENING.

R&D INSULATION & DEBRIS AT EXTERIOR VENT. REVEW TO ENSURE VENT/ DUCT IS OPERATIONAL AND FUNCTIONING PROPERLY. INSTALL NEW RODENT PROOF EXTERIOR GRILL / VENT COVER AT EXTERIOR.

WASH BRICK AND MORTAR JOINTS ALREADY REPOINTED WITH PROSCO 600 MND80 MASONRY CLEANER AND BRUSH THE AREA CLEAN.

REVIEW EXISITNG ALUMINUM FASCIA. INSTALL NON-SHRINKING GROUT FORMED AT AT 45° ANGLE BENEATH LOWER EDGE OF EXISTING FASCIA AND EXISTING EXTERIOR WALL TO PROPERLY SHED WATER AWAY FROM THE BUILDING.

REMOVE EXISTING WOOD TRIM THAT IS LIFTING AWAY FROM THE BUILDING AND REPLACE WITH NEW BORAL TRIM, CUT TO SIZE. PAINT TO MATCH EXISTING PAINT COLOR. APPROXIMATE SIZE 8" X 12". G.C. TO CONFIRM ACTUAL DIMENSIONS IN FIELD.

R&D EXISTING HORIZONTAL DOWNSPOUT EXTENSION THAT TRANSVERSE GRADE. ADD NEW BOOT DOWNSPOUT EXTENSION TO CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWING

ADD ANGLED DOWNSPOUT EXTENSION TO EXISTING DOWNSPOUT SO THAT IT CLEAR STAIR TREAD. ADD NEW BOOT AND CONNECT DOWNSPOUT TO NEW UNDERGROUND DRAINAGE. SEE CIVIL DRAWINGS.

REPLACE EXISTING ROOF VENT STACK WITH NEW LOW FUEL DOUBLE WALL VENT PIPE. PROVIDE FLASHING AT INTERSECTION OF NEW PIPE AND EXISTING ROOFING MATERIAL.

PLUG OPENING AROUND CONDENSATE LINE WITH MORTAR TO MATCH EXISTING.

R&D MASONRY AT DOOR OPENING ALREADY INFILLED (AND SURROUNDING AREA). EXISTING JOINTS ARE CRACKED, MASONRY COLOR DOES NOT MATCH AND JOINTS DO NOT ALIGN. F&I NEW BRICK & MORTAR TO MATCH ADJACENT BRICK WORK. ALIGN NEW MASONRY WITH ADJACENT MASONY ON SECOND FLOOR SOUTH ELEVATION.

F&I NEW GUTTER, DOWNSPOUT AND SPLASH BLOCK. COORDINATE WITH CIVIL DRAWINGS AND DRYWELL LOCATIONS.

AT EXISTING FOOTING / COLUMN CONNECTION AT REAR CANOPY: CUT DOWN EXISTING ANCHOR BOLT SCREW ENDS SO THAT THEY ARE NO GREATER THAN <sup>1</sup>/<sub>2</sub>" HIGH ABOVE THE EXISTING BOLTS. TYPICAL EACH COLUMN).

REVIEW EXISTING ROOF SCUPPER FOR LEAKS. F&I NEW ROOF SCUPPER TO MATCH EXISTING. SEALL ALL AREAS TO PREVENT FUTURE & PRESENT LEAKS.

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Architecture · Project Management · Interior Design

Project ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## **155 NIAGARA STREET** PROVIDENCE, RI 02907

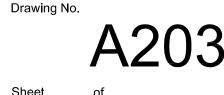
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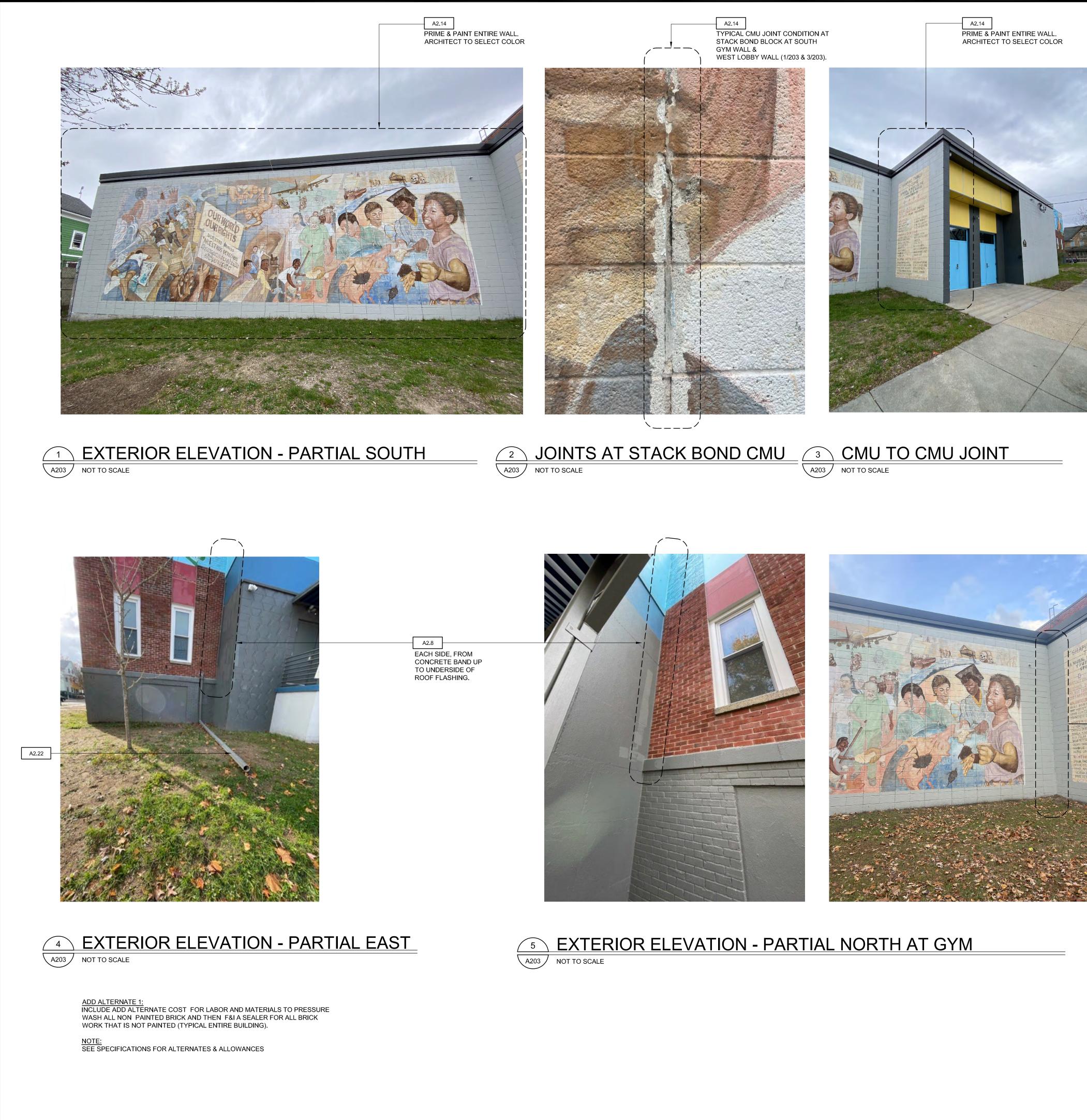
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Sheet Contents

EXTERIOR ELEVATION

Project Number.











### **GENERAL NOTES:**

1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING ANY WORK. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL QUANTITIES AND DIMENSIONS OF NEW AND DEMOLITION WORK AREA.

2. CONTRACTOR SHALL PATCH / PAINT / REPAIR ANY WALL / SURFACE LOCATIONS TO MATCH ADJACENT FINISH / EXISTING PAINT COLOR IN LOCATIONS WHERE DEMOLITION IS REQUIRED.

3. CONTRACTOR TO PROVIDE ALL OSHA AND/OR BUILDING CODE REQUIRED SAFETY PROTECTION REQUIRED TO PROTECT WORKERS FROM FALLS, CRUSHING, ELECTROCUTION ETC.

4. CONTRACTOR TO MAINTAIN BUILDING AND WORK AREAS IN A SAFE AND SECURE MANNER. MAINTAIN PHYSICAL BARRIER TO PREVENT BUILDING / SITE ACCESS BY CHILDREN AT A MINIMUM.

5. CONTRACTOR TO PROTECT ALL EXISTING WORK TO REMAIN AND WILL REPAIR ANY DAMAGED AREAS AS A RESULT OF CONTRACTOR WORK AT NO ADDITIONAL COST TO THE OWNER.

6. EXISTING BUILDING CONSTRUCTION DEFICIENCIES NOT INDICATED ON THE DRAWINGS, BUT UNCOVERED AND/OR DISCOVERED BY CONTRACTORS CONSTRUCTION ACTIVITIES SHALL BE REPORTED TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF NEW WORK. ADDITIONAL DETAILS SHALL BE FURNISHED AS NECESSARY.

CONTRACTOR TO DE-ENERGIZE, CAP / SHUT OFF ALL UTILITIES AS NECESSARY PRIOR TO ANY DEMOLITION WORK.

8. CONTRACTOR SHALL CONTACT DIG SAFE PRIOR TO ANY REQUIRED EXCAVATION WORK.

9. CONTRACTOR TO MAINTAIN DUMPTER AT A LOCATION THAT IS

APPROVED BY THE OWNER.

ELEVATIONS AND EXTERIOR WORK NOTES

A2.1

A2.2

A2.3

A2.4

A2.5

A2.6

A2.7

A2.8

A2.10

A2.11

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A2.23

A2.24

A2.25

A2.26

A2.27

A2.28

A2.29

A2.16

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Project ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## **155 NIAGARA STREET** PROVIDENCE, RI 02907

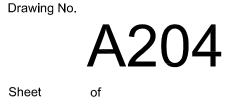
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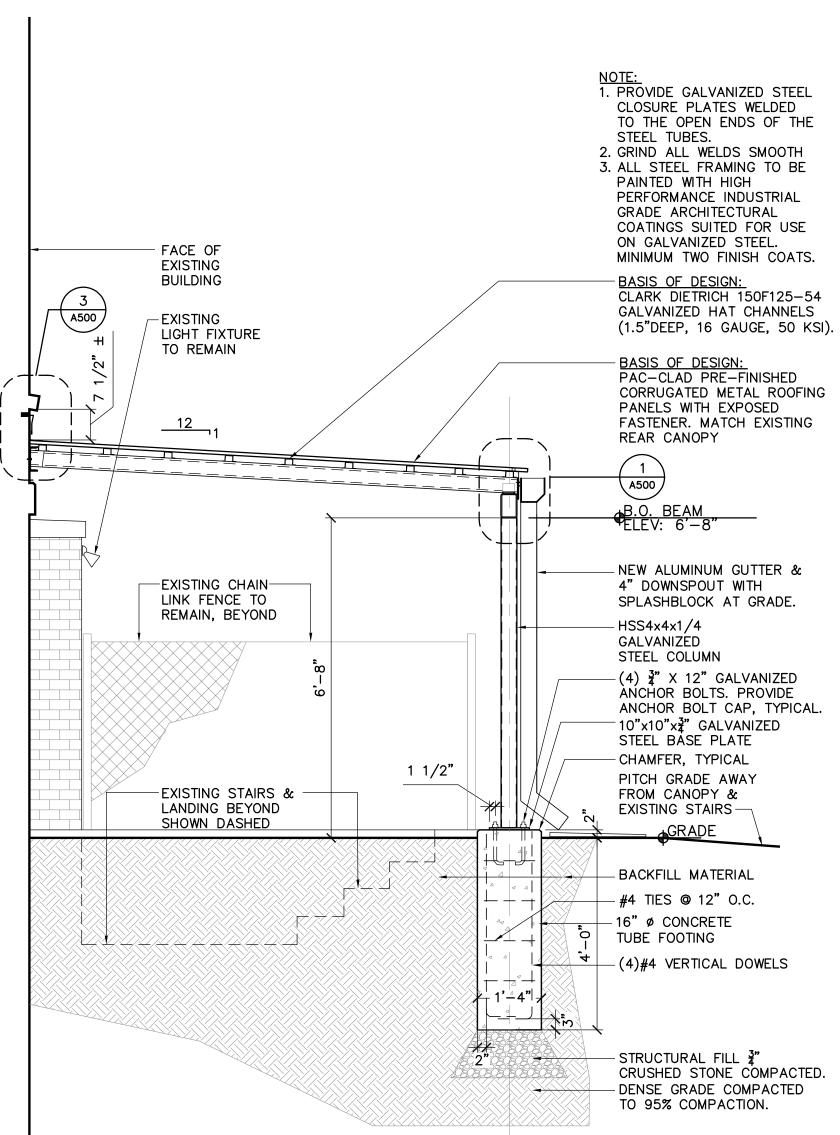
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Sheet Contents

EXTERIOR **ELEVATIONS** 

Project Number 684

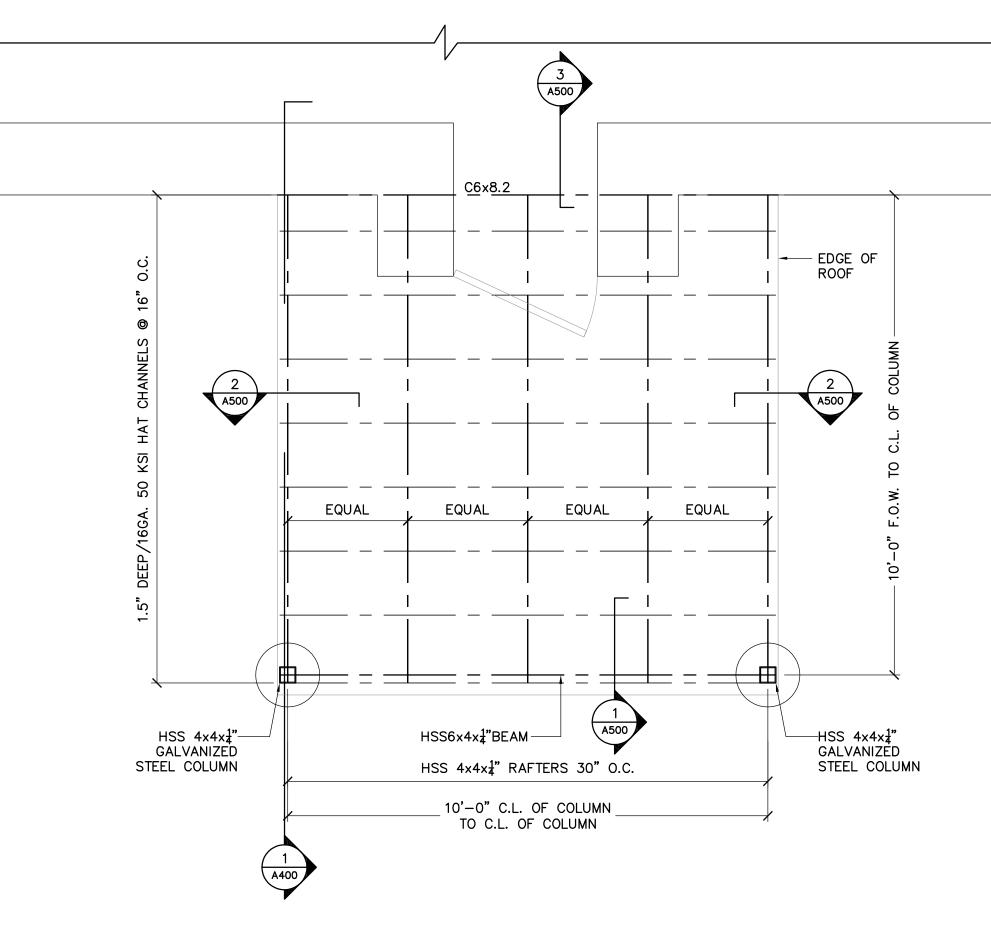


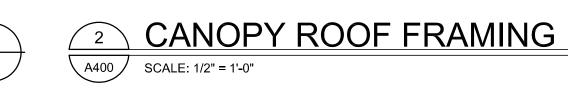




SECTION THRU CANOPY A400 SCALE: 1/2" = 1'-0"

- STRUCTURAL FILL  $\frac{3}{4}$ " CRUSHED STONE COMPACTED.





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Project

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BUILDING RENOVATIONS

## 155 NIAGARA STREET PROVIDENCE, RI 02907

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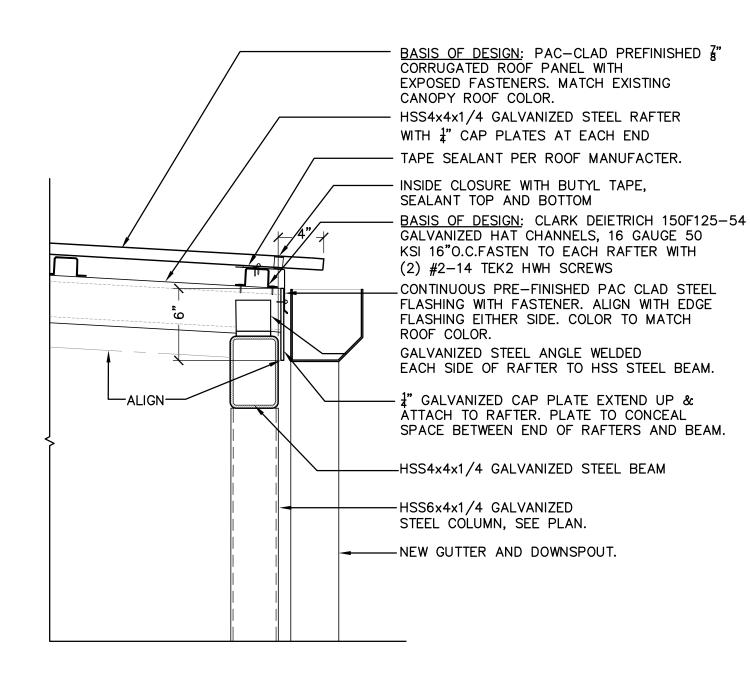
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Sheet Contents CANOPY SECTION & FRAMING

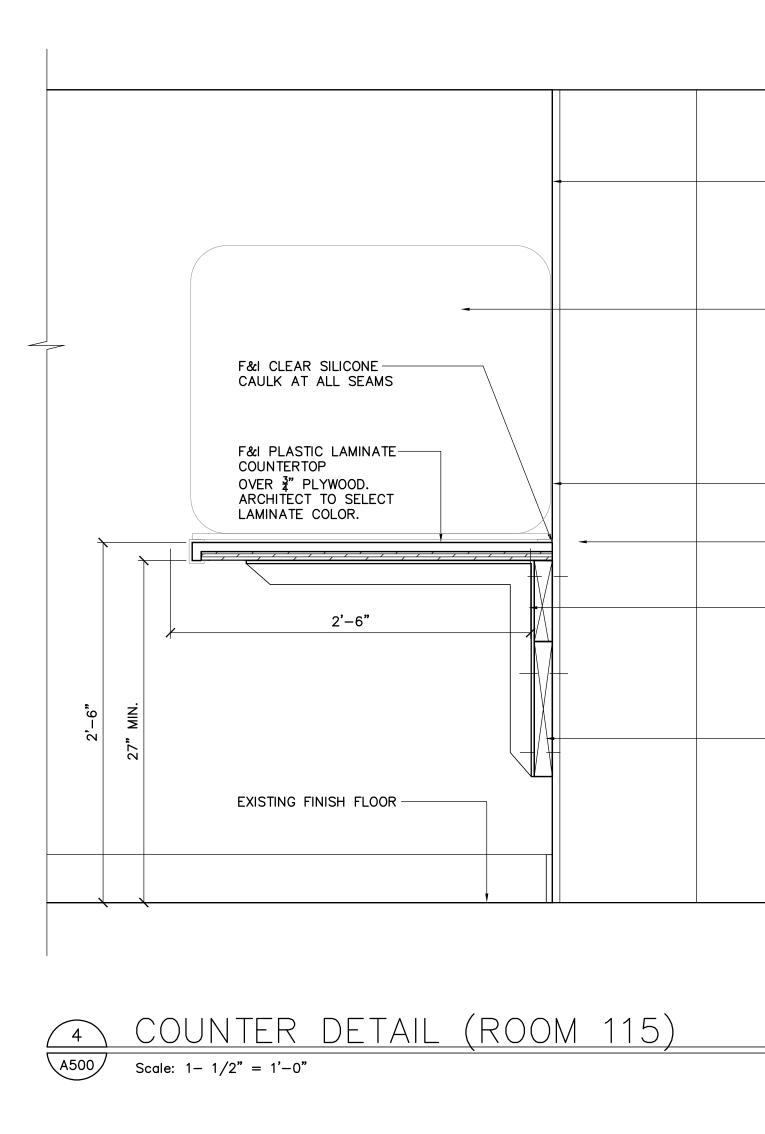
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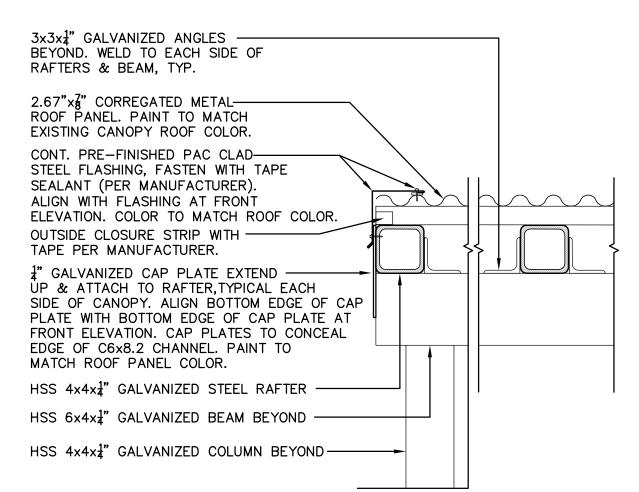
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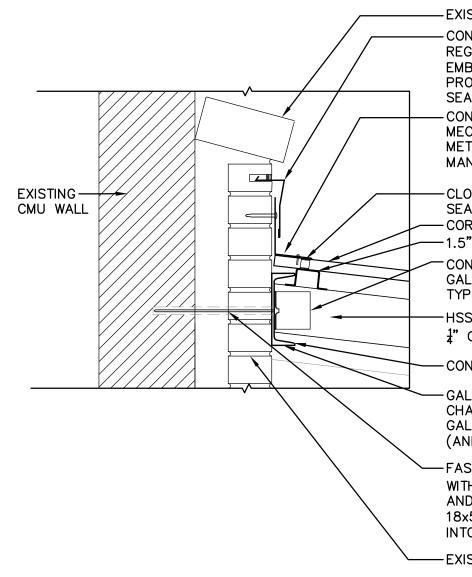














# Scale: 1 - 1/2" = 1' - 0"



- PAINT EXISTING WALLS.

### BASIS OF DESIGN: F&I (15 TOTAL) LOFTWALL PARRALLEL

SIDE TO SIDE PANEL 30"WIDE X 24" HIGH ACOUSICAL, TACKABLE, MAGNETIC DESK DIVIDER PANEL WITH COUNTER MOUNT DEVICE ORGANIZER / PANEL MOUNT). ARCHITECT TO SELECT COLOR. (www.loftwall.com/desk-divider/)

#### SEE ELECTRICAL FOR NEW POWER & DATA RECEPTECLES

F&I IN WALL BLOCKING PATCH AND PAINT EXISTING WALLS

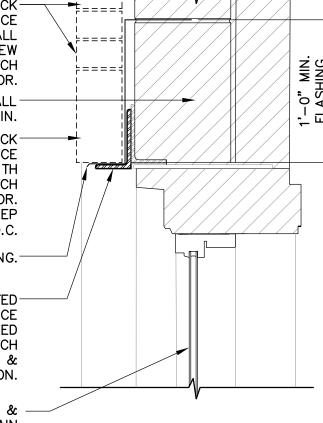
- <u>BASIS OF DESIGN:</u> F&I IN RAKKS EH-1824 BRACKET, EQUAL SPACING. ARCHITECT TO SELECT COLOR. FASTENERS AND BRACKET SPACING AS RECOMMENDED BY MANUFACTURER.

F&I INWALL BLOCKING. AT CMU WALLS F&I SURFACE MOUNTED BLOCKING WITH SMOOTH FINISH. PAINT TO EXPOSED BLOCKING TO MATCH EXISTING WALL.

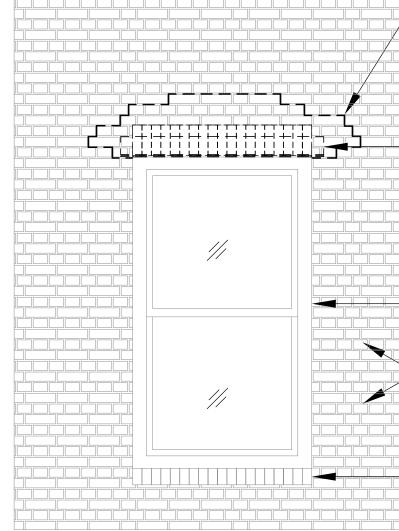


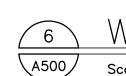
LINTEL AND REPLACE WITH NEW GALVANIZED STEEL LINTEL. MATCH EXISTING GUAGE & DIMENSION.

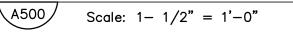
> EXISTING WINDOW & TRIM TO REMAIN



EXISTING V.I.F







INTEL DETAIL





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## **155 NIAGARA STREET** PROVIDENCE, RI 02907

## Drawing Status **ISSUED FOR** CONSTRUCTION

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Sheet Contents DETAILS

Project Number. 6844



-EXISTING WINDOW SILL - CONTINUOUS PREFINISHED REGLET FLASHING (COUNTER FLASHING) EMBEDDED IN EXISTING MORTAR JOINT. PROVIDE LEAD WEDGES & CONTINUOUS SEALANT. -CONTINUOUS PRE-FINISHED HEADWALL FLASHING MECHANICALLY FASTENED TO BUILDING WALL & METAL ROOFING PANELS IN ACCORDANCE WITH ROOF PANEL MANUFACTER'S RECOMMENDATIONS. MATCH ROOF COLOR. -CLOSURE WITH BUTYL TAPE. SEALANT TOP AND BOTTOM - CORREGATED ROOF PANEL -1.5" DEEP HAT CHANNELS CONNECT RAFTER TO CHANNEL WITH 3"X3"x1" GALVANIZED ANGLE. WELD TO EACH SIDE, TYP. EACH RAFTER. -HSS4x4x1/4 GALVANIZED STEEL RAFTER WITH  $\frac{1}{4}$ " CAP PLATES EACH END. -CONTINUOUS GALVANIZED C6x8.2 CHANNEL -GALVANIZED CAP PLATE BEYOND. END OF C6x8.2 CHANNEL SHOULD NOT EXTEND BEYOND GALVANIZED CAP PLATES ON EITHER SIDE (AND HEADWALL FLASHING ABOVE). -FASTENED CHANNEL TO EXISTING WALL

WITH  $\frac{1}{2}$  "Ø THREADED RODS @ 16" O.C. AND HILTI HIT-HY 270 EPOXY & HILTI HIT-SC 18x50 SCREEN TUBES, MIN. 2" EMBEDMENT INTO EXISTING CMU BACKUP WALL. -EXISTING BRICK WALL

Scale: 1 - 1/2" = 1' - 0"

## NOTE: CONTRACTOR TO SUBMIT MORTAR COLOR SAMPLES TO BE APPROVED PRIOR TO ANY WORK BEING COMPLETED.

REMOVE EXISTING BRICK AND SOLDER COURSE HEADER AS NEEDED TO REPLACE DETERIORATED HEADER. SALVAGE BRICK FOR REUSE. REINSTALL MASONRY THAT IS SOUND. BRICK AND MORTAR JOINT WORK TO MATCH EXISTING EXTENT POSSIBLE.

REMOVE DETERIORATED STEEL LINTEL. REPLACE IN KIND WITH NEW GALVANIZED STEEL LINTEL. CARRY 6"X4"X3" L FOR PRICING OF NEW STEEL ITEM

EXISTING BRICK TO REMAIN. SEE ELEVATIONS TO WORK NOTES.

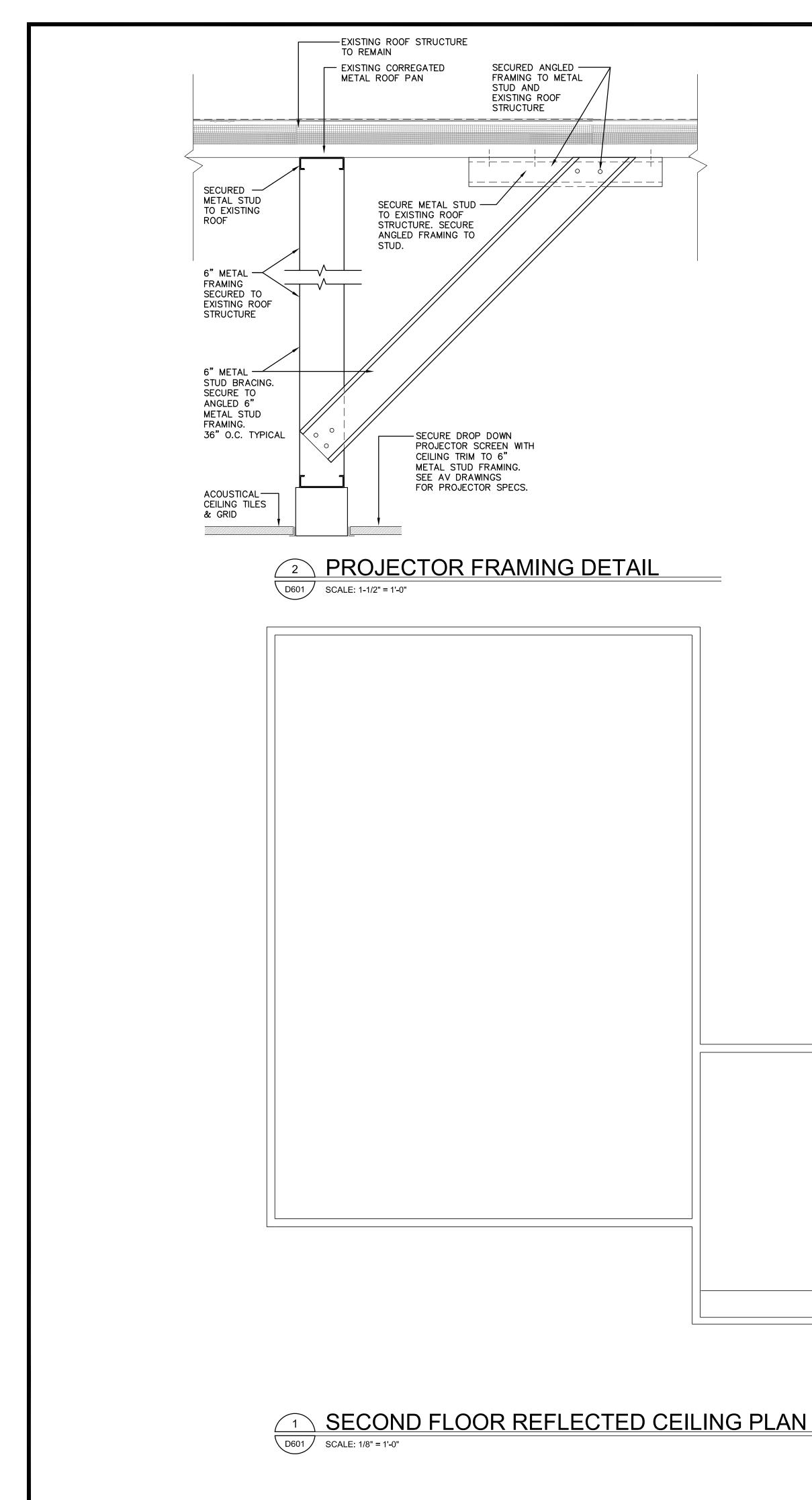
EXISTING

# WINDOW ELEVATION

Scale: 1/2" = 1'-0"

- EXISTING WINDOW TO REMAIN

BRICK SILL



IEW WORK NOTES		
1	F&I NEW VISION PANEL WITH TEMPERED GLASS IN EXISTING WALL OPENING. INSTALL PRIVACY FILM OVER NEW GLAZING. SEE SPECIFICATIONS AND SUBMIT FOR ARCHITECT REVIEW.	
2	F&I NEW PRIVACY FILM AT DOOR GLAZING. SEE SPECIFICATIONS AND SUBMIT FOR ARCHITECT	

- A3 F&I NEW GYPSUM BOARD AT END OF WALL TO CONCEAL STUDS, WATER/WASTE LINES. PRIME & PAINT.
- A4 F&I NEW INSULATED AND TEMPERED GLAZING AT EXISTING SIDELIGHT. INSTALL PRIVACY FILM OVER NEW GLAZING. SEE SPECIFICATIONS FOR PRIVACY FILM AND SUBMIT FOR ARCHITECT REVIEW.
- A5 F&I NEW DOOR HARDWARE AT EXISTING DOOR. SEE DOOR SCHEDULE AND SPECIFICATIONS FOR NEW DOOR HARDWARE.
- A6 F&I NEW CARD READER, BRING POWER TO EXISTING / NEW DOOR / FRAME AS REQUIRED. COORDINATE WITH CARD READER VENDOR. SEE ELECTRICAL DRAWINGS AND DOOR HARDWARE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
- A7 F&I (2) SETS OF ROLLER SHADES AT EACH WINDOW (1 SET TO BE BLACKOUT SHADE AND THE OTHER WILL BE A LIGHT FILTERING SHADE). PROVIDE F.R. BLOCKING AS NEEDED TO INSTALL ROLLER SHADES. PATCH & PAINT AROUND INSTALLATION AREA.
- A8 PATCH & PAINT EXISTING WALLS AS NEEDED FOLLOWING ELECTRICAL UPGRADES.

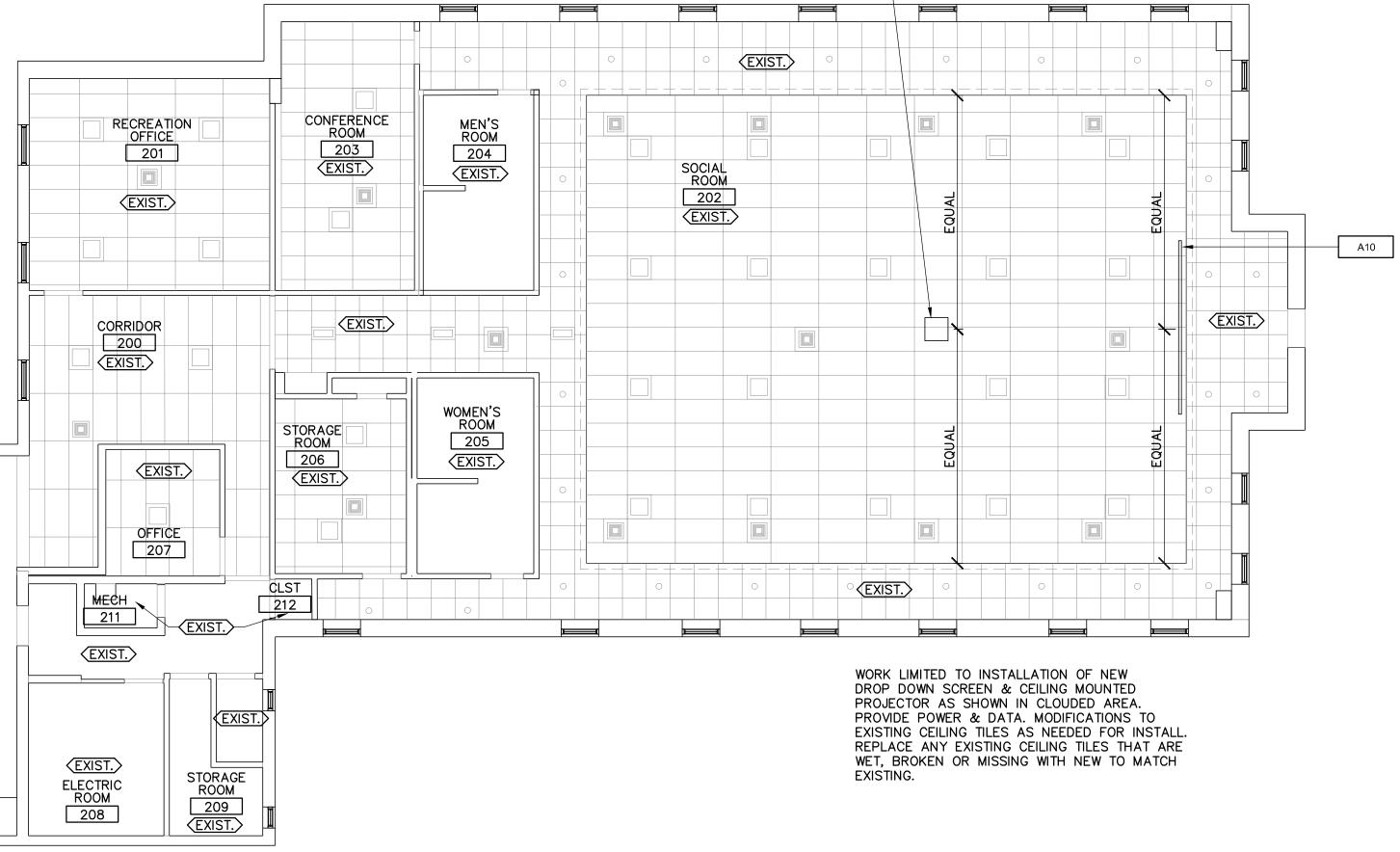
REVIEW.

- A9 F&I NEW FLOOR FINISH & BASE. PREP FLOOR AS RECOMMENDED BY MANUFACTURER. SEE SPECIFICATIONS.
- A10 NEW DROP DOWN SCREEN. MODIFY EXISTING ACOUSTICAL CEILING TILES & GRID AS NEEDED TO INSTALL NEW DROP DOWN SCREEN. F&I NEW A.C.T TILES & GRID AS NEEDED AT AREA OF WORK. PROVIDE POWER. SEE ELECTRICAL DRAWINGS AND I.T. NEW WORK PLANS. F&I STUD FRAMING WITH ANGLED STUD SECURE TO EXISTING ROOF STRUCTURE TO MOUNT NEW PROJECTOR TO EXISITNG ROOF STRUCTURE. PROVIDE ANY BLOCKING AND/OR UNITSTRUT AS NEEDED. SEE 2/A601.
- A11 REPLACE EXISTING WINDOW SEALANT AT ENTIRE INTERIOR PERIMETER OF WINDOWS. SEALANT SHOULD BE INSPECTED TO DETERMINE IF IT CONTAINS ASBESTOS AND SHOULD BE ABATED.
- A12 REPLACE VENT STACK PIPE WITH NEW LOW FUEL DOUBLE WALL VENT PIPE AND FLASH INTO EXISTING ROOFING MATERIAL.
- A13 AT AREA OF EXCAVATION, BACKFILL AND GRADE EFFECTED / DISTURBED AREAS WITH COMPACTED FILL AND GRASS SEED. GRADE AREAS TO PITCH AWAY FROM THE BUILDING AND EXTERIOR STAIRS.
- A14 NEW CEILING MOUNTED PROJECTOR. PROVIDE POWER. SEE ELECTRICAL AND I.T. WORK PLANS. PROVIDE BLOCKING AND/OR UNISTRUT TO SECURE NEW PROJECTOR TO EXISTING STRUCTURE.
- A15 F&I NEW 6" Ø HDPE WASTE PIPE FROM EDGE OF BUILDING, PROVIDE A WYE TO CONNECT TO EXISTING WASTE LINE. CONFIRM LOCATION IN FIELD. EXCAVATION AS REQUIRED TO INSTALL NEW WASTE PIPE. ALL WORK MUST MEET CODE. SEE CIVIL DRAWINGS.
- A16 F&I NEW GUTTER & DOWNSPOUT AND SPLASH BLOCK. PROVIDE ANGLED DOWNSPOUT CONNECTION TO DIRECT WATER AWAY FROM THE BUILDING. SEE CIVIL DRAWINGS NEW WORK NOTES.

A17 REVIEW EXISTING FLOOR DRAIN AND CLEAN OUT DRAIN COVER AND DRAIN PIPE CONNECTION.

- A18 SEE CIVIL DRAWINGS FOR NEW DRYWELL & GALVANIZED METAL GRATE . FINAL GRATE ELEVATION TO BE 1" LOWER THAN THE EXISTING DOOR THRESHOLD.
- A19 SET NEW THRESHOLD IN A CONTINUOUS BEAD OF MASTIC SEALANT.
- A20 F&I NEW DOWNSPOUT EXTENSION TO EXISTING DOWNSPOUT AND CONNECT TO NEW DRYWELL. SEE CIVIL DRAWINGS. REVIEW EXISTING SCUPPER CONNECTED TO DOWNSPOUT. REPLACE SCUPPER IN KIND IF CRACKED OR BROKEN.

NOT ALL WORK NOTES LISTED ABOVE USED ON THIS SHEET.



<b>GENERAL NOTES:</b>	

- PRIOR TO ANY NEW WORK.
- ARCHITECTURAL PLANS WITH ELECTRICAL, MECHANICAL, PLUMBING, I.T. AND LIFE SAFETY DRAWINGS.

LEGEND:

EXIST.

EXISTING CEI HVAC REGIST SHOWN), AND VERIFY EXIST
EXISTING CEI
EXISTING LIG
EXISTING REC
EXISTING 2' X GRID TO REM
EXISTING 2' X GRID TO REM
NEW CEILING

STRUCTURE.

A14

1. GENERAL CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS IN FIELD

2. REVIEW ANY UNFORSEEN CONDITIONS IN FIELD WITH ARCHITECT AND OWNER. 3. COORDINATE NEW WORK PLANS WITH DEMOLITION PLANS. COORDINATE

4. ALL DIMENSIONS TO EXISTING CONSTRUCTION ARE TO FACE OF <u>FINISH</u> U.N.O.

EILING FINISH, LIGHT FIXTURES, TERS, LIFE SAFETY, SPRINKLER HEADS (NOT D FIRE PROTECTION DEVICES TO REMAIN. TING CEILING HEIGHTS IN FIELD.

EILING REGISTER TO REMAIN

GHT FIXTURE TO REMAIN

CESS LIGHT FIXTURE TO REMAIN

4' ACOUSTICAL CEILING TILES & MAIN

X 2' ACOUSTICAL CEILING TILES & MAIN

G MOUNTED PROJECTOR. SEE AV DRAWINGS. PROVIDE BLOCKING OR UNISTRUT FRAMING TO SECURE TO EXISTING ROOF STRUCTURE.

NEW CEILING MOUNTED DROP DOWN PROJECTOR SCREEN. SEE AV DRAWINGS. PROVIDE BLOCKING OR UNISTRUT FRAMING TO SECURE TO EXISTING ROOF

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BUILDING RENOVATIONS

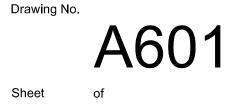
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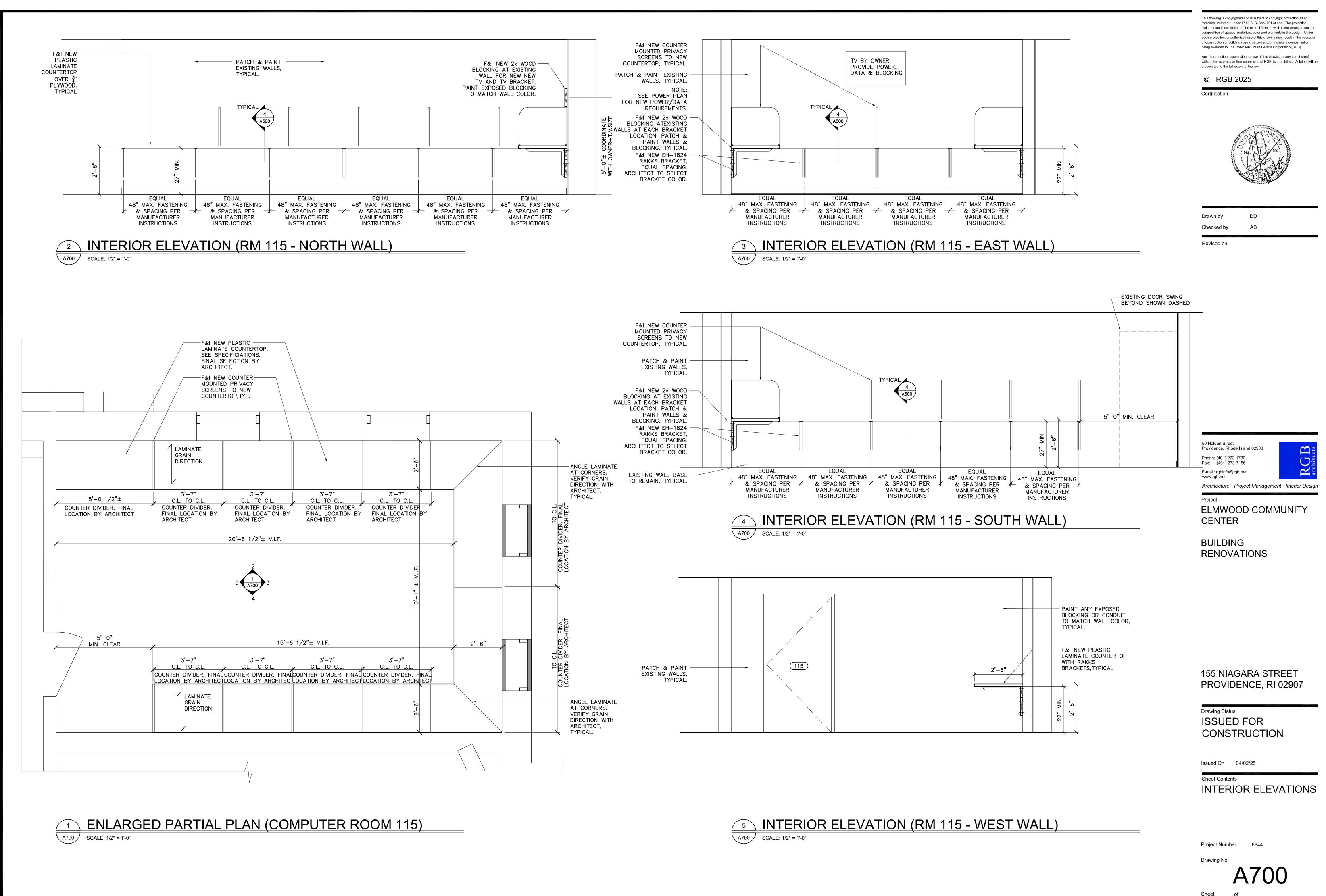
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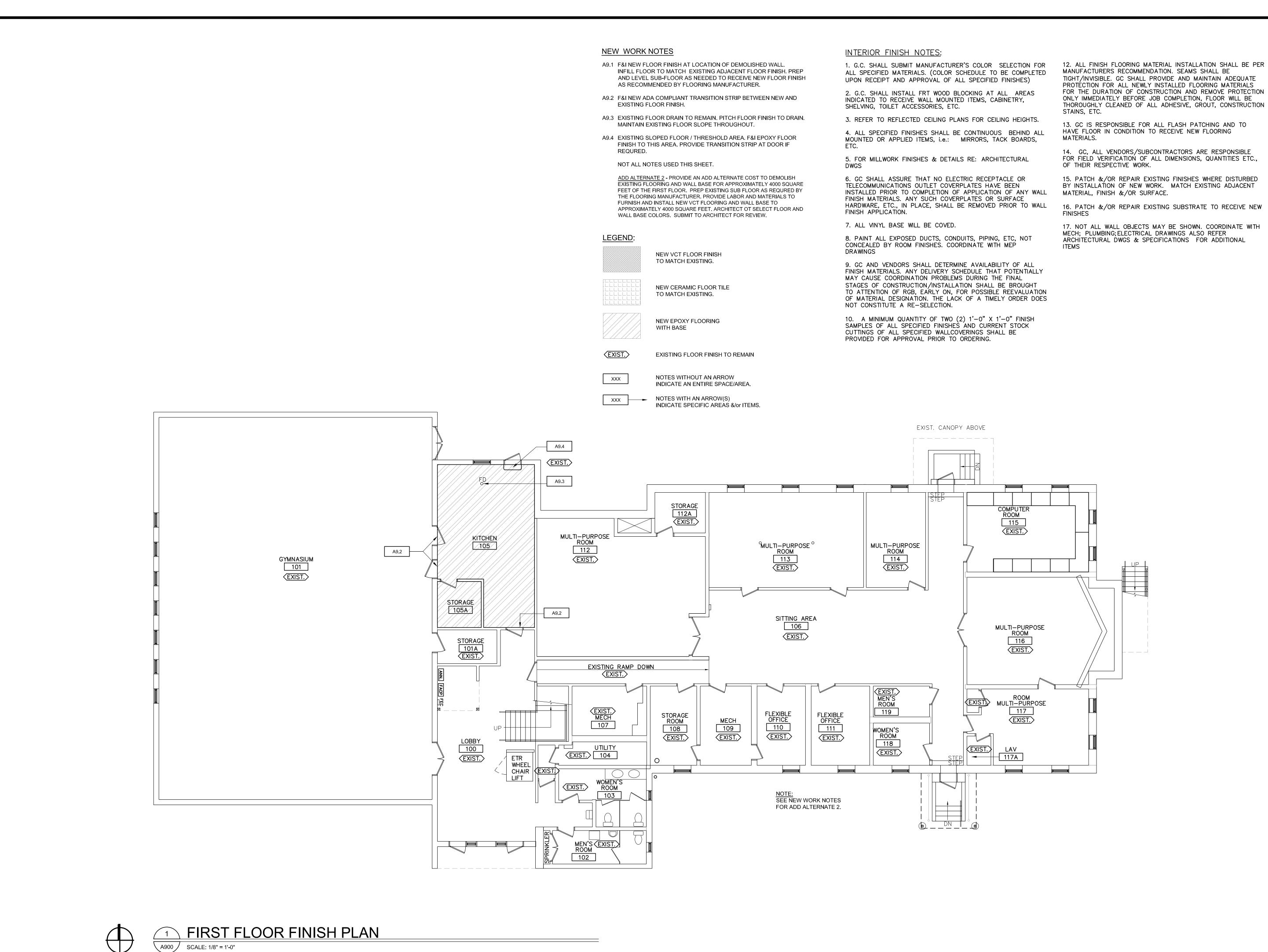
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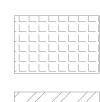
Sheet Contents SECOND FLOOR **REFLECTED CEILING** PLAN

Project Number. 6844











NOTES WITHOUT AN ARROW INDICATE AN ENTIRE SPACE/AREA.

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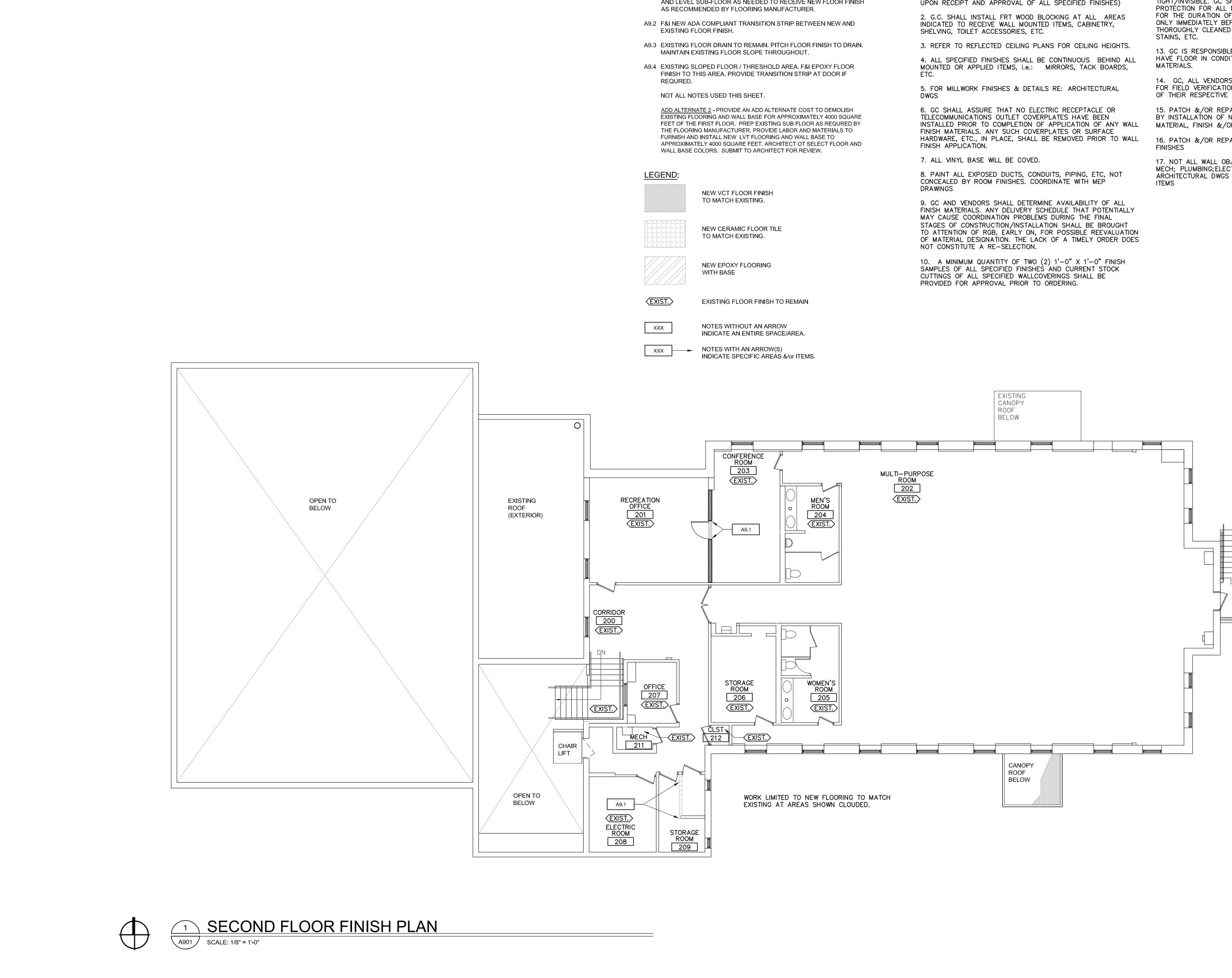
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Sheet Contents FIRST FLOOR FINISH PLAN

Project Number 6844

Sheet

Drawing No. A900



### NEW WORK NOTES

- A9.1 F&I NEW FLOOR FINISH AT LOCATION OF DEMOLISHED WALL. INFILL FLOOR TO MATCH EXISTING ADJACENT FLOOR FINISH. PREP AND LEVEL SUB-FLOOR AS NEEDED TO RECEIVE NEW FLOOR FINISH

NEW VCT FLOOR FINISH TO MATCH EXISTING.
NEW CERAMIC FLOOR TILI TO MATCH EXISTING.
NEW EPOXY FLOORING WITH BASE



### INTERIOR FINISH NOTES:

1. G.C. SHALL SUBMIT MANUFACTURER'S COLOR SELECTION FOR ALL SPECIFIED MATERIALS. (COLOR SCHEDULE TO BE COMPLETED UPON RECEIPT AND APPROVAL OF ALL SPECIFIED FINISHES)

13. GC IS RESPONSIBLE FOR ALL FLASH PATCHING AND TO HAVE FLOOR IN CONDITION TO RECEIVE NEW FLOORING

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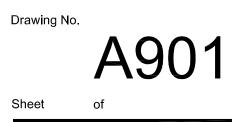
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Sheet Contents SECOND FLOOR FINISH PLAN

Project Number.



12. ALL FINISH FLOORING MATERIAL INSTALLATION SHALL BE PER MANUFACTURERS RECOMMENDATION. SEAMS SHALL BE TIGHT/INVISIBLE. GC SHALL PROVIDE AND MAINTAIN ADEQUATE PROTÉCTION FOR ALL NEWLY INSTALLED FLOORING MATERIALS FOR THE DURATION OF CONSTRUCTION AND REMOVE PROTECTION ONLY IMMEDIATELY BEFORE JOB COMPLETION, FLOOR WILL BE THOROUGHLY CLEANED OF ALL ADHESIVE, GROUT, CONSTRUCTION

14. GC, ALL VENDORS/SUBCONTRACTORS ARE RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS, QUANTITIES ETC., OF THEIR RESPECTIVE WORK.

15. PATCH &/OR REPAIR EXISTING FINISHES WHERE DISTURBED BY INSTALLATION OF NEW WORK. MATCH EXISTING ADJACENT MATERIAL, FINISH &/OR SURFACE.

16. PATCH &/OR REPAIR EXISTING SUBSTRATE TO RECEIVE NEW

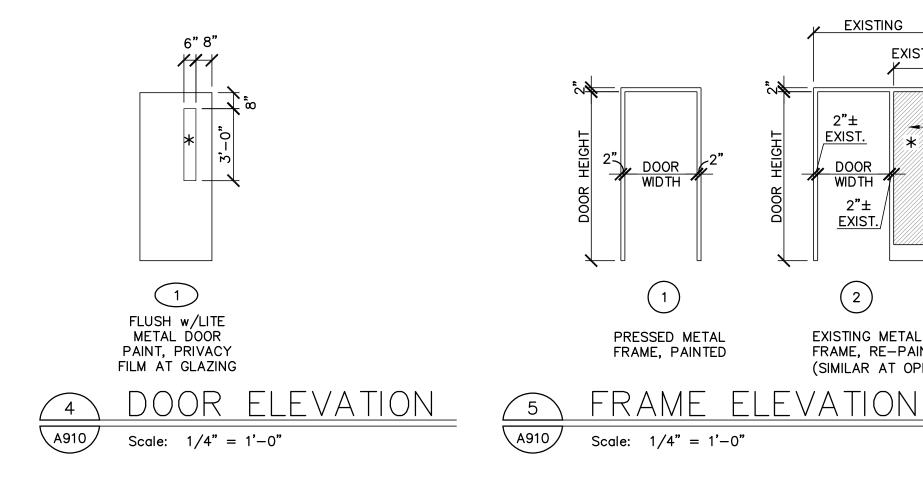
17. NOT ALL WALL OBJECTS MAY BE SHOWN. COORDINATE WITH MECH; PLUMBING; ELECTRICAL DRAWINGS ALSO REFER ARCHITECTURAL DWGS & SPECIFICATIONS FOR ADDITIONAL

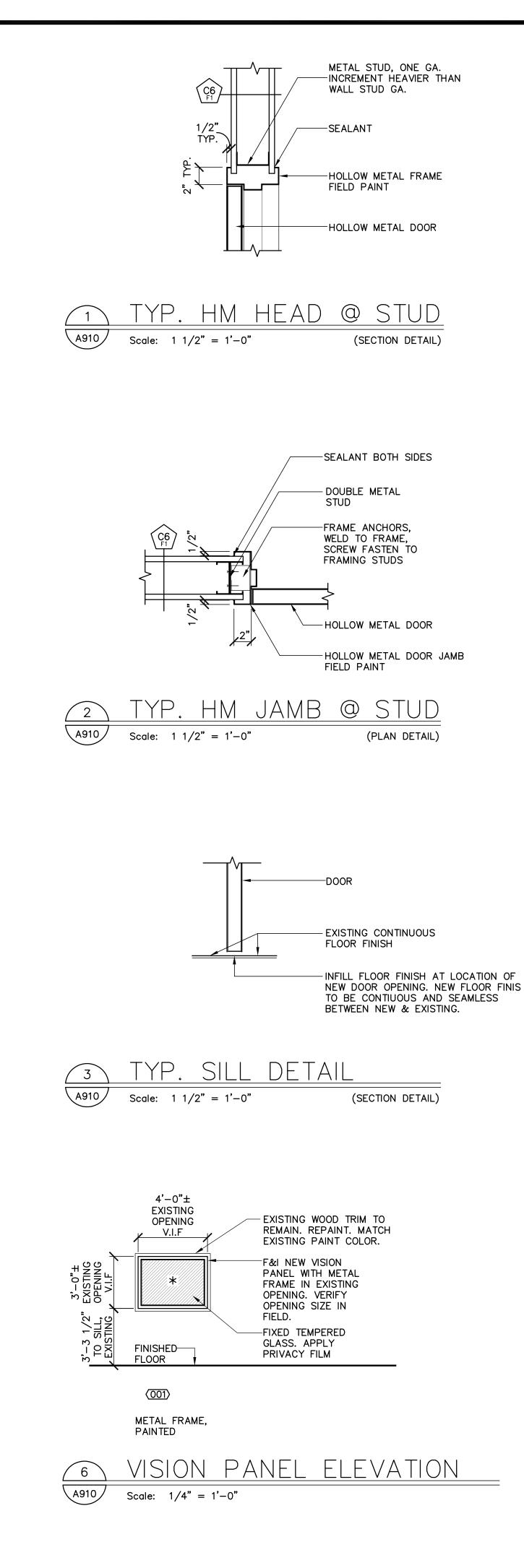
		FIRST FLOOR DO			FRAME							
		DOOR					DE1	[AIL	-	REQ <sup>*</sup> D		
MARK	SIZE	HEAD HEIGHT	TYPE	MATL	TYPE	MATL	HEAD	JAMB	Glozing	FIRE RATING	HARDWARE SET	REMARKS
100.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST				TEMPERED		SEE SPECIFICATIONS	1
	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST				TEMPERED			1
101.1	PR 3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
101.2	3'-4" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SET 2	
101.3	3'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
101.4	PR 3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
102.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
102.2	PR 2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
103	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
104.1	2'-10" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
104.2	2'-10" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
105.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
105.2	3'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
105.3	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
105.4	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
106.1	3'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
106.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
106.3	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
107	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
108.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
108.2	2'-8" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
109	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SET 3	
110.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	1
110.2	2'-8" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
111	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	1
112.1	PR 3'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
112.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
113.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
113.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
114	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	1
115	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
116.1	PR 3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
116.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
117.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
117.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
117.3	2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
118	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
119	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							

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	DOOR				FRAME							
N 4 .		DOOK					DE1	AIL		REQ'D		
MARK	SIZE	HEAD HEIGHT	TYPE	MATL	TYPE	MATL	HEAD	јамв	GLAZING	FIRE RATING	HARD₩ARE SET	REMARKS
201.1	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST				EXIST		SEE SPECIFICATIONS	1
201.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	1	METAL	1	METAL	1/A910	2/A910	TEMPERED		SEE SPECIFCIATION	1
202.1	PR 3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
202.2	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
203	2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST						SEE SPECIFICATIONS	
204	2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
205	2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
206	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
207	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
208	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
209	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
210	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
211	2'-6" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							
212	3'-0" x 7'-0" x 1 3/4"	7'-0"	EXIST		EXIST							

**REMARKS**:

1. PROVIDE PRIVACY FILM AT GLAZING.





EXISTING

2"±

<u>EXIST.</u>

DOOR WIDTH

2"±

EXIST.

2

EXISTING METAL

FRAME, RE-PAINT

(SIMILAR AT OPPOSITE HAND)

EXIST

/////

//\*/

-R&D EXISTING

WITH NEW

AT EXISTING

FRAME. VERIFY

DIMENSIONS IN

PRIVACY FILM TO NEW GLAZING AT

BUILDING INTERIOR.

FIELD. APPLY

PLYWOOD. INFILL

LAMINATED GLASS

### <u>NOTES:</u>

- 1. A60 GALVANIZED HM FRAME & DOOR (IF REPLACING EXTERIOR).
- 2. GLAZING AS NOTED &/or INDICATED BELOW. 2T PROVIDE TEMPERED GLAZING IN DOOR &/or FRAME
- 3. INSTALL FLOOR MOUNT DOOR STOP @ 8" FROM HINGE JAMB FOR 120" OPENIN
- 4. HARDWARE BY DOOR MANUFACTURER & /OR SUPPLIER U.N.O.
- 5. ALL HARDWARE TO MATCH EXISTING FINISH.
- 6. PROVIDE OSHA APPROVED HAZARD SIGN BOTH SIDES OF DOOR, WARNING OF DEPRESSED FLOOR/STEP (WHERE APPLICABLE).
- 7. PROVIDE SIGNAGE MEETING ADA REQUIREMENTS MOUNTED @ 48" MIN. & 60" MAX. A.F.F. ON WALL ADJACENT TO LATCH SIDE OF DOOR AT ALL INTERIOR DOORS.

### **GENERAL NOTES:**

### GENERAL:

- 1. FOR DOOR HEAD, JAMB, & THRESHOLD DETAILS RE: A910 UNO.
- 2. GLAZING DIMENSIONS ARE OPENING &/or MASONRY OPENINGS.
- 3. SYMBOL  $\frac{1}{2}$  [STAR] DENOTES LOCATIONS REQUIRING SPANDREL GLASS TYP.

4. SYMBOL  $\star$  DENOTES LOCATION REQUIRING TEMPERED GLAZING. TYPICAL. DOORS:

- 1. EXTERIOR DOOR FINISHES UNLESS NOTED OTHERWISE ALUMINIUM STOREFRONT: CLEAR ANODIZED HOLLOW METAL: FACTORY A60 GALV & PRIMED FOR FIELD PAINTING
- 2. INTERIOR DOOR FINISHES:
- A. HOLLOW METAL: FACTORY PRIMED FOR FIELD PAINTING U.N.O
- 3. QUICK SET KNOCK DOWN FRAMES ARE NOT ACCEPTABLE.
- PRE-ASSEMBLIED FRAMES WELDED FRAMES MEETING THE REQUIRED UL FIRE RATINGS REQUIRED ARE ACCEPTABLE FOR USE ON THIS PROJECT IF APPROVED PRIOR BY ARCHITECT IN WRITING.
- FRAME PROFILE DEPTH DIMENSION GIVEN INCLUDES THE THROAT DIMENSION PLUS 1" [1/2" RTURNS BOTH SIDES] UNO RE: 1/A920. G.C. TO CONFIRM/COORDINATE FINAL FRAME DIMENSIONS WITH FIELD CONDITIONS.
- 6. FIELD PAINT METAL FRAMES w/ COLOR AS SELECTED BY THE ARCHITECT.

### HARDWARE:

- 1. CONTRACTOR, SUPPLIERS &/or MANUFACTURERS TO PROVIDE ALL NECESSARY ACCESSORIES, SCREWS, SEX BOLTS, STRIKES, COVER PLATES, TOOLS, ETC. FOR A COMPLETED INSTALLATION OF HARDWARE FOR A FULLY FUNCTIONAL SYSTEM FOR THE INTENDED USE.
- COORDINATE WITH OWNER'S VENDOR FOR NEW CARD READERS. REPLACE ANY EXISTING HARDWARE THAT IS NOT COMPATIBLE WITH NEW CARD READER. BRING POWER TO DOOR AND FRAME WHERE CARD READER WILL BE HARDWIRED.
- 3. PROVIDE LEVER HANDLES @ ALL LATCHSETS, LOCKSETS, PANIC DEVICES, DUMMY LATCHSETS THAT ARE NEW, TYPICAL U.N.O.
- 4. TACTILE WARNING: PROVIDE MECHANICAL KNURLING WHERE REQUIRED (HIGH HAZARDS, ELECTRICAL & MECHANICAL ROOMS, ETC.) ABRASIVE COATINGS APPLIED ARE NOT ACCEPTABLE
- 5. PROVIDE DOOR SILENCERS @ ALL DOORS NOT RECEIVING WEATHERSTRIPPING. SINGLE DOORS PROVIDE 3 DOUBLE DOORS PROVIDE 2
- PROVIDE FULL WEATHERSTRIPPING @ ALL EXTERIOR DOORS, HEAD, JAMBS, SILLS TYPICAL UNO.
- AT ALL WALL MOUNTED DOOR STOPS STUD FRAME WALLS, PROVIDE 2x6 FRT WOOD BLOCKING &/or 6" x 20 gauge METAL PLATE UNDER THE GYPSUM WALL BOARD SECURED TO THE STUDS TO ATTACH THE STOP TO.

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Project

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BUILDING RENOVATIONS

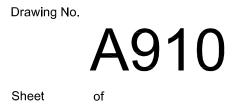
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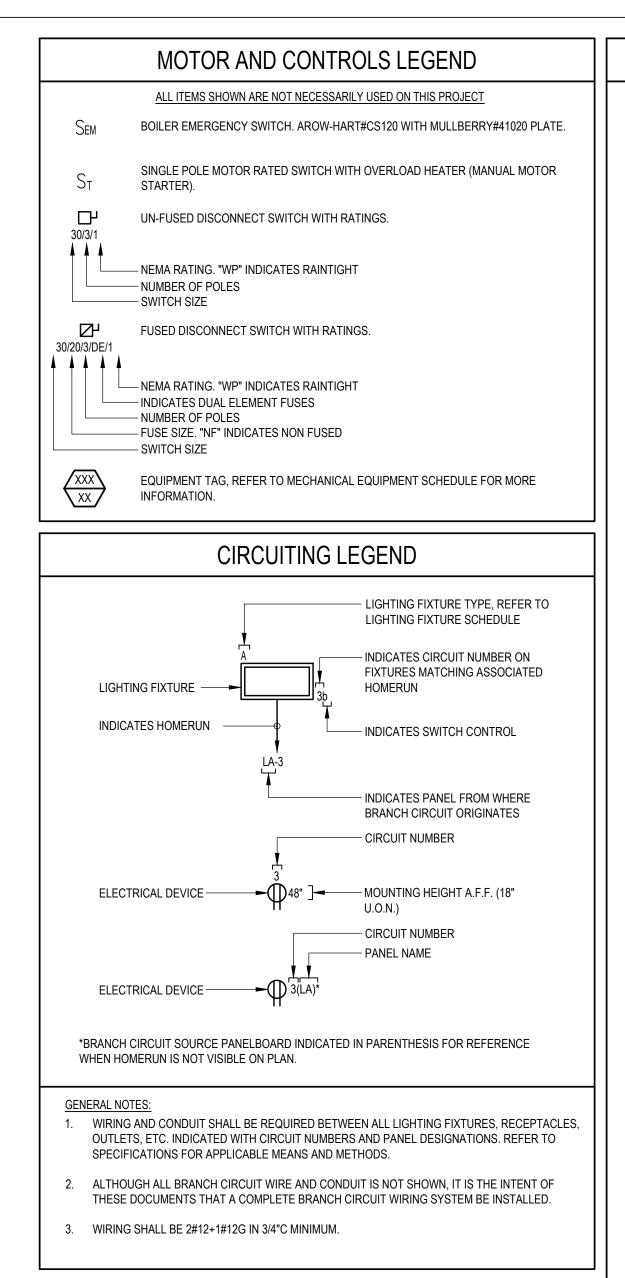
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Sheet Contents DOOR SCHEDULE & DETAILS

Project Number. 6844





GENERAL NEW WORK NOTES	ABBREVIATIONS	POWER OUTLETS & DEVICES LEGEND
1. USE #10 CONDUCTORS FOR ALL HOMERUNS OVER 100 FEET IN LENGTH.	ALL ABBREVIATIONS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT	ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT
<ol> <li>LOCATIONS SHOWN FOR CONNECTIONS TO EQUIPMENT ARE DIAGRAMMATIC. INSTALL FOR EASE OF MAINTENANCE AND TO SUIT EQUIPMENT.</li> <li>PROVIDE ALL REQUIRED PULL BOXES, JUNCTION BOXES, AND DISCONNECT SWITCHES.</li> </ol>	A/AMPAMPEREKWKILOWATTACALTERNATING CURRENTKWHKILOWATT HOURSADAAMERICAN WITH DISABILITIES ACTLANLOCAL AREA NETWORKAFAMPERE FRAMELTGLIGHTINGAFFABOVE FINISHED FLOORLVLOW VOLTAGEAFGABOVE FINISHED GRADEMAXMAXIMUMAHJAUTHORITY HAVING JURISDICTIONMCBMAIN CIRCUIT BREAKER	POWER RECEPTACLES:         ALL RECEPTACLES SHALL BE MOUNTED AT 18" A.F.F. TO CENTER, UNLESS         OTHERWISE NOTED. THE FOLLOWING DESIGNATIONS SHALL APPLY TO ALL         RECEPTACLES TYPES:         ATC       =         ATC       =         ATC       =         MOUNTED AT 6" ABOVE BACK SPLASH TO BOTTOM, REFER TO
<ol> <li>DO NOT INSTALL OUTLET BOXES BACK TO BACK.</li> <li>COLOR CODE ALL WIRING.</li> <li>PROVIDE CONDUIT SLEEVES AS REQUIRED. THROUGH FIRE RATED SEPARATIONS, FIRE SEAL AFTER WIRING IS COMPLETE.</li> <li>SUPPORT EACH LIGHTING FIXTURE INDEPENDENTLY OF THE SUSPENDED CEILING SYSTEM AND COORDINATE LOCATIONS WITH REFLECTED CEILING PLAN AND OTHER TRADES TO AVOID CONFLICT.</li> <li>PROVIDE A NYLON PULL CORD IN ALL EMPTY CONDUITS.</li> <li>VERIFY ALL CEILING TYPES AND MATERIALS BEFORE ORDERING ANY LIGHTING FIXTURES.</li> </ol>	AIGAUTHORITY HAVING JORISDICTIONMCBMIAID CIRCUIT BREARERAICAMPERE INTERRUPTING CAPACITYM/GMOTOR/GENERATOR SETALCSAUTOMATED LIGHTING CONTROL SYSTEMMHMANHOLEALALUMINUMMINMINIMUMATAMPERE TRIPMLOMAIN LUG ONLYATSAUTOMATIC TRANSFER SWITCHMTDMOUNTEDAWGAMERICAN WIRE GAUGEMTGMOUNTINGAVAUDIO VISUALNNEUTRALBBURIEDNANOT APPLICABLEBFGBELOW FINISHED GRADENCNORMALLY CLOSED CONTACTBOFBOTTOM OF FIXTURENECNATIONAL ELECTRICAL CODECCONDUITNFNOT FUSIBLECACABLENGNATIONAL GRID (ELECTRIC UTILITY)CATCATALOGNLNIGHT LIGHT	ARCHITECTURAL ELEVATIONS FOR COORDINATION.CLG=CEILING MOUNTED.D=ELECTRIC DRYER.W/D=ELECTRIC WASHER/DRYER COMBO UNIT.DE=DUAL ELEMENT FUSES.DW=DISHWASHER.EWC=ELECTRIC WATER COOLER.F=FREEZERGD=GARBAGE DISPOSAL.HD=HAND DRYER .IG=ISOLATED GROUND.M=MICROWAVE.MD=MOTORIZED DAMPER.
<ol> <li>WERT FALL CEREING THE SAND MATERIALS BEFORE OR DRAWINGS ANT EIGHTING FIXTORES.</li> <li>THE LOCATIONS OF HVAC EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. FOR EXACT LOCATIONS REFER TO HVAC DRAWINGS AND SHOP DRAWINGS.</li> <li>CONCEAL ALL WIRING UNLESS OTHERWISE NOTED.</li> <li>PROVIDE ALL GROUNDING INCLUDING GREEN EQUIPMENT GROUND IN ALL RACEWAYS. GROUND BUILDING SERVICE ACCORDING TO NEC AND ALSO TO STREET SIDE OF WATER METER AND TO APPROVED GROUND ROD.</li> <li>CIRCUIT NUMBERS INDICATE PANEL AND CIRCUIT BREAKER FOR EQUIPMENT</li> </ol>	CATVCABLE TELEVISIONNICNOT IN CONTRACTCCTVCLOSED CIRCUIT TELEVISION SYSTEMNONORMALLY OPEN CONTACTCBCIRCUIT BREAKERNTSNOT TO SCALECBACOLOR BY ARCHITECTOPDOVER CURRENT PROTECTION DEVICECDCANDELAPPOLECKTCIRCUITSPHPHASECPUCENTRAL PROCESSING UNITPOSPROVIDED UNDER OTHER SECTIONSCONT.CONTINUATIONPOTSPLAIN ORDINARY TELEPHONECUCOPPERPVCPOLYVINYL CHLORIDE\€CENTERLINEPWRPOWERdBDECIBELRGSRIGID GALVANIZED STEEL	
<ul> <li>CONNECTIONS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO INSTALL ALL REQUIRED WIRING PER NATIONAL ELECTRIC CODE AND PROJECT SPECIFICATIONS TO PROPERLY ENERGIZE THE ELECTRICAL SYSTEM. ALL WIRING SHALL BE RUN IN A NEAT AND ORDERLY MANNER.</li> <li>14. WIRING SHALL NOT BE LAID ON, OR ATTACHED TO THE SUSPENDED CEILING OR ITS SUPPORT WIRES. ALL CABLES SHALL BE RUN PARALLEL OR PERPENDICULAR TO WALLS. DO NOT RUN CABLES DIAGONALLY THROUGH ANY SPACE.</li> </ul>	DCDIRECT CURRENTRIECRHODE ISLAND ELECTRICAL CODEDNDOWNRMSROOT MEAN SQUARE VALUEDWGDRAWINGRPMREVOLUTIONS PER MINUTEECELECTRICAL CONTRACTORSNSOLID NEUTRALECPSEMPTY CONDUIT WITH PULLSTRINGSSSECURITYEGEQUIPMENT GROUNDSWBDSWITCHBOARDELEVELEVATIONTTBTELEPHONE TERMINAL BOARDEMTELECTRIC METALLIC TUBINGTELTELEPHONE	<ul> <li>CEILING MOUNTED DUPLEX RECEPTACLE ON NORMAL CIRCUIT.</li> <li>DOUBLE DUPLEX RECEPTACLE ON NORMAL CIRCUIT.</li> <li>DUPLEX GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLE ON NORMAL CIRCUIT.</li> </ul>
<ol> <li>WHERE THE NUMBER OF CURRENT CARRYING CONDUCTORS IN A RACEWAY OR CABLE EXCEEDS THREE, THE ALLOWABLE AMPACITY SHALL BE REDUCED PER NATIONAL ELECTRIC CODE TABLE BASED ON NO DIVERSITY. CONSIDER NEUTRALS TO BE CURRENT CARRYING CONDUCTORS.</li> <li>DO NOT COMBINE CIRCUITS OR USE COMMON NEUTRALS</li> </ol>	EIMELECTRIC METALLIC FORMOTHETHETHEETREXISTING TO REMAINTMLTERMINALFFAHRENHEITTSPTWISTED SHIELDED-PAIRFAFIRE ALARMTVSSTRANSIENT VOLTAGE SURGEFACPFIRE ALARM CONTROL PANELSUPPRESSERFBAFINISH BY ARCHITECTTYPTYPICALFDRFEEDERUGUNDERGROUNDFLAFULL LOAD AMPERESULUNDERWRITERS LABORATORIES	Image: Duplex double ground fault circuit interrupter receptace on Normal circuit.         Image: Duplex double ground fault circuit interrupter receptace on Normal circuit.         Image: Duplex double ground fault circuit.         Image: Duplex double group gr
17. LABEL ("BROTHER P-TOUCH LABELING SYSTEM" OR APPROVED EQUAL) OR ENGRAVE EACH RECEPTACLE PLATE WITH PANEL DESIGNATION AND CIRCUIT NUMBER.	FLMT       FLEXIBLE LIQUID TIGHT METALLIC TUBING       UNO       UNLESS NOTED OTHERWISE         FREQ       FREQUENCY       UON       UNLESS OTHERWISE NOTED         G       GROUND       UPS       UNINTERRUPTIBLE POWER SUPPLY	
<ol> <li>PROVIDE GROUNDING AND BONDING BUSHINGS FOR SERVICE RACEWAYS PER NEC. SIZE THE BONDING JUMPER PER NEC.</li> </ol>	GECGROUNDING ELECTRODE CONDUCTORUTPUNSHIELDED TWISTED-PAIRGFCIGROUND FAULT CIRCUIT INTERRUPTERVVOLTSGNDGROUNDVAVOLT-AMPERE	PE#PROJECTOR CEILING ENCLOSURE; REFER TO PROJECTOR CEILING ENCLOSURE SCHEDULE FOR ADDITIONAL INFORMATION.
19. GROUND ALL TRANSFORMERS ACCORDING TO NEC HANDBOOK (GROUNDING ELECTRODE CONDUCTOR CONNECTION AT TRANSFORMER). SIZE BONDING JUMPER PER NEC.	HHHANDHOLEVOTELEPHONEHPHORSEPOWERVFDVARIABLE FREQUENCY DRIVEHVACHEATING, VENTILATION, AND AIRVSDVARIABLE SPEED DRIVE	SURFACE METAL RACEWAY, EQUAL TO WIREMOLD SERIES 3000. PROVIDE WITH RECEPTACLES AS INDICATED ON PLANS WITH ACCESSORIES (ELBOWS, COVERS, COUPLINGS, ETC.) FOR A CONTINUOUS, COMPLETE INSTALLATION. COLOR BY
20. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS. NO CLAIM FOR EXTRA COMPENSATION SHALL BE ENTERTAINED FOR WORK WHICH A PRELIMINARY EXAMINATION WOULD HAVE REVEALED. THE SUBMISSION OF A BID WILL BE CONSIDERED AS ACKNOWLEDGMENT ON THE PART OF THE BIDDER OF HIS VISITATION TO THE SITE.	CONDITIONINGWWATTSHZHERTZW/WITHIGISOLATED GROUNDWPWEATHERPROOFJBJUNCTION BOXXFMR/TTRANSFORMERKVAKILOVOLT-AMPERE	ARCHITECT, IVORY OR GRAY. SURFACE METAL RACEWAY, EQUAL TO WIREMOLD SERIES 4000. PROVIDE WITH RECEPTACLES AND TECHNOLOGY OUTLETS AS INDICATED ON PLANS WITH ACCESSORIES (ELBOWS, COVERS, COUPLINGS, DIVIDERS, ETC.) FOR A CONTINUOUS, COMPLETE INSTALLATION. COLOR BY ARCHITECT, IVORY OR GRAY.
21. OBTAIN ALL NECESSARY PERMITS AND CERTIFICATES. PRESENT SATISFACTORY PROOF OF FINAL INSPECTION AND APPROVAL BY AUTHORITIES HAVING JURISDICTION.	EXISTING ELECTRICAL EQUIPMENT LEGEND	EMGB ELECTRICAL MAIN GROUNDING BUSBAR.
<ol> <li>MAINTAIN CORRECT PHASE SEQUENCE OF ALL FEEDERS AND CIRCUITS BY ESTABLISHING PHASE IDENTIFICATION AND MAINTAINING CORRECT RELATIONSHIP THROUGHOUT THE SYSTEM. PROVIDE LINE BALANCE WITHIN 10% OF NORMAL LOADS.</li> </ol>	ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT $\searrow$ $\bigcirc$	EGBELECTRICAL GROUNDING BUSBAR.GANNGENERATOR ANNUNCIATOR.SPDSURGE PROTECTIVE DEVICE.
<ol> <li>PROVIDE FLUSH, LOCKING, WEATHERPROOF "WHILE IN USE" TYPE RECEPTACLE ENCLOSURE; C.W. COLE # TL310-WCS-SH-GFCI-CC (FINISH SELECTED BY THE ARCHITECT); TYPICAL FOR ALL EXTERIOR RECEPTACLES.</li> </ol>	$ \underbrace{\overset{\leftarrow}{\searrow}}_{\Sigma} \underbrace{\overset{\times}{\searrow}}_{\Sigma} \underbrace{\overset{\times}{\bigtriangledown}}_{\nabla} \underbrace{\overset{\times}{\Pi}}_{\Pi} \\ \text{BACK WIRING AND CONDUIT BACK TO NEXT ACTIVE OUTLET OR POWER SOURCE.} $	
<ol> <li>PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC ARTICLE 406.12.</li> <li>ALL CIRCUIT BREAKERS SERVING RESIDENTIAL AREAS NOT LIMITED TO LIVING UNITS, APARTMENTS, CONDOMINIUMS, HOTEL/ MOTEL ROOMS, DORM ROOMS, ETC. SHALL BE ARC FAULT CIRCUIT INTERRUPTER (AFCI) TYPE. PROVIDE COMBO AFCI/GFCI CIRCUIT BREAKERS WHERE GFCI PROTECTION IS ALSO REQUIRED PER THE NEC.</li> </ol>	XR $XR$ 	XXX         REFER TO "ELECTRICAL CONNECTION SCHEDULE FOR MECHANICAL EQUIPMENT" IN THIS DRAWING SET FOR ALL CIRCUIT INFORMATION, INCLUDING BUT NOT LIMITED TO BRANCH CIRCUIT WIRING AND CONDUIT SIZE, VOLTAGE, PHASE, MOTOR CONTROL, DISCONNECT SWITCH AND CIRCUIT BREAKER, REFER TO MECHANICAL, PLUMBING, AND FIRE
<ol> <li>SEE LOW VOLTAGE (TELECOMMUNICATIONS, SECURITY, AUDIO/VISUAL, ETC.) DRAWINGS FOR ADDITIONAL SCOPE OF WORK. PROVIDE ALL ASSOCIATED POWER CONNECTIONS AND EMPTY RACEWAY SYSTEM AND BOXES. PROVIDE PLASTIC END BUSHINGS AND PULLSTRINGS IN ALL CONDUITS.</li> <li>ELECTRICAL CONTRACTOR SHALL COORDINATE ALL LOW VOLTAGE</li> </ol>	XD       XD <td< td=""><td>PROTECTION PLANS FOR EXACT EQUIPMENT LOCATIONS.</td></td<>	PROTECTION PLANS FOR EXACT EQUIPMENT LOCATIONS.
<ul> <li>(TELECOMMUNICATIONS, SECURITY, AUDIO/VISUAL, ETC.) DEVICES AND EQUIPMENT LOCATION WITH THE AV CONSULTANT PRIOR TO ROUGH IN.</li> <li>28. ELECTRICAL CONTRACTOR SHALL PROVIDE LOCKABLE DISCONNECTING MEANS FOR ALL</li> </ul>	XW       XW <td< td=""><td></td></td<>	
ELECTRIC SIGNS AND OUTLINE LIGHTING BRANCH CIRCUITS IN ACCORDANCE WITH NEC ARTICLE 600. PROVIDE WEATHERPROOF INSTALLATION WHEN INSTALLED OUTDOORS. COORDINATE WITH SIGN VENDOR FOR EXACT LOCATIONS AND BRANCH CIRCUIT REQUIREMENTS. AT A MINIMUM PROVIDE A 120V, 20A BRANCH CIRCUIT AT AN ACCESSIBLE LOCATION FOR EACH ENTRANCE TO EACH TENANT SPACE FOR A SIGN OR OUTLINE LIGHTING SYSTEM EXCEPT FOR ENTRANCES USED ONLY BY SERVICE PERSONNEL OR EMPLOYEES.	W XW XW XW       PLACE. EXTEND CIRCUIT/WIRING TO NEW ELECTRICAL EQUIPMENT/DEVICE.         Image: Second structure       Image: Second structure         Image: Second structure       Image: S	
EMPLOTEES.	2. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.	
BRANCH CIRCUIT & FEEDER LEGEND	3. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THE CONTINUITY OF ALL EXISTING CIRCUITS WHICH ARE REMAINING.	
ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT	TELECOMMUNICATION LEGEND	
BRANCH CIRCUIT OR FEEDER CONCEALED IN FINISHED AREAS.	ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT	
BRANCH CIRCUIT OR FEEDER CONCEALED IN OR UNDER FLOOR SLAB.     BRANCH CIRCUIT OR FEEDER TURNING UP TOWARDS OBSERVER.     BRANCH CIRCUIT OR FEEDER TURNING DOWN AWAY FROM OBSERVER.	TELECOMMUNICATION OUTLETS: COORDINATE ALL LOCATIONS AND MOUNTING HEIGHTS WITH OWNERS AND TELECOMMUNICATIONS VENDOR PRIOR TO ROUGH-IN; MOUNT VERTICAL OUTLETS AT 18"A.F.F. TO CENTER UNLESS OTHERWISE DIRECTED. THE DESIGNATIONS SHALL APPLY TO ALL OUTLET TYPES:	
CONDUIT STUBBED ABOVE CEILING.     FLEXIBLE CONNECTION TO EQUIPMENT. RACEWAY AND CONDUCTOR RATING TO     MATCH ASSOCIATED BRANCH CIRCUIT OR FEEDER.	C=INDICATES MOUNTED AT 6" ABOVE BACK SPLASH TO BOTTOM, REFER TO ARCHITECTURAL ELEVATIONS.F=INDICATES FLOOR MOUNTED.P=INDICATES MOUNTED AT 47" A.F.F.W=INDICATES MOUNTED AT 54" A.F.F.H=INDICATES MOUNTED AT 82" A.F.F.	
ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT	TELECOMMUNICATIONS OUTLET, REFER TO TELECOMMUNICATIONS CONDUIT DETAIL FOR ADDITIONAL INFORMATION.	
TELECOMMUNICATION TERMINAL BOARD, PROVIDE GRADE "A", 3/4" PLYWOOD COMPLETELY PAINTED WITH FIREPROOF PAINT AS REQUIRED PER CODE.	WIRELESS ACCESS POINT. CEILING OR WALL MOUNTED. REFER TO TELECOMMUNICATIONS CONDUIT DETAIL FOR ADDITIONAL INFORMATION.	
# E###PARTIAL PLAN/DETAIL CALL OUT TAG; TOP NUMBER INDICATES PLAN/DETAIL AND BOTTOM NUMBER INDICATES SHEET CONTAINING PLAN/DETAIL.# E####ELEVATION PLAN CALL OUT TAG; TOP NUMBER INDICATES PLAN/DETAIL AND BOTTOM NUMBER INDICATES SHEET CONTAINING PLAN/DETAIL.		

## GENERAL SCOPE OF WORK NOTE

FIRE ALARM AND LIGHTING WERE NOT INCLUDED IN THE SCOPE OF WORK FOR THIS PROJECT.

## CIRCUIT TRACING NOTE

ELECTRICAL CONTRACTOR SHALL UPDATE ALL EXISTING PANELBOARD DIRECTORIES TO REFLECT ALL CIRCUITS MADE SPARE FROM DEMOLITION. ALL EXISTING CIRCUIT BREAKERS IN ALL EXISTING PANELBOARDS SHOWN ON THE DRAWINGS SHALL BE TRACED OUT AND LABELED IN PANELBOARD OF ORIGIN. ALL CIRCUITS THAT ARE NO LONGER IN USE SHALL BE PULLED BACK TO PANEL OF ORIGIN. ALL CIRCUIT BREAKERS NOT BEING UTILIZED SHALL BE LABELED AS SPARE AND PUT IN THE OPEN (OFF) POSITION.

## AUDIO/VISUAL LEGEND

ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT

AUDIO/VISUAL OUTLETS: COORDINATE ALL LOCATIONS AND MOUNTING HEIGHTS WITH OWNERS AUDIO VISUAL VENDOR PRIOR TO ROUGH-IN; MOUNT TYPICAL OUTLETS AT 18" A.F.F. TO CENTER UNLESS OTHERWISE DIRECTED. THE FOLLOWING DESIGNATIONS SHALL APPLY TO ALL OUTLET TYPES:

- C = INDICATES MOUNTED AT 6" ABOVE BACK SPLASH TO BOTTOM, REFER TO ARCHITECTURAL ELEVATIONS.
- F = INDICATES FLOOR MOUNTED.
- P = INDICATES MOUNTED AT 47" A.F.F. W = INDICATES MOUNTED AT 54" A.F.F.
- H = INDICATES MOUNTED AT 82" A.F.F.
- DISPLAY OUTLET BOX; REFER TO DISPLAY OUTLET DEVICE SCHEDULE FOR ADDITIONAL INFORMATION.
- AUDIO VISUAL OUTLET. NUMBER INDICATES DESIGNATED OUTLET DETAIL. REFER TO TELECOMMUNICATIONS CONDUIT DETAIL FOR ADDITIONAL INFORMATION. SPEAKER, CEILING OR WALL MOUNTED
- Res Contraction VIDEO CAMERA; BY OWNER'S AV VENDOR

(DB)

# # AV AVH

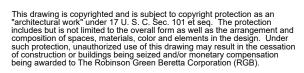
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## POWER DISTRIBUTION LEGEND

	ALL ITEMS SHOWN ARE NOT NECESSARILY USED ON THIS PROJECT
	208Y/120 VOLT PANELBOARD, SURFACE MOUNTED, REFER TO SCHEDULE OF PANELBOARDS.
	208Y/120 VOLT PANELBOARD, FLUSH MOUNTED, REFER TO SCHEDULE OF PANELBOARDS.
	480Y/277 VOLT PANELBOARD, SURFACE MOUNTED, REFER TO SCHEDULE OF PANELBOARDS.
	480Y/277 VOLT PANELBOARD, FLUSH MOUNTED, REFER TO SCHEDULE OF PANELBOARDS.
ATS	AUTOMATIC TRANSFER SWITCH.
T3	DRY TYPE TRANSFORMER. "T3" INDICATES kVA RATING OF TRANSFORMER. REFER TO DRY TYPE TRANSFORMER SCHEDULE.
CT	CURRENT TRANSFORMER CABINET.
CM	E-MON D-MON TENANT METER, OR AS NOTED.
$\fbox$	METER SOCKET AND UTILITY COMPANY ELECTRIC METER, OR AS NOTED.
"MSB"	SWITCHBOARD.
<b>(</b>	ENCLOSED CIRCUIT BREAKER.
Т	TRANSFORMER

## SHEET LIST

SHEET NUMBER	SHEET NAME
E000	ELECTRICAL SYMBOL LISTS, ABBREVIATIONS AND NOTES
E301	ELECTRICAL POWER PLAN - FIRST FLOOR
E302	ELECTRICAL POWER PLAN - SECOND FLOOR
E501	ELECTRICAL RISER DIAGRAM
E601	ELECTRICAL DETAILS
E701	ELECTRICAL SCHEDULES
E801	ELECTRICAL SPECIFICATIONS
E802	ELECTRICAL SPECIFICATIONS, CONT.



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Certification



DD Drawn by Checked by SC

Revised on



HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP. 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616



Architecture · Project Management · Interior Design \_\_\_\_\_

Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

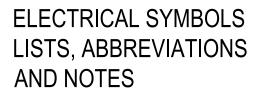
**155 NIAGARA STREET** PROVIDENCE, RI 02907

Drawing Status **ISSUED FOR** CONSTRUCTION

Issued On 04/02/25

Sheet Contents





6844 PROVIDENCE

COMMUNITY CENTER

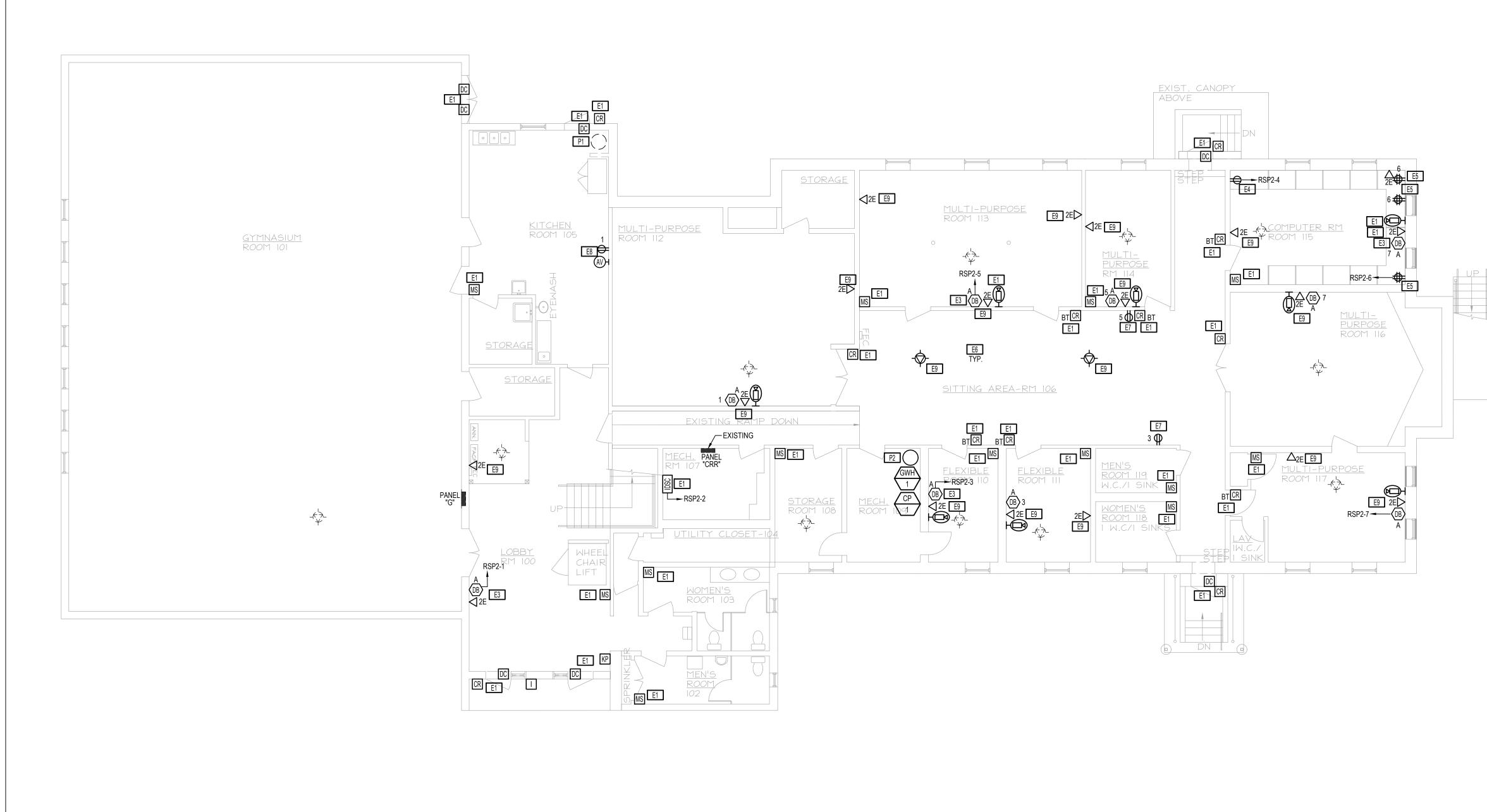
Project Number.

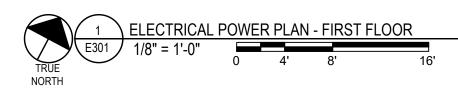
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Drawing No.

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E000





GAS-FIRED WATER HEATER SCHEDULE						
EQUIPMEI	NT NUMBER	GWH-1				
LOCATION	١	MECH. ROOM 109				
MANUFAC	TURER	A.O. SMITH				
MODEL		BL 80				
VENTING	TYPE	ATMOSPHERIC VENT				
STORAGE	CAPACITY	70.3 GAL				
BTU/HR IN	IPUT	75,100 BTU/HR				
GPH @ 10	0° RISE	73 GPH				
THERMAL	EFFICIENCY	81%				
SETPOINT	TEMPERATURE	120°F				
ЧТА	DIAMETER	25-1/4"				
HYS DATA	HEIGHT	58"				
HH	OPERATING WEIGHT	871 LBS				
z	WATER CONN.	3/4" NPT				
CTIO	GAS CONN.	1/2" NPT				
CONNECTION SIZES	COMBUSTION AIR	DRAFT HOOD				
0	EXHAUST AIR					
ELEC DATA	SUPPLY	N/A				
EL	POWER	N/A				

## MECHANICAL CONNECTION SCHEDULE TAG

REFER TO "ELECTRICAL CONNECTION SCHEDULE FOR MECHANICAL EQUIPMENT" IN THIS DRAWING SET FOR ALL CIRCUIT INFORMATION, INCLUDING BUT NOT LIMITED TO BRANCH CIRCUIT WIRING AND CONDUIT SIZE, VOLTAGE, PHASE, MOTOR CONTROL, DISCONNECT SWITCH AND CIRCUIT BREAKER. REFER TO MECHANICAL, PLUMBING, AND FIRE PROTECTION PLANS FOR EXACT EQUIPMENT LOCATIONS.

XXX XX

## LOW VOLTAGE SYSTEM GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SYSTEM OF BOXES AND PATHWAYS FOR ANY TEL/DATA DEVICES SHOWN ON THE DRAWINGS. REFER TO THE FLOOR PLAN DRAWING FOR DEVICE QUANTITY AND LOCATIONS. ALL CONDUITS SHALL BE PROVIDED WITH BUSHINGS ON BOTH ENDS AND A PULL STRING.

2. INCLUDE FIRE STOPPING OF ALL PENETRATIONS ASSOCIATED WITH THE ABOVE SYSTEM.

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		GENERAL POWER SHEET NOTES	
S H	1.	ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.	Any reproduction, possession, or use of this drawing or any part thereof without the express written permission of RGB, is prohibited. Violators will be prosecuted to the full extent of the law.
	2.	COORDINATE EXACT LOCATION OF ALL DEVICES.	Certification
	3.	WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.	
	4.	WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.	03/27/2025 STEVEN COSTA
	5.	ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.	SILVLIN COSTA RHODE SETTE OF LISLAND
	6.	TYPICALLY REFER TO DETAIL 5/E601 FOR DEVICE ELEVATION LOCATIONS PRIOR TO ROUGH-IN.	No. 7813
	7.	COORDINATE MOUNTING HEIGHT OF ALL TECHNOLOGY DEVICES WITH TECHNOLOGY CONTRACTOR PRIOR TO ROUGH-IN.	REGISTERED PROFESSIONAL ENGINEER
	8.	COORDINATE LOCATIONS OF ALL FIRE AND SMOKE RATED WALLS WITH ARCHITECT AND PROVIDE PROPER METHOD OF PENETRATION FOR EACH.	(ELECTRICAL)
		PLUMBING KEYED SHEET NOTES	Drawn by DD Checked by SC
	P1	REMOVE EXISTING GAS WATER HEATER AND ASSOCIATED DOMESTIC PIPING, VALVES AND COMPONENTS. CAP DOMESTIC WATER MAINS ABOVE CEILING. CUT AND CAP NATURAL GAS PIPING BACK TO MAIN. DEMO VENT PIPING AND SEAL PIPE PENETRATIONS.	Revised on
	P2	RE-ROUTE NATURAL GAS PIPING, HOT, AND COLD WATER FROM NEW GAS WATER HEATER TO EXISTING MAINS. RECONNECT RE-CIRCULATION LINE AND RE-USE RE-CIRCULATION PUMP, IF POSSIBLE. REPLACE IN KIND IF REQUIRED. WATER HEATER TO BE VENTED PER MANUFACTURERS SPECIFICATIONS. SEE GAS WATER HEATER SCHEDULE ON THIS SHEET FOR MORE INFORMATION. SEE DETAIL 6 ON E601 FOR MORE INFORMATION.	
		ELECTRICAL KEYED SHEET NOTES	
	E1	INTRUSION DETECTION CONTROL PANEL AND SECURITY DEVICE LOCATIONS ARE DIAGRAMMATIC. COORDINATE WITH OWNER'S SECURITY VENDOR DRAWINGS TO VERIFY ALL DEVICE LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S SECURITY VENDOR PRIOR TO ROUGH-IN.	
	E2	A/V EQUIPMENT LOCATIONS ARE DIAGRAMMATIC. COORDINATE WITH OWNER'S A/V VENDOR DRAWINGS TO VERIFY ALL DEVICE LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S A/V VENDOR PRIOR TO ROUGH-IN.	
	E3	DISPLAY BOX FOR TV/DATA INSTALLATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT FOR EACH BOX, PRIOR TO ROUGH-IN.	<b>Creative</b>
	E4	INSTALL RECEPTACLE FOR PRINTER. COORDINATE FINAL LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.	DIVISION OF THE RISE GROUP
	E5	INSTALL (3) RECEPTACLES FOR COMPUTER POWER IN ROOM 115. COORDINATE FINAL LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN.	HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP. 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910
	E6	INTERIOR DOORS TO HAVE WIRELESS LOCKS. COORDINATE HARDWARE SETS AND FINAL LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN.	OFFICE - 401.438.7733 CEC No: 20240616
]	E7	INSTALL RECEPTACLES FOR POWER IN ROOM 106. COORDINATE FINAL LOCATIONS WITH ARCHITECT PRIOR TO ROUGH-IN.	50 Holden Street Providence, Rhode Island 02908 Phone: (401) 272-1730
	E8	INSTALL RECEPTACLE AND A/V JACK FOR MOBILE CART, PROVIDED BY OWNER (CURRENT USE). COORDINATE WITH OWNER'S A/V VENDOR PRIOR TO ROUGH-IN.	Fax: (401) 273-7156 E-mail: rgbinfo@rgb.net
	E9	TELECOM DEVICE LOCATIONS ARE DIAGRAMMATIC. COORDINATE WITH OWNER'S TELECOMMUNICATIONS VENDOR DRAWINGS TO VERIFY ALL DEVICE LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S TELECOMMUNICATIONS VENDOR PRIOR TO ROUGH-IN.	www.rgb.net Architecture · Project Management · Interior Design Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## 155 NIAGARA STREET PROVIDENCE, RI 02907

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## ELECTRICAL POWER PLAN - FIRST FLOOR

Project Number.

Drawing No.

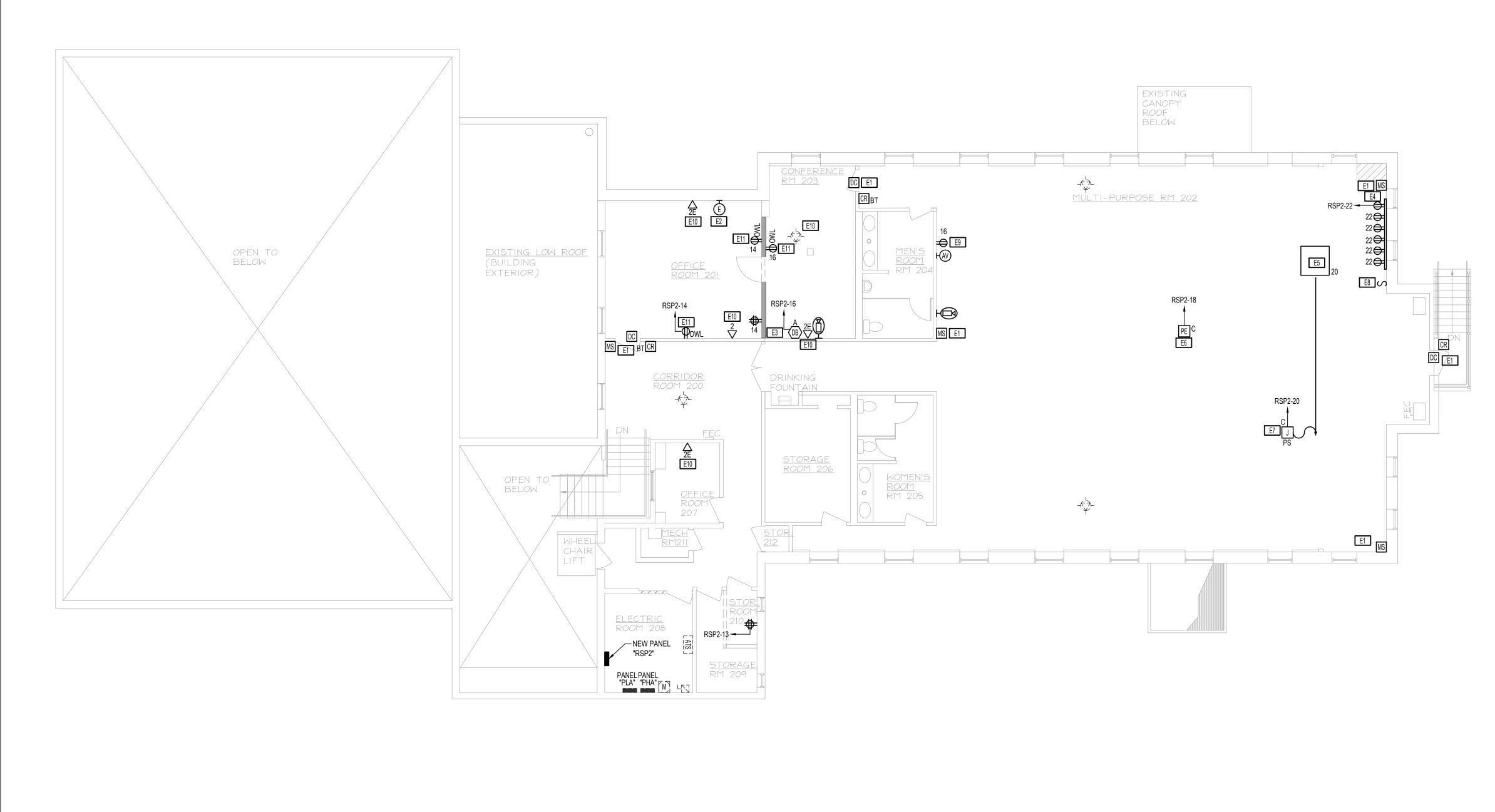
E301

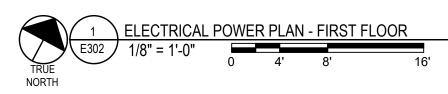
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Sheet

of





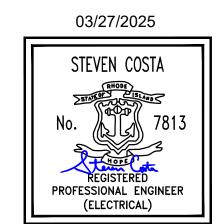
## 

	GENERAL POWER SHEET NOTES	
1.	ALL BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE MC 98% CONDUCTIVITY, COPPER MINIMUM #12 AWG SIZE THWN/THHN INSULATION, 600 VOLTS RATED UNLESS OTHERWISE NOTED.	
2.	COORDINATE EXACT LOCATION OF ALL DEVICES.	
3.	WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.	
4.	WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.	
5.	ALTHOUGH ALL BRANCH CIRCUIT WIRE AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM BE INSTALLED.	
6.	TYPICALLY REFER TO DETAIL 5/E601 FOR DEVICE ELEVATION LOCATIONS PRIOR TO ROUGH-IN.	
7.	COORDINATE MOUNTING HEIGHT OF ALL TECHNOLOGY DEVICES WITH TECHNOLOGY CONTRACTOR PRIOR TO ROUGH-IN.	
8.	COORDINATE LOCATIONS OF ALL FIRE AND SMOKE RATED WALLS WITH ARCHITECT AND PROVIDE PROPER METHOD OF PENETRATION FOR EACH.	
	LOW VOLTAGE SYSTEM GENERAL NOTES	
	THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SYSTEM OF BOXES AND PATHWAYS FOR ANY TEL/DATA DEVICES SHOWN ON THE DRAWINGS. REFER TO THE FLOOR PLAN DRAWING FOR DEVICE QUANTITY AND LOCATIONS. ALL CONDUITS SHALL BE PROVIDED WITH BUSHINGS ON BOTH ENDS AND A PULL STRING.	
2. I	NCLUDE FIRE STOPPING OF ALL PENETRATIONS ASSOCIATED WITH THE ABOVE SYSTEM.	
	KEYED SHEET NOTES	
E1	SECURITY DEVICE LOCATIONS ARE DIAGRAMMATIC. COORDINATE WITH OWNER'S SECURITY VENDOR DRAWINGS TO VERIFY ALL DEVICE LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S SECURITY VENDOR PRIOR TO ROUGH-IN.	
E2	PANIC BUTTON LOCATION IS DIAGRAMMATIC. COORDINATE WITH ARCHITECT AND OWNER'S SECURITY VENDOR DRAWINGS TO VERIFY DEVICE LOCATION. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S SECURITY VENDOR PRIOR TO ROUGH-IN.	
E3	DISPLAY BOX FOR TV/DATA INSTALLATIONS. COORDINATE FINAL LOCATIONS WITH ARCHITECT FOR EACH BOX, PRIOR TO ROUGH-IN.	
E4	INSTALL POWER WIREMOLD IN ROOM 202 AT WALL SHOWN COORDINATE FINAL LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.	
E5	COORDINATE POWER REQUIREMENTS FOR PODIUM WITH ARCHITECT.	
E6	JUNCTION BOX FOR PROJECTOR AT CEILING. COORDINATE FINAL POWER REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH-IN.	
E7	JUNCTION BOX FOR POWER CONNECTION AT CEILING TO MOTORIZED PROJECTOR SCREEN. COORDINATE FINAL POWER REQUIREMENTS WITH ARCHITECT PRIOR TO ROUGH-IN.	
E8	LOW VOLTAGE CONTROL SWITCH FOR MOTORIZED PROJECTOR SCREEN. REFER TO MOTORIZED SCREEN MANUFACTURER INSTRUCTIONS FOR APPROPRIATE CONTROL AND POWER REQUIREMENTS. COORDINATE FINAL LOCATION WITH ARCHITECT.	
E9	INSTALL RECEPTACLE AND A/V JACK FOR MOBILE CART, PROVIDED BY OWNER (FUTURE USE). COORDINATE WITH OWNER'S A/V VENDOR PRIOR TO ROUGH-IN.	
E10	TELECOM DEVICE LOCATIONS ARE DIAGRAMMATIC. COORDINATE WITH OWNER'S TELECOMMUNICATIONS VENDOR DRAWINGS TO VERIFY ALL DEVICE LOCATIONS AND QUANTITIES. ELECTRICAL CONTRACTOR TO COORDINATE POWER REQUIREMENTS WITH OWNER'S TELECOMMUNICATIONS VENDOR PRIOR TO ROUGH-IN.	

E11 INSTALL RECEPTACLE FOR OWL DEVICE. COORDINATE FINAL LOCATION WITH ARCHITECT. COORDINATE POWER REQUIREMENTS WITH OWNER'S TELECOMMUNICATIONS VENDOR PRIOR TO ROUGH-IN.



Certification



DD Drawn by Checked by SC

Revised on



HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP. 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616



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Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## 155 NIAGARA STREET PROVIDENCE, RI 02907

Drawing Status

## **ISSUED FOR** CONSTRUCTION

Issued On 04/02/25 Sheet Contents

## ELECTRICAL POWER PLAN - SECOND FLOOR

Project Number.

Drawing No.

E302

6844

Sheet

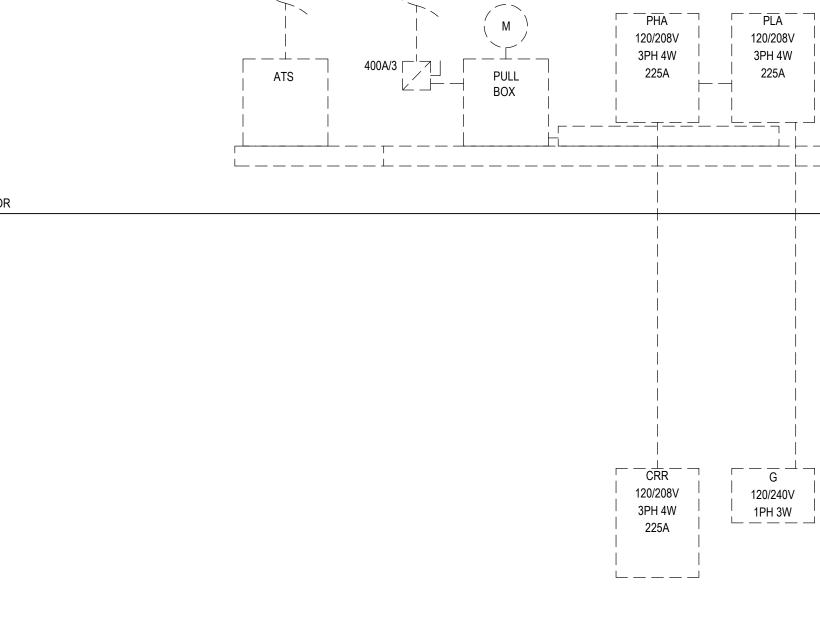
of







FIRST FLOOR



RSP2 120/208V

3 PH, 4W, 150A

- EXTEND EXISTING WIREWAY AS REQUIRED

1PH 3W

SECOND FLOOR

## **KEYED SHEET NOTES**

1 TAP EXISTING SERVICE CONDUCTORS UTILIZING THE NEC 25' TAP RULE. LENGTH OF TAP CONDUCTORS SHALL NOT EXCEED 25'. TAPS SHALL BE MADE UTILIZING ILSCO INSULATED MECHANICAL LUGS.

			FEEDER SIZES S (90 DEGREE CELSIUS)			This drawing is copyrighted and is subject to copyright protection as an "architectural work" under 17 U. S. C. Sec. 101 et seq. The protection includes but is not limited to the overall form as well as the arrangement and
FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE CONDUIT	CONDUCTORS (3 PHASE, 4 WIRE) WITH GROUND	RACEWAY SIZE CONDUIT	NOMINAL AMPERE RATING	composition of spaces, materials, color and elements in the design. Under such protection, unauthorized use of this drawing may result in the cessation of construction or buildings being seized and/or monetary compensation being awarded to The Robinson Green Beretta Corporation (RGB). Any reproduction, possession, or use of this drawing or any part thereof without the express written permission of RGB, is prohibited. Violators will be prosecuted to the full extent of the law.
C1	3#6 & 1#10G.	3/4"				© RGB 2025
C2			4#6 & 1#10G.	1"	50	Certification
C3	3#6 & 1#10G.	3/4"				03/27/2025
C4			4#6 & 1#10G.	1"	60	STEVEN COSTA
C5	3#4 & 1#8G.	1"				
C6			4#4 & 1#8G.	1.25"	70	No. 7813
C7	3#2 & 1#8G.	1.5"				
C8			4#2 & 1#8G.	1.5"	100	REGISTERED PROFESSIONAL ENGINEER
C9	3#1 & 1#6G.	1.5"				(ELECTRICAL)
C10			4#1 & 1#6G.	1.5"	125	
C11	3#1/0 & 1#6G.	1.5"				
C12				2"	150	Drawn by DD Checked by SC
C13	3#2/0 & 1#6G.	2"	-			
C14			4#2/0 & 1#6G.	2"	175	Revised on
C15	3#3/0 & 1#6G.	2"				
C16				2"	200	
C17	3#4/0 & 1#4G.	2"				
C18		2	4#4/0 & 1#4G.	2.5"	225	
C19	3#250 KCMIL & 1#4G.	2.5"	4#4/0 & 1#40.	2.5		
	3#250 KGMIL & 1#46.	2.5		2.5"	250	
C20		01	4#250 KCMIL & 1#4G.	2.5		
C21	3#350 KCMIL & 1#4G.	3"			300	
C22			4#350 KCMIL & 1#4G.	3"		
C23	3#500 KCMIL & 1#3G.	3.5"			350	
C24			4#500 KCMIL & 1#3G.	4"		Creative 💥
C25	3#600 KCMIL & 1#3G.	3.5"			400	DIVISION OF THE RISE GROUP
C26			4#600 KCMIL & 1#3G.	4"		HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP.
C27	2 SETS (3#250 KCMIL & 1#2G.)	(2) 2.5"			500	195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616
C28			2 SETS (4#250 KCMIL & 1#2G.)	(2) 3"		50 Haldan Street
C29	2 SETS (3#350 KCMIL & 1#1G.)	(2) 3"			600	Providence, Rhode Island
C30			2 SETS (4#350 KCMIL & 1#1G.)	(2) 3"		Phone: (401) 272-1730 Fax: (401) 273-7156
C31	2 SETS (3#600 KCMIL & 1#1/0G.)	(2) 3.5"			800	www.igb.itet
C32			2 SETS (4#600 KCMIL & 1#1/0G.)	(2) 4"		Architecture · Project Management · Interior Design
C33	3 SETS (3#400 KCMIL & 1#2/0G.)	(3) 3"			1000	Project
C34			3 SETS (4#400 KCMIL & 1#2/0G.)	(3) 3"	╢────┤	ELMWOOD COMMUNITY
C35	3 SETS (3#600 KCMIL & 1#3/0G.)	(3) 3.5"			1200	CENTER
C36			3 SETS (4#600 KCMIL & 1#3/0G.)	(3) 4"	╢────┤	
C37	4 SETS (3#600 KCMIL & 1#4/0G.)	(4) 3.5"			1600	BUILDING
C38			4 SETS (4#600 KCMIL & 1#4/0G.)	(4) 4"		RENOVATIONS
C39	5 SETS (3#600 KCMIL & 1#250 KCMIL G.)	(5) 3.5"			2000	
C40			5 SETS (4#600 KCMIL & 1#250 KCMIL G.)	(5) 4"		
C41	6 SETS (3#600 KCMIL & 1#350 KCMIL G.)	(6) 3.5"			2500	
C42			6 SETS (4#600 KCMIL & 1#350 KCMIL G.)	(6) 4"	2000	
C43	8 SETS (3#600 KCMIL & 1#400 KCMIL G.)	(8) 3.5"			3000	
C44			8 SETS (4#600 KCMIL & 1 #400KCMIL G.)	(8) 4"	3000	
C45	10 SETS (3#600 KCMIL & 1#500 KCMIL G.)	(10) 3.5"			4000	
C46			10 SETS (4#600 KCMIL & 1 #500KCMIL G.)	(10) 4"	4000	
CURRENT	CARRYING CONDUCTORS PER RACEWAY IN AN AMBIENT	NOT TO EXCEED 30 DI	LLOWED BASED UPON NEC TABLE 310.15(B)(16) WITH NO EGREES C. FEEDER TAGS MAY BE OVERSIZED FOR THE A			155 NIAGARA STREET PROVIDENCE, RI 02907
2. RACEWAY	ON TO ACCOUNT FOR DERATING FACTORS OR LIMIT VOL SIZES ARE THE MINIMUM ALLOWED BASED UPON NEC TA SINSULATION SYSTEMS AND BACEWAY TYPES TO LIMIT F	ABLE C1 FOR THHN/THV	VN CONDUCTORS IN EMT. RACEWAY SIZES SHALL BE INCP	REASED TO ACCOMMO	DATE	Drawing Status

- FEEDERS DESIGNATED IN MULTIPLE SETS SHALL HAVE THE REQUIRED SETS INSTALLED IN PARALLEL.

RACEWAY SIZES ARE THE MINIMUM ALLOWED BASED UPON NEC TABLE C1 FOR THHN/THWN CONDUCTORS IN EMT. RACEWAY SIZES SHALL BE INCREASED TO ACCOMMODATE DIFFERING INSULATION SYSTEMS AND RACEWAY TYPES TO LIMIT RACEWAY FILL TO LESS THAN 40%.

## STREET , RI 02907

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## ELECTRICAL ONE LINE DIAGRAM

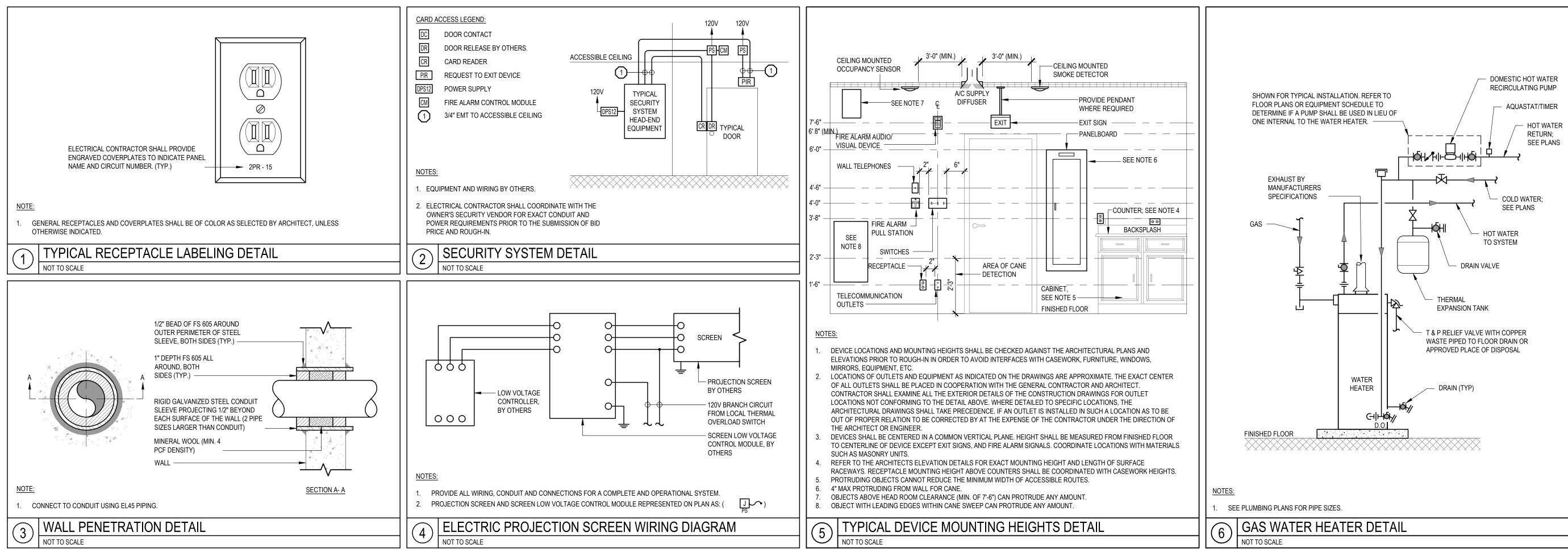
Project Number. 6844

Drawing No.

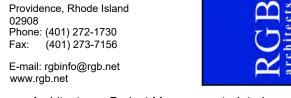
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<b></b>	03/27/2025	1
	STEVEN COSTA	813
Drawn by	DD	
Checked by	SC	
DIVISION HVAC - ELEC D/B/A	OF THE RISE GROUP CTRICAL - PLUMBING - F A CREATIVE ENVIRONMI CES AVE BLDG. #2 CRAI OFFICE - 401.438.77 CEC No: 20240616	FIRE PROTECTION ENT CORP. NSTON RI 02910
50 Holden Stree Providence, Rhe	et	$\sim$



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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

**155 NIAGARA STREET** PROVIDENCE, RI 02907

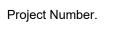
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## ELECTRICAL DETAILS

6844

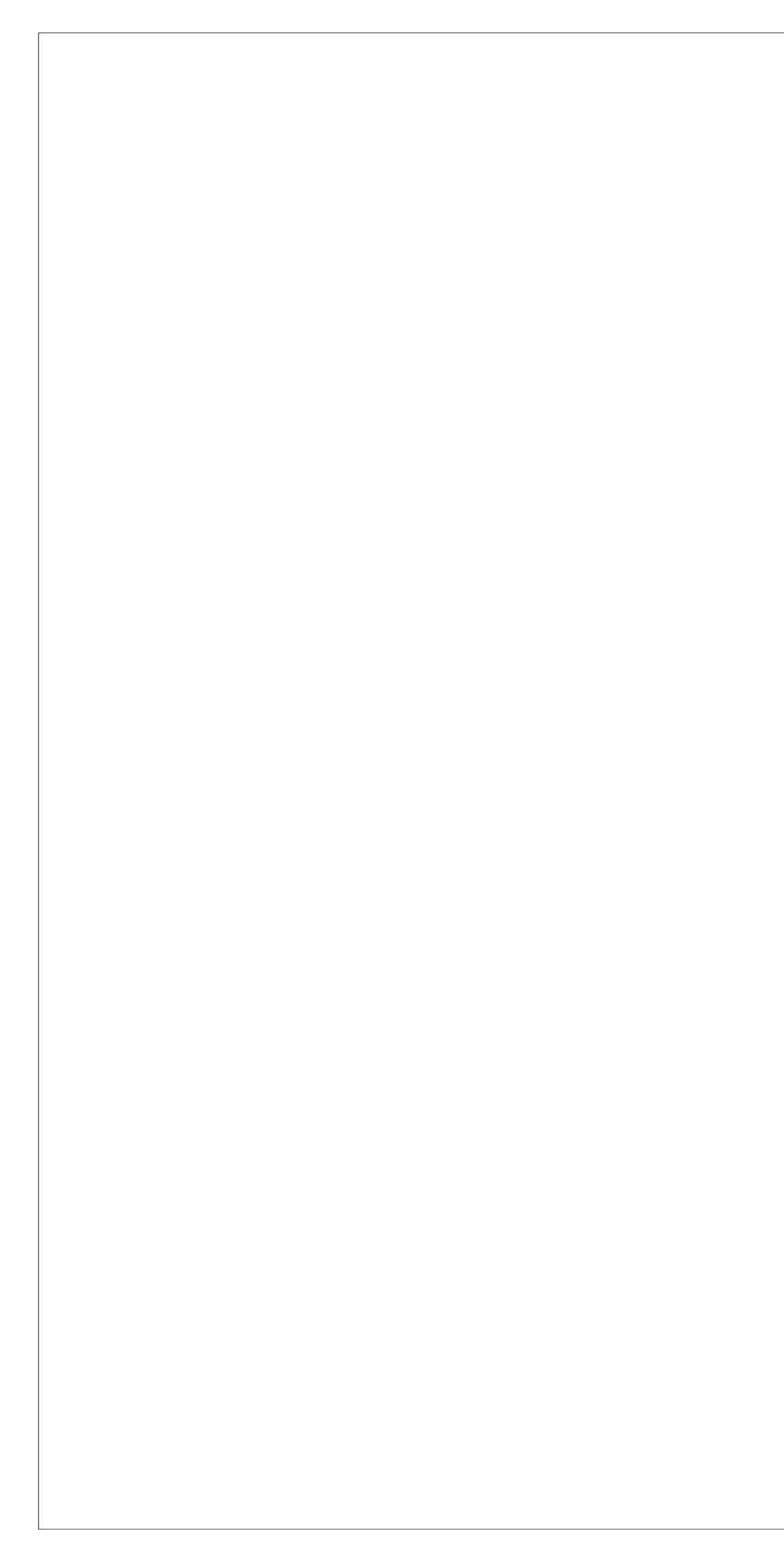


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E601



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				includes but is not limited to the o									This drawing is copyrighted and is subject to copyright protection as an "architectural work" under 17 U. S. C. Sec. 101 et seq. The protection includes but is not limited to the overall form as well as the arrangement and composition of spaces, materials, color and elements in the design. Under such protection, unauthorized use of this drawing may result in the cessation of construction or buildings being seized and/or monetary compensation being awarded to The Robinson Green Beretta Corporation (RGB).	
			2. PROVIDE	ALL REQUIRED MANUF	T; PROVIDE FLUSH COVE FACTURER ACCESSORIE	S FOR A COMPI	LETE INSTALLATI	ion of Indica	TED DEVICES AND COMPONENTS.					Any reproduction, possession, or use of this drawing or any part thereof without the express written permission of RGB, is prohibited. Violators will be prosecuted to the full extent of the law.
			TYPE	MANUFACTURER	SERIES	GANG QUANTITY	POWER	CONDUIT SIZE	TELECOMMUNICATIONS	CONDUIT SIZE	AUDIO/VISUAL & MISC	CONDUIT SIZE	NOTES	03/27/2025
			A	WIREMOLD	EFB84	4	(2) DUPLEX	3/4"	(1) GANG; BY OWNERS VENDOR	1"	(1) GANG; BY OWNERS VENDOR	1"	1,2,3	STEVEN COSTA
				,		E	BRANCH	CIRCU	IT PANELS SCHEDULE					No. 7813
<ol> <li>PROVIDE W</li> <li>PANEL SHA</li> <li>ALL CIRCUI NEC.</li> <li><u>NOTES 5-11 ARE</u></li> <li>INTERRUPT</li> <li>PROVIDE W</li> <li>BRANCH GF</li> <li>BRANCH GF</li> <li>BRANCH SH</li> <li>BRANCH AF</li> <li>BRANCH AF</li> <li>PROVIDE D</li> </ol>	LL BE FULLY RATED T BREAKERS SERVI OPTIONS WHICH S ING CAPABILITY BY ITH 120V SHUNT TR ROUND FAULT CIRC ROUND FAULT CIRC HUNT TRIP BREAKEF RC FAULT CIRCUIT II UAL FUNCTION AFC	MMODATE CON DUNLESS NOTE ING RESIDENTIA HALL BE SPECII UL LISTED SER IP MAIN CIRCUI UIT INTERRUPT TH LEAKAGE BR R (120V COIL); Q NTERRUPTER B I/GFCI TYPE BR	5 REFERENCED IN THI AL AREAS NOT LIMITED FICALLY INDICATED IN IES RATED SYSTEM. P T BREAKER. ER BREAKER RATED FOR EAKER RATED FOR 30 TY. AND RATING IN PAI REAKER; QTY. AND RA EAKER; TYPICAL FOR	E NOTES SECTION. TO LIVING UNITS, APAI NOTES SECTION FOR II ROVIDE NAMEPLATES I OR 4-6 ma FOR PERSON ma FOR EQUIPMENT PF RENTHESIS. I.E.: 9 (3-60 TING IN PARENTHESIS. ALL LOAD CENTERS.	NCLUSION: IN ACCORDANCE WITH N NAL PROTECTION; QTY. AND R NOTECTION; QTY. AND R M1)	MS, HOTEL/ MO IEC REQUIREM AND RATING IN ATING IN PARE	TEL ROOMS, DOF ENTS IDENTIFYIN PARENTHESIS. I. NTHESIS. I.E.: 8 (2	RM ROOMS, E IG SERIES RA .E.: 7 (4-20/1) 2-30/1)	TC. SHALL BE ARC FAULT CIRCUIT INTERRUP	TER (AFCI) TYPE. P	ROVIDE COMBO AFCI/GFCI CIRCUIT BREAKER	S WHERE GFCI PRO	TECTION IS ALSO REQUIRED PER THE	PROFESSIONAL ENGINEER (ELECTRICAL) Drawn by DD Checked by SC Revised on
DESIGNATION	LOCATION	MTG.	BUS MAIN		STICS		Solated Fee Ground The Bus Lug	RU PROTE	TIVE TOTAL 1POLE		CUIT BREAKERS		NOTES	
RSP-2	ELECTRICAL ROOM 208	SURFACE	AMPS         MCB           225         150	- 120/208	3 4 100K	NO	NO NO	D YE	15       20       25       30       35       40       45       45         6       42       -       24       -       -       -       -	60 60 15 20 25 30 	0       35       40       45       50       60       15       20       25       30       35       40       45       50         -	-	5	
			• • • •			ELEC	TRICAL	CONNE	CTION SCHEDULE FOR	R MECHAN	NICAL EQUIPMENT	• •		
		1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	"FLEX" DENOTES FINA "CP" DENOTES FINAL "REC" PROVIDE RECE "WP" INDICATES PRO MOTOR-RATED SWITC NOTES 8-20 ARE OPT DISCONNECT PROVID PROVIDE MOTOR STA PROVIDE VARIABLE F ELECTRICAL CONTRA PROVIDE 120V POWE	RING METHODS SHALL I AL THREE FEET (MAXIN CONNECTION TO BOX EPTACLE IN THE NEMA VIDE WEATHERPROOF CH SHALL HAVE THERN IONS WHICH SHALL BE DED INTEGRAL (PREWIF ARTER, SEE COMBINAT REQUENCY DRIVE, REI ACTOR SHALL WIRE VIA R TO LEAK DETECTION	BE AS NOTED ON THE DI IUM) OF RACEWAY SHAL OR CONTROL PANEL PR CONFIGURATION NOTED INSTALLATION OF RACE IAL OVERLOAD ELEMEN SPECIFICALLY NOTED IN RED) TO EQUIPMENT BY ION MOTOR STARTER SO FER TO VFD SCHEDULE ASSOCIATED CONTROL I FROM NEAREST RECEP	L BE FLEXIBLE EWIRED TO THI D. PROVIDE GFC WAY SYSTEM. TS SIZED PER T N REMARKS FOI OTHERS. CHEDULE FOR N FOR MORE INFO PANEL. TACLE CIRCUIT	Metal or Liquii E Equipment. I Type at Outdo He Manufactui R Inclusion. More Informat Drmation.	DTIGHT META OOR LOCATIC RER'S RECOM 'ION.	L CONDUIT. NS, KITCHEN AREAS, OR WITHIN 6'-0" OF A SI IMENDATIONS.	νK.				DIVISION OF THE RISE GROUP HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP.

PROVIDE 30 MA GFCI CIRCUIT BREAKER FOR HEAT TRACE APPLICATIONS.
 ELECTRICAL CONTRACTOR SHALL WIRE EXHAUST FAN VIA LINE VOLTAGE T-STAT FURNISHED BY THE MECHANICAL CONTRACTOR.

15. ELECTRICAL CONTRACTOR SHALL PROVIDE 2#12+#12G-3/4"C. TO AQUASTAT, FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR.

16. DISCONNECT SHALL BE PROVIDED WITH AUXILIARY CONTACTS AND CONTROL WIRING BACK TO PERMISSIVE CONTACTS AND ASSOCIATED VFD FOR DISCONNECT POSITION INTERFACE (ON OR OFF). 17. ELECTRICAL CONTRACTOR SHALL WIRE EXHAUST FAN VIA LINE VOLTAGE VARIABLE SPEED SWITCH FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED AND WIRE BY THE ELECTRICAL CONTRACTOR. 18. PROVIDE WEATHERPROOF GFCI RECEPTACLE AND WEATHERPROOF LIGHT FIXTURE AT UNIT. SEE ASSOCIATED DETAIL FOR ADDITIONAL INFORMATION.

19. INDOOR UNIT POWERED FROM OUTDOOR UNIT. WIRE PER THE MANUFACTURER'S RECOMMENDATIONS . PROVIDE SERVICE SWITCH TO DISCONNECT ALL POWER AND CONTROL. 20. ELECTRICAL CONTRACTOR SHALL PROVIDE AT MINIMUM 4 #12+1 #12G IN 3/4"C. FROM ELEVATOR CONTROL PANEL TO THE ATS FOR PRE-TRANSFER SIGNALS, WHEN THE ELEVATOR IS WIRED TO AN EMERGENCY SYSTEM.

				EQUIP	MENT CH	ARACTER	ISTICS				CIRCUIT						CC	DNNECTI	ON				NOTES				
	TAG# DESCRIPTION		i			i				PANEL/ CIRCUIT	BREAKER	FEEDER AND CONDUIT EQUIPMENT LOCATION				0	DISCONNECT SWITCH				NOTES						
					VOLTS	TS PHASE	FLA	MCA	MOCP	HP	KVA	CFM		SIZE			FLEX	CP	REC.	ST	SIZE	FUSE	POLE	NEMA	WP		
GWH-1	GAS WATER HEATER	-	-	-	-	-	-	-	-	-	-	-	MECH ROOM 109	-	-	-	-	-	-	-	-	-	-				
CP-1	CIRCULATOR PUMP	120	1	-	-	-	-	-	-	RSP2-23	20A-1P	3#12+1#12G. IN 3/4"C	MECH ROOM 109	Y	-	-	-	-	-	-	-	-	-				

ECTION 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616



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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## 155 NIAGARA STREET PROVIDENCE, RI 02907

Drawing Status

## **ISSUED FOR** CONSTRUCTION

Issued On 04/02/25 Sheet Contents

## ELECTRICAL SCHEDULES

Project Number.

NICHOLAS J. CAMPIA

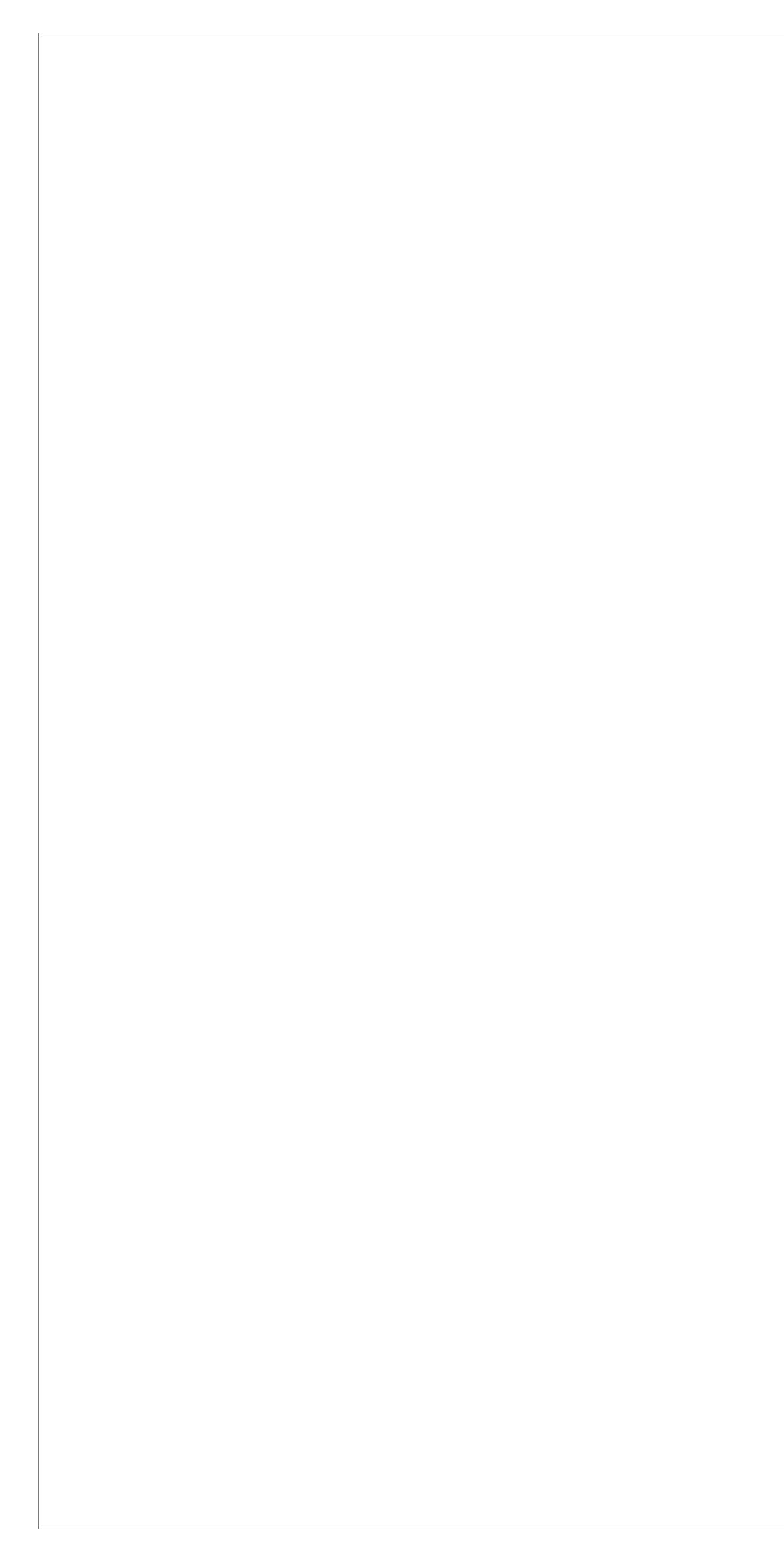
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

Drawing No.

E701

6844

Sheet of



## ELECTRICAL SPECIFICATIONS:

### PART 1 - GENERAL

### 1.1. GENERAL REQUIREMENTS:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE ARRANGEMENT, DETAILS AND LOCATION AS INDICATED ON THE CONTRACT DOCUMENTS, REFERENCE DRAWINGS AND ANY SUPPLEMENTAL ADDENDA, BULLETINS OR DRAWINGS ISSUED BY THE ARCHITECT/ENGINEER. LAYOUTS ARE DIAGRAMMATIC AND FINAL ARRANGEMENT OF EQUIPMENT SHALL SUIT FIELD CONDITIONS. REFER TO ALL DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT FOR THE EXACT LOCATION OF ALL EQUIPMENT AND REQUIRED MOUNTING HEIGHTS PRIOR TO THE START OF ANY ROUGHING. THE RIGHT IS RESERVED TO MAKE ANY REASONABLE CHANGE IN LOCATION TO OUTLETS AND EQUIPMENT PRIOR TO ROUGHING AT NO ADDITIONAL EXPENSE TO THE OWNER.

### 1.2. SCOPE OF WORK:

1. THE SCOPE OF WORK CONSISTS OF THE INSTALLATION OF ALL MATERIALS TO BE FURNISHED UNDER THIS SECTION, AND WITHOUT LIMITING THE GENERALITY THEREOF, CONSISTS OF FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, STORAGE, TRANSPORTATION, RIGGING, STAGING, APPURTENANCES AND SERVICES NECESSARY AND/OR INCIDENTAL TO PROPERLY COMPLETE ALL ELECTRICAL WORK SHOWN ON THE DRAWINGS, AS DESCRIBED IN THE SPECIFICATIONS, OR AS REASONABLY INFERRED FROM EITHER, IN THE OPINION OF THE ARCHITECT/ENGINEER AS BEING REQUIRED.

### 1.3. <u>SITE VISIT:</u>

BIDDERS ARE ADVISED TO VISIT THE SITE AND INFORM THEMSELVES AS THE TO CONDITIONS UNDER WHICH THIS WORK WILL BE PERFORMED. FAILURE TO DO SO WILL, IN NO WAY, RELIEVE THE SUCCESSFUL BIDDER FROM THE RESPONSIBILITY OF FURNISHING ANY MATERIALS OR PERFORMING ANY WORK IN ACCORDANCE WITH THE TRUE INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS. 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 SHOWN ON DRAWINGS. ARRANGEMENTS SHALL BE MADE WITH THE OWNER PRIOR TO THE VISIT FOR INSPECTION OF THE WORK AREA(S).

### 1.4. RELATED WORK:

- 2. THE FOLLOWING RELATED WORK IS NOT INCLUDED UNDER THIS SECTION AND SHALL BE PROVIDED UNDER OTHER SECTIONS. COORDINATE WITH ALL DIVISIONS TO ENSURE A COMPLETE INSTALLATION:
- A. CUTTING AND PATCHING.
- B. ACCESS PANELS.
- C. FIELD PAINTING.D. TELECOMMUNICATION WIRING AND DEVICES UNLESS SPECIFICALLY NOTED ON
- DRAWINGS OR IN SPECIFICATIONS.
- E. AUTOMATIC TEMPERATURE CONTROL AND DIRECT DIGITAL WIRING UNLESS SPECIFICALLY NOTED ON DRAWINGS OR IN SPECIFICATIONS.

### 1.5. DEFINITIONS:

- "CONCEALED" SHALL BE DEFINED AS AREAS WHERE CONDUIT AND WIRING IS LOCATED IN CHASES, WALLS, PARTITIONS, SHAFTS, AND ABOVE FINISHED CEILINGS.
   "UNDERGROUND" SHALL MEAN CONDUIT AND WIRING EXTERIOR TO OR WITHIN THE BUILDING THAT IS BURIED. ALL OTHER CONDUIT AND WIRING SHALL BE CONSIDERED
- "EXPOSED". 3. "EXPOSED" SHALL MEAN CONDUIT AND WIRING RUN ON THE SURFACE OF THE BUILDING
- CONSTRUCTION.
  4. "CONDUIT" SHALL MEAN IN ADDITION TO CONDUIT, ALL FITTINGS, HANGERS AND OTHER ACCESSORIES RELATING TO SUCH CONDUIT SYSTEMS.
- 5. "WIRING" SHALL MEAN WIRE, RACEWAY, BOXES AND FITTINGS. 6. "PROVIDE" SHALL MEAN "PROVIDED COMPLETE IN PLACE" THAT IS "ELIRNISHED AN
- 6. "PROVIDE" SHALL MEAN "PROVIDED COMPLETE IN PLACE" THAT IS, "FURNISHED AND INSTALLED."

### 1.6. CODES, REGULATIONS, AND PERMITS:

1. ALL WORK UNDER THIS SECTION SHALL CONFORM TO THE LATEST EDITIONS OF THE LOCAL STATE BUILDING CODE, THE STATE ELECTRICAL CODE, NFPA, ANSI/NECA INSTALLATION STANDARDS, AND ALL OTHER LOCAL GOVERNING CODES. GIVE NOTICES, FILE PLANS, OBTAIN AND PAY FOR PERMITS AND LICENSES AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION. PERMITS SHALL BE SECURED THROUGH THE CITY. DELIVER CERTIFICATES OF INSPECTIONS TO ARCHITECT/ENGINEER. NO WORK SHALL BE COVERED BEFORE EXAMINATION AND APPROVAL BY ARCHITECT/ENGINEER AND THE AUTHORITIES HAVING JURISDICTION. IMPERFECT OR CONDEMNED WORK SHALL BE REPLACED WITH WORKING CONFORMING TO REQUIREMENTS AT NO ADDITIONAL COST TO THE OWNER, SUBJECT TO APPROVAL OF THE ARCHITECT/ENGINEER. IF WORK IS COVERED BEFORE DUE INSPECTION AND APPROVAL THE ELECTRICAL CONTRACTOR SHALL PAY COSTS OF UNCOVERING THE INSTALLED WORK, WHETHER IT MEETS CONTRACT REQUIREMENTS OR NOT.

### 1.7. <u>MATERIALS:</u>

1. ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS SECTION SHALL BE NEW AND OF THE BEST GRADE FOR THE SERVICE INTENDED. IT IS NOT INTENDED THAT THESE SPECIFICATIONS OR DRAWINGS SHOW EVERY CONDUIT, FITTING, AND APPURTENANCE. ALL SUCH PARTS NECESSARY FOR THE COMPLETE EXECUTION OF THE WORK, IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE AND TO THE SATISFACTION OF THE ARCHITECT/ENGINEER SHALL BE PROVIDED WHETHER THESE PARTS MAY HAVE SPECIFICALLY MENTIONED OR NOT, OR INDICATED ON THE DRAWINGS.

### 1.8. SHOP DRAWINGS:

1. WHERE THE DRAWINGS OR SPECIFICATIONS LIST SPECIFIC BRANDS OR CATALOG NUMBERS, ONLY THESE PRODUCTS MAY BE USED UNLESS THE WORDS: "OR APPROVED EQUAL" OR "BUT ARE NOT LIMITED TO" ARE INCLUDED. THE ENGINEER'S REVIEW IS FOR GENERAL CONFORMANCE WITH THE DESIGN INTENT. MARKINGS OR COMMENTS SHALL NOT BE CONSTRUED AS RELIEVING THE ELECTRICAL CONTRACTOR FROM COMPLIANCE WITH DRAWINGS AND SPECIFICATIONS, NOR DEPARTURES THEREOF. THE ELECTRICAL CONTRACTOR REMAINS RESPONSIBLE FOR DETAILS AND ACCURACY, FOR CONFORMING AND CORRECTNESS OF ALL QUANTITIES AND DIMENSIONS, FOR SELECTING FABRICATING PROCESSES, FOR TECHNIQUES OR ASSEMBLY, AND FOR PERFORMING THEIR WORK IN A SAFE MANNER. DEVIATIONS TO SPECIFIED MATERIALS SHALL BE AT THE SOLE RISK OF THE ELECTRICAL CONTRACTOR, WHO SHALL BE RESPONSIBLE FOR ALL ASSOCIATED CHANGES TO THIS AND OTHER TRADES. WITHIN THIRTY (30) DAYS AFTER THE DATE OF NOTICE TO PROCEED, AND BEFORE THE PROCUREMENT OF ANY MATERIALS AND EQUIPMENT, SUBMIT FOR APPROVAL A COMPLETE ITEMIZED LIST OF ALL THE MATERIALS AND EQUIPMENT INCORPORATED UNDER THIS SECTION. ALL SHOP DRAWING SUBMITTALS SHALL BE COMPLETE AND INCLUDE ALL PART 2 PRODUCTS AND VFDS OF THIS SPECIFICATION AND BE CLEARLY IDENTIFIED. NO CONSIDERATION WILL BE GIVEN TO PARTIAL SUBMITTALS, EXCEPT WITH PRIOR APPROVAL.

### 1.9. OPERATIONS AND MAINTENANCE MANUALS

- 1. AT LEAST TWO (2) WEEKS PRIOR TO THE TIME OF TURNING OVER HIS CONTRACT TO THE OWNER FOR USE AND OCCUPANCY OR SUBSTANTIAL COMPLETION, SECURE AND DELIVER TO THE ARCHITECT/ENGINEER THREE (3) COMPLETE INDEXED BOUND FILES CONTAINING APPROVED OPERATING AND MAINTENANCE MANUALS, SHOP DRAWINGS, AND OTHER DATA AS FOLLOWS:
- A. OPERATION DESCRIPTION OF ALL SYSTEMS.
- B. COMPLETE SHOP DRAWINGS OF ALL EQUIPMENT.
- C. PREVENTIVE MAINTENANCE INSTRUCTIONS FOR ALL SYSTEMS.
- D. SPARE PARTS LISTS OF ALL SYSTEM COMPONENTS.E. NAMES, ADDRESS AND TELEPHONE NUMBERS OF ALL SUPPLIERS OF THE SYSTEMS.
- NON-AVAILABILITY OF OPERATING AND MAINTENANCE MANUALS OR INACCURACIES THEREIN MAY BE GROUNDS FOR CANCELLATION AND POSTPONEMENT OF ANY SCHEDULED FINAL INSPECTION BY THE OWNER UNTIL SUCH TIME AS THE DISCREPANCY HAS BEEN CORRECTED AND/OR RETAINAGE OF SUFFICIENT MONIES TO PREPARE SAME.

### 1.10. RECORD DRAWINGS:

OWNER'S RECORD DRAWINGS SHALL BE UPDATED AS THE PROJECT PROGRESSES. MAINTAIN DOCUMENTS IN SAFE, DRY LOCATION. INDICATE CLEARLY AND ACCURATELY ANY CHANGES NECESSITATED BY FIELD CONDITIONS AND DIMENSION ALL CONCEALED RACEWAYS. THE ELECTRICAL CONTRACTOR SHALL DELIVER THE COMPLETED REPRODUCIBLE RECORD DRAWINGS AND CAD DISKS PROPERLY TITLED AND DATED TO ARCHITECT/ENGINEER. THESE RECORD DRAWINGS SHALL BECOME THE PROPERTY OF THE OWNER.

### 1.11. CHANGE ORDERS/PROPOSAL REQUEST:

- 2. DURING THE COURSE OF CONSTRUCTION, CHANGES IN THE WORK MAY OCCUR. WHEN A SIGNIFICANT CHANGE IS TO BE MADE, A PROPOSAL REQUEST WILL BE ISSUED.
- 3. PROVIDE A COMPLETE COST BREAKDOWN WHEN RESPONDING TO EACH PROPOSAL REQUEST.
- 4. EACH ITEM OF WORK TO BE PRICED SEPARATELY.
- 5. EACH LINE ITEM TO BE BROKEN DOWN INCLUDING QUANTITIES AND LISTING SEPARATELY LABOR AND MATERIAL.
- BOTH CREDITS AND EXTRAS SHALL BE SEPARATELY AND CLEARLY QUANTIFIED.
   ALLOWANCES FOR OVERHEAD AND PROFIT SHALL BE AS LISTED IN THE SUPPLEMENTARY
- CONDITIONS.
  8. IF YOU BECOME AWARE OF A FIELD CONDITION, CODE REQUIREMENT, ERROR, OR OMISSION THAT YOU FEEL SHOULD RESULT IN A CHANGE TO THE WORK, PLEASE CONTACT THE ENGINEER FOR DISCUSSION. THE ENGINEER MAY BE ABLE TO CLARIFY THE SITUATION AND AVOID UNNECESSARY PAPERWORK.
- IT IS RECOGNIZED THAT THE OWNER BENEFITS WHEN THE CONSTRUCTION PROCESS IS A COOPERATIVE EFFORT INSTEAD OF AN ADVERSARIAL RELATIONSHIP. REASONABLE GIVE-AND-TAKE ALLOWS THE CONSTRUCTION PROCESS TO MOVE SMOOTHLY. YOUR EFFORTS IN THIS REGARD WILL BE APPRECIATED BY ALL PARTIES.

### 1.12. GUARANTEE AND SERVICE:

1. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE THE PERFORMANCE OF THE INSTALLATION AND ALL EQUIPMENT INCLUDED IN THIS SECTION IN WRITING FOR ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE ENGINEER. SHOULD ANY DEFECTS IN MATERIALS OR WORKMANSHIP APPEAR DURING THIS PERIOD, THEY SHALL BE CORRECTED OR REPLACED BY THE ELECTRICAL CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT/ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.

### 1.13. COORDINATE WITH OTHER TRADES:

1. CONFER WITH OTHER TRADES AND FURNISH IN WRITING TO THE ARCHITECT/ENGINEER ANY INFORMATION NECESSARY TO PERMIT THE WORK OF ALL TRADES TO BE INSTALLED SATISFACTORILY AND WITH THE LEAST POSSIBLE INTERFERENCE OR DELAY. WORK INSTALLED THAT CREATED INTERFERENCE OR RESTRICTS ACCESS REQUIRED BY CODE OR TO CONDUCT MAINTENANCE AND/OR ADJUSTMENTS SHALL BE MODIFIED AT NO ADDITIONAL COST TO THE OWNER. FURNISH TO OTHER TRADES ANY INFORMATION REQUIRED FOR THE PURPOSE OF COORDINATING ADJACENT WORK.

### 1.14. SLEEVES, INSERTS, AND SUPPORTS

1. THE ELECTRICAL CONTRACTOR SHALL LAYOUT AND INSTALL HIS WORK IN ADVANCE OF THE POURING OF CONCRETE FLOORS AND WALLS. WHERE OPENINGS ARE REQUIRED IN WALLS AND FLOORS FOR THE PASSING OF RACEWAYS, DUCTS OR BUSWAYS, THE ELECTRICAL CONTRACTOR SHALL FURNISH THE GENERAL CONTRACTOR WITH THE NECESSARY INFORMATION REGARDING DIMENSIONS AND LOCATIONS SO THAT HE MAY INSTALL SUITABLE CONCRETE STOPS TO PROVIDE THESE OPENINGS. SUCH OPENINGS SHALL BE BY THE GENERAL CONTRACTOR IN SUCH A MANNER SO AS NOT TO INTERFERE WITH THE FIREPROOF INTEGRITY OF THE BUILDING. THE ELECTRICAL CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE LOCATION OF AND MAINTAINING IN PROPER POSITION, SLEEVES, INSERTS AND ANCHOR BOLTS SUPPLIED AND/OR SET IN PLACE BY HIM. IN THE EVENT THAT FAILURE TO DO SO REQUIRES CUTTING AND PATCHING OF FINISHED WORK, SUCH WORK SHALL BE DONE AT THE ELECTRICAL CONTRACTOR'S EXPENSE BY THE GENERAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL INSERTS, CONDUIT HANGERS, ANCHORS AND STEEL SUPPORTS NECESSARY FOR THE SUPPORT AND INSTALLATION OF ALL ELECTRICAL EQUIPMENT.

### 1.15. CUTTING AND PATCHING:

INCLUDE ALL CORING, CUTTING, PATCHING AND FIREPROOFING NECESSARY FOR THE EXECUTION OF THIS SECTION. STRUCTURAL ELEMENTS SHALL NOT BE CUT WITHOUT WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER. REPAIR AND PATCH AROUND THE WORK SPECIFIED HEREIN TO MATCH THE EXISTING ADJACENT SURFACES TO THE SATISFACTION OF THE ARCHITECT/ENGINEER. FILL AND PATCH ALL OPENINGS OR HOLES LEFT IN THE EXISTING STRUCTURES BY THE REMOVAL OF EXISTING EQUIPMENT THAT IS PART OF THIS SECTION OF THE SPECIFICATIONS. APPLY FIRESTOPPING TO CABLE AND RACEWAY SLEEVES AND OTHER PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL UNDISTURBED FIRE-RESISTANCE RATINGS OF ASSEMBLIES.

### 1.16. HOISTING, SCAFFOLDING AND PLANKING:

 INCLUDE THE FURNISHING, SETUP-UP AND MAINTENANCE OF ALL HOISTING MACHINERY, CRANES, SCAFFOLDS, STAGING AND PLANKING AS REQUIRED FOR THE EXECUTION OF WORK FOR THIS SECTION.

### 1.17. SAFETY REQUIREMENTS:

1. LIFE SAFETY AND ACCIDENT PREVENTION SHALL BE A PRIMARY CONSIDERATION. COMPLY WITH ALL SAFETY REQUIREMENTS OF THE OWNER AND OSHA THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD OF THE PROJECT. FURNISH, PLACE AND MAINTAIN PROPER GUARDS AND ANY OTHER NECESSARY CONSTRUCTION REQUIRED TO SECURE SAFETY OF LIFE AND PROPERTY.

### 1.18. ACCESSIBILITY:

1. ALL WORK PROVIDED UNDER THIS SECTION SHALL BE PROVIDED SO THAT PARTS REQUIRING PERIODIC INSPECTION, MAINTENANCE AND REPAIR ARE READILY ACCESSIBLE, WORK OF THIS TRADE SHALL NOT INFRINGE UPON THE CLEARANCES OF OTHER TRADES.

### 1.19. PROTECTION OF WORK AND PROPERTY:

1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND THE PROTECTION OF ALL WORK INCLUDED UNDER THIS SECTION UNTIL THE COMPLETION AND FINAL ACCEPTANCE OF THIS PROJECT. PROTECT ALL EQUIPMENT AND MATERIALS FROM DAMAGE FROM ALL CAUSES INCLUDING, BUT NOT LIMITED TO, FIRE, VANDALISM, AND THEFT. ALL MATERIALS AND EQUIPMENT DAMAGED OR STOLEN SHALL BE REPAIRED OR REPLACED WITH EQUAL MATERIAL OR EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER. PROTECT ALL EQUIPMENT, OUTLETS AND OPENINGS, AND ROOF PENETRATIONS WITH TEMPORARY PLUGS, CAPS AND COVERS. PROTECT WORK AND MATERIALS OF OTHER TRADES FROM DAMAGE THAT MIGHT BE CAUSED BY WORK OR WORKMEN UNDER THIS SECTION AND MAKE GOOD ON DAMAGE THUS CAUSED. DAMAGED MATERIALS SHALL BE REMOVED FROM THE SITE; DAMAGE CAUSED BY THE ELECTRICAL CONTRACTOR DURING INSTALLATION SHALL BE REPAIRED AND/OR REPLACED AT THIS CONTRACTOR'S EXPENSE TO THE COMPLETE SATISFACTION OF THE BUILDING OWNER.

### 1.20. SEISMIC RESTRAINT REQUIREMENTS:

1. PROVIDE SEISMIC RESTRAINTS AS REQUIRED IN ACCORDANCE WITH THE STATE BUILDING CODE. A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER, LICENSED IN THE APPLICABLE STATE FOR THE PROJECT LOCATION, SHALL PREPARE THE SEISMIC RESTRAINT DESIGN AND CERTIFY THAT THE DESIGN IS IN COMPLIANCE WITH THE STATE BUILDING CODE REQUIREMENTS. PROVIDE EXPANSION AND DEFLECTION FITTINGS AND HANGERS AS REQUIRED TO ACCOMMODATE BUILDING MOVEMENT DEFINED BY THE BUILDING'S STRUCTURAL ENGINEER.

### 1.21. PROJECT CLOSEOUT:

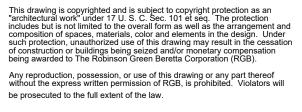
1. A CERTIFICATE OF COMPLETION SHALL BE ISSUED BY THE ELECTRICAL CONTRACTOR INDICATING THAT THE INSTALLATION IS IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND ALL APPLICABLE LOCAL, STATE AND FEDERAL STATUTES AND CODES. FINAL INSPECTION BY THE ENGINEER SHALL BE CONDUCTED AFTER RECEIPT OF THE CERTIFICATE OF COMPLETION. NO LIFE SAFETY DEFICIENCIES IN THE EGRESS OR EXIT LIGHTING SYSTEMS, FIRE ALARM SYSTEM, OR THE EMERGENCY POWER SYSTEM SHALL BE PRESENT WHEN REQUESTING FINAL INSPECTION. PREMATURE REQUESTS FOR FINAL INSPECTIONS THAT REQUIRE REINSPECTION OF DEFICIENT ITEMS WILL RESULT IN BACK CHARGES OF THE COSTS ASSOCIATED WITH THE REINSPECTION.

#### 1.22. TEMPORARY POWER AND LIGHTING:

- 1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND PAY FOR CAPACITY FROM THE LOCAL UTILITY COMPANY POWER LINES, MAKE ARRANGEMENTS WITH THE LOCATION UTILITY COMPANY FOR TEMPORARY SERVICE AS REQUIRED.
- 2. PROVIDE ADEQUATE DISTRIBUTION EQUIPMENT, WIRING, AND OUTLETS FOR POWER AND LIGHTING.
- PROVIDE POWER OUTLETS FOR CONSTRUCTION OPERATIONS, WITH BRANCH WIRING AND DISTRIBUTION BOXES LOCATED AS REQUIRED.
   PROVIDE 20 AMPERE DUPLEX OUTLETS, SINGLE PHASE CIRCUITS FOR POWER TOOLS IN THE ACTIVE WORK AREA AS REQUIRED. PERMANENT CONVENIENCE RECEPTACLES MAY BE UTILIZED DURING THE CONSTRUCTION PROCESS. THE GENERAL CONTRACTOR SHALL PAY
- ALL UTILITY COMPANY USAGE BILLINGS.
  5. PROVIDE GFCI PROTECTED POWER OUTLETS FOR CONSTRUCTION OPERATIONS, WITH PRANCH WIRING AND DISTRIBUTION POYES LOCATED AS REQUIRED.
- BRANCH WIRING AND DISTRIBUTION BOXES LOCATED AS REQUIRED.6. THE ELECTRICAL CONTRACTOR SHALL PROVIDE FOR TEMPORARY LIGHTING, PROVIDING
- AND MAINTAINING OSHA REQUIRED LIGHTING LEVELS FOR CONSTRUCTION OPERATIONS.
  PROVIDE BRANCH WIRING FROM POWER SOURCE TO DISTRIBUTION BOXES WITH LIGHTING CONDUCTORS, PIGTAILS, AND LAMPS AS REQUIRED.
- THE ELECTRICAL CONTRACTOR SHALL MAINTAIN LIGHTING AND PROVIDE ROUTINE REPAIRS AS REQUIRED. PERMANENT BUILDING LIGHTING MAY BE UTILIZED DURING CONSTRUCTION. POWER SHALL BE DERIVED FROM THE EXISTING BUILDING AND KWH USAGE PAID BY THE OWNER.

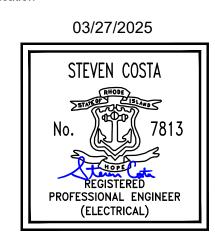
#### 1.23. DRAWINGS AND SPECIFICATIONS:

1. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY EACH TO THE OTHER, AND ANY LABOR OR MATERIAL CALLED FOR BY EITHER, WHETHER OR NOT BY BOTH, OR NECESSARY FOR THE SUCCESSFUL OPERATION OF ANY COMPONENTS SHALL BE PROVIDED. BEFORE INSTALLING ANY WORK, VERIFY THAT IT DOES NOT INTERFERE WITH THE CLEARANCES REQUIRED FOR OTHER WORK. INSTALLED WORK WHICH INTERFERES WITH EXISTING NECESSARY SERVICES SHALL BE MODIFIED AS DIRECTED BY THE ARCHITECT, AT NO ADDITIONAL COST TO THE OWNER. BE FAMILIAR WITH THE DRAWINGS AND SPECIFICATIONS OF ALL OTHER TRADES TO PREVENT INTERFERENCES AND ASSURE COMPLETE COORDINATION. IF THERE ARE ANY DISCREPANCIES BETWEEN THE ELECTRICAL DRAWINGS AND SPECIFICATIONS REQUEST CLARIFICATION FROM THE ARCHITECT/ENGINEER PRIOR TO START AND OR CONTINUATION OF ANY WORK OR THE PROCUREMENT OF ANY MATERIALS AND EQUIPMENT.



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Certification





HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP. 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616

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Architecture · Project Management · Interior Design

Project

ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

155 NIAGARA STREET PROVIDENCE, RI 02907

Drawing Status

## ISSUED FOR CONSTRUCTION

Issued On 04/02/25 Sheet Contents

## ELECTRICAL SPECIFICATIONS

Project Number. 6844

Drawing No.

E80<sup>-</sup>



Sheet o

### PART 2 - PRODUCTS

### 2.1 NOT USED

- 2.2. WIRE AND CABLE:
- 1. WIRING SHALL BE TYPE THHN/THWN OR XHHW, MINIMUM OF #12 AWG SOLID COPPER WITH CONDUCTIVITY OF NOT LESS THAN 98% OF THE ANSI STANDARD FOR ANNEALED COPPER, UL LISTED FOR BUILDING WIRE 90 DEGREES CELSIUS. WET OR DRY LOCATIONS RATED FOR 600V SERVICE. MC AND FAMC CABLING CAN BE USED WHERE CONCEALED. CONDUCTORS LARGER THAN #10 SHALL BE STRANDED. COLOR CODING SHALL BE CONSISTENT THROUGHOUT.

#### 2.3. CONDUIT:

1. ELECTRIC METALLIC TUBING SHALL BE ELECTRO-GALVANIZED SHERARDIZED STEEL. WHERE EXPOSED, ALL WIRING SHALL BE INSTALLED IN CONDUIT. ALL ROUTING OF CONDUIT SHALL BE RUN PERPENDICULAR TO BUILDING WALLS. ALL ELECTRIC METALLIC TUBING SHALL BE UTILIZED WITH STEEL SET SCREW TYPE FITTINGS. CONDUIT SHALL BE SUPPORTED FROM BUILDING STRUCTURE; AND SHALL BE INDEPENDENT OF DUCTS, PIPES, CEILING AND THEIR SUPPORTING MEMBERS.

#### 2.4. MISCELLANEOUS CONDUIT FITTINGS

1. PROVIDE WATER-TIGHT GLAND SEALING ASSEMBLIES WITH PRESSURE BUSHINGS EQUAL TOOZ/GEDNEY TYPE WSK FOR NEW CAST-IN-PLACE INSTALLATIONS OR TYPE CSCM FOR RETROFIT (CORE DRILLING OF EXISTING WALLS) AS REQUIRED FOR BELOW GRADE WALL AND FLOOR PENETRATIONS.

#### 2.5. WIRING DEVICES:

#### 1. LIGHT SWITCHES:

- A. REFER TO DRAWINGS
- B. COLOR OF SWITCHES SHALL BE AS SELECTED BY ARCHITECT.
- 2. OCCUPANCY SENSORS: A. REFER TO DRAWINGS

### RECEPTACLES:

- A. DUPLEX RECEPTACLES SHALL BE SPECIFICATION GRADE GROUNDING TYPE, RATED 20 AMPERES, 125 VOLTS, RECEPTACLES SHALL BE BACK AND SIDE WIRED WITH SCREW TYPE TERMINALS HAVING SUITABLE CONDUCTOR RELEASE ARRANGEMENT. GFCI RECEPTACLES SHALL BE SPECIFICATION GRADE 20 AMPERES, 125 VOLTS.
- B. COLOR OF RECEPTACLES SHALL BE AS SELECTED BY ARCHITECT.

#### 2.6. OUTLET BOXES:

1. PROVIDE OUTLET BOXES AS REQUIRED FOR ALL ELECTRICAL DEVICES AND EQUIPMENT. MINIMUM SIZE OF BOXES SHALL BE 4", 1-1/4" DEEP. ALL OUTLET BOXES SHALL BE GALVANIZED STEEL

#### 2.7. PULL BOXES, JUNCTION BOXES AND WIREWAYS:

- 1. PULL BOXES SHALL BE OF CODE GAUGE GALVANIZED STEEL WITH SCREW COVERS TO MATCH. PULL BOXES AND WIREWAYS SHALL BE AS SHOWN ON CONTRACT DRAWINGS AND/OR AS REQUIRED BY THE NATIONAL ELECTRICAL CODE AND/OR JOB CONDITIONS, WITH STEEL BARRIERS SEPARATING SYSTEMS.
- WIREWAYS SHALL BE OF CODE GAUGE STEEL, BAKED ENAMEL MANUFACTURED STANDARD
- SECTIONS AND STEEL FITTINGS, WITH COMBINATION HINGED AND SCREW COVERS. CONDUCTORS PASSING THROUGH PULL BOXES AND WIREWAYS SHALL BE IDENTIFIED TO
- INDICATE THEIR ORIGIN AND TERMINATION. PROVIDE NAMEPLATES FOR ALL PULL BOXES. 4. WEATHERPROOF JUNCTION BOXES INSTALLED IN GRADE SHALL BE POLYMER CONCRETE
- WITH CASKETED COVER, MINIMUM 6"x8".

#### 2.8. THERMAL SWITCHES:

- 1. THERMAL SWITCHES SHALL BE NEMA TYPE 1 TOGGLE SWITCH FOR NORMAL DUTY WITH
- THERMAL OVERLOAD RELAY. 2. SWITCH ENCLOSURES SHALL BE OF A TYPE APPROVED FOR THE LOCATION AND
- ATMOSPHERE IN WHICH IT IS MOUNTED.
- 3. THERMAL SWITCHES SHALL BE INSTALLED WHERE CALLED FOR OR WHERE REQUIRED BY CODF. 4. THERMAL SWITCHES SHALL BE PROVIDED WITH PILOT WHERE CALLED FOR ON THE

### DRAWINGS.

#### 2.9. CIRCUIT BREAKERS FOR EXISTING PANELBOARDS:

- 1. CIRCUIT BREAKERS SHALL BE EQUAL TO THE EXISTING CIRCUIT BREAKERS AND OF THE SAME MANUFACTURER AS THE EXISTING PANELBOARDS IN WHICH THEY ARE TO BE INSTALLED
- 2. PROVIDE UPDATED TYPEWRITTEN CIRCUIT DIRECTORY CARDS INDICATING AREAS AND DEVICES SERVED BY EACH CIRCUIT IN ALL EXISTING PANELBOARDS PANELS AFFECTED BY THE WORK OF THIS PROJECT.

#### 2.10. TELECOMMUNICATION OUTLETS:

1. FURNISH AND INSTALL TELECOMMUNICATION OUTLETS, BOXES, AND CONDUIT FOR ALL TELECOMMUNICATION OUTLET LOCATIONS INDICATED ON THE DRAWINGS, PROVIDE BACK BOXES, CONDUIT, PULLSTRINGS, ETC. AS PER DRAWINGS.

### 2.11. PANELBOARDS:

- 3. AT EACH LOCATION INDICATED ON THE PLANS, FURNISH AND INSTALL AN APPROPRIATE
- PANEL OF THE AMPACITY AND VOLTAGE RATING SHOWN ON THE DRAWINGS. 4. ALL PANELS SHALL BE OF THE SAFETY DEAD FRONT CIRCUIT BREAKER TYPE FOR SERVICE
- ON THREE PHASES, FOUR WIRE MAINS UNLESS OTHERWISE SPECIFIED. ALL PANELS SHALL BE OF CODE GAUGE STEEL.
- 6. PANELS SHALL BE SURFACE OR FLUSH MOUNTED, AS INDICATED ON THE PLANS, AND INSTALLED SO THAT THE TOP CIRCUIT BREAKER IS NO MORE THAN 6'-0"ABOVE THE FINISHED
- FLOOR. 7. THE PANELBOARDS SHALL BEAR THE UNDERWRITERS' LABORATORIES LABEL.
- 8. ALL BUSES SHALL BE COPPER. 9. ALL PANELBOARDS SHALL HAVE A CIRCUIT DIRECTORY CARD MOUNTED IN A FRAME WITH
- PLASTIC COVER INSTALLED ON THE INSIDE OF THE DOOR. 10. ALL DIRECTORY CARDS SHALL BE PROPERLY FILLED IN, USING A TYPEWRITER, AND
- INDICATING AREAS AND DEVICES SERVED BY EACH CIRCUIT. 11. ALL CIRCUIT BREAKERS SHALL BE OF QUICK-MAKE AND QUICK-BREAK TYPE ON MANUAL OPERATION, TRIP-FREE, AND WITH INVERSE TIME CHARACTERISTICS AND SHALL HAVE BOLTED BUS CONNECTIONS; PLUG-IN CIRCUIT BREAKERS WILL NOT BE ALLOWED.
- 12. PANELBOARD TRIMS SHALL BE DOOR-IN-DOOR DESIGN. 13. TRIMS AND DOORS SHALL BE MADE OF CODE GAUGE, FULL FINISH SHEET STEEL. 14. THE TRIM AND DOORS SHALL BE FACTORY FINISHED ON BOTH SIDES.
- 15. ALL PANELBOARDS SHALL BE KEYED ALIKE. 16. PANELBOARDS SHALL CONTAIN CIRCUIT BREAKERS INDICATED ON PANELBOARD SCHEDULE
- ON THE DRAWINGS. 17. TWO AND THREE POLE BREAKERS SHALL BE COMMON TRIP TYPE.
- 18. ALL PANELBOARDS SHALL BE EQUIPPED WITH A NEUTRAL BAR HAVING ONE SOLDERLESS CONNECTOR FOR EACH CIRCUIT AS INDICATED AND WITH ALL REQUIRED KNOCKOUTS. 19. NEW PANELBOARDS SHALL BE MANUFACTURED BY EATON/CUTLER-HAMMER OR APPROVED
- EQUAL.

### 2.12. DISCONNECT SWITCHES:

- 3. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DISCONNECTING MEANS AS REQUIRED BY THE NATIONAL ELECTRICAL CODE FOR ALL MOTORS.
- 4. MANUAL MOTOR STARTERS SHALL HAVE QUICK MAKE, QUICK BREAK TOGGLE MECHANISMS WITH ALLOWANCE FOR UP TO 10% FIELD ADJUSTMENT TO NOMINAL OVERLOAD HEATER VALUES
- 5. DISCONNECT SWITCHES SHALL BE FUSED OR UNFUSED AS SHOWN ON THE DRAWINGS, OR AS REQUIRED, NEMA TYPE HD SAFETY SWITCHES FOR HEAVY DUTY, WITH INTERLOCKING COVER, SIDE OPERATED WITH PROVISIONS FOR PADLOCKING THE SWITCH HANDLE IN THE OFF POSITION.
- 6. ALL MOTOR ISOLATING SWITCHES INDICATED ON THE DRAWINGS SHALL BE RATED IN HORSEPOWER, AND SHALL BE RATED FOR THE VOLTAGE OF THE MOTOR AND SHALL BE FURNISHED AND INSTALLED AT THE MOTOR LOCATION WHETHER OR NOT THE MOTOR IS WITHIN SIGHT OF THE MOTOR FEEDER DISCONNECTING MEANS.
- 7. DISCONNECT SWITCH ENCLOSURES SHALL BE OF THE PROPER NEMA TYPE FOR THE INTENDED LOCATION AS DEFINED BY NEMA AND SHALL BE PHOSPHATE COATED OR EQUIVALENT CODE GAUGE GALVANIZED SHEET STEEL WITH USAFI NO. 24 DARK GRAY
- BAKED ENAMEL FINISH. 8. FUSES SHALL BE CLASS RK-1 SIZED PER DRAWING AND NAMEPLATE REQUIREMENTS.
- 9. INSTALL REJECTION CLIPS TO PROHIBIT INSTALLATION OF OTHER THAN CURRENT LIMITING FUSES.
- 10. DISCONNECT SWITCHES SHALL BEAR THE UNDERWRITERS' LABORATORIES LABEL AND BE MANUFACTURED BY EATON/CUTLER-HAMMER OR APPROVED EQUAL.

#### PART 3 - EXECUTION

- 1. ALL INTERRUPTIONS AND SHUTDOWNS OF EXISTING ELECTRICAL SYSTEMS AND SERVICES SHALL BE AS SHORT AS POSSIBLE AND AT TIME AND DURATION APPROVED BY THE OWNER AND THE ENGINEER. THE ELECTRICAL CONTRACTOR SHALL INCLUDE ALL PREMIUM TIME ASSOCIATED WITH THE SYSTEM AND SERVICE INTERRUPTIONS AND SHUTDOWNS.
- 1. AT THE COMPLETION OF THE WORK, ALL PARTS OF THE INSTALLATION SHALL BE THOROUGHLY CLEANED. ALL DEVICES, EQUIPMENT, CONDUITS, AND FITTINGS SHALL BE COMPLETELY CLEANED OF GREASE, METAL CUTTINGS, DIRT WHICH MAY HAVE
- ACCUMULATED DURING CONSTRUCTION, AND PROTECTION COVERS. ANY DISCOLORATION OR DAMAGE TO PARTS OF THE BUILDING, ITS FINISH OR FURNISHINGS DUE TO FAILING TO PROPERLY CLEAN THE ELECTRICAL SYSTEM SHALL BE REPAIRED BY THE ELECTRICAL CONTRACTOR WITHOUT COST TO THE OWNER.
- 3. THE ELECTRICAL CONTRACTOR SHALL TEST ALL WORK AND EQUIPMENT AS DIRECTED BY THE ARCHITECT AND AS REQUIRED BY AUTHORITIES HAVING JURISDICTION, FURNISH ALL
- EQUIPMENT, NECESSARY PERSONNEL AND THE ELECTRICAL POWER. 4. THE ENTIRE INSTALLATION SHALL BE TESTED FOR SHORTS, GROUNDS AND OPEN CIRCUITS AND ALL DEFECTS SHALL BE CORRECTED BEFORE ACCEPTANCE OF HIS WORK.
- 5. ALL WORK SHALL BE DEMONSTRATED TO BE IN PROPER OPERATING CONDITION TO THE COMPLETE SATISFACTION OF THE ARCHITECT AND OWNER.

#### 3.3. EQUIPMENT CONNECTIONS:

THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONNECTIONS TO ALL EQUIPMENT REQUIRING ELECTRICAL SERVICE, INCLUDING POWER CABLES, BRANCH CIRCUIT EXTENSIONS, FIRE ALARM CABLES, MOTORS, CONTROLLERS, LIGHTING FIXTURES AND ALL OTHER EQUIPMENT AND SYSTEMS SPECIFIED OR SHOWN ON THE DRAWINGS.

#### 3.4. GROUNDING AND BONDING:

PROVIDE GROUNDING AND BONDING METHODS IN ACCORDANCE WITH NEC CODE ARTICLE 250 AND LOCAL UTILITY COMPANY REGULATIONS.

#### 3.5. CONDUIT WORK:

- 1. ALL WIRING SHALL BE INSTALLED IN HEAVY WALL GALVANIZED RIGID STEEL CONDUIT UNLESS OTHERWISE NOTED BELOW AND RUN CONCEALED EXCEPT AS INDICATED ON THE DRAWINGS
- 2. BRANCH CIRCUIT WIRING IN HUNG CEILINGS, FURRED SPACES OR EXPOSED AND NOT SUBJECT TO PHYSICAL DAMAGE MAY BE INSTALLED IN ELECTRICAL METALLIC TUBING. 3. PANELBOARD FEEDERS MAY BE RUN IN ELECTRICAL METALLIC TUBING WHERE NOT
- SUBJECT TO PHYSICAL DAMAGE EXCEPT PANELBOARD FEEDERS RUN UNDERGROUND OR IN CONCRETE SLABS SHALL BE IN HEAVY WALL GALVANIZED RIGID STEEL CONDUIT AS SPECIFIED ABOVE OR PVC. 4. ALL EXPOSED CONDUIT WHERE INSTALLED EXPOSED BELOW THE 8' LEVEL AND SUBJECT
- TO PHYSICAL DAMAGE SHALL BE RIGID STEEL CONDUIT. PROVIDE RIGID GALVANIZED STEEL CONDUIT SWEEPS, INCLUDING ELBOWS AND CONDUIT
- WHERE STUBBING UP THROUGH CONCRETE. PROVIDE TRANSITION FITTINGS AS REQUIRED. 6. PROVIDE RIGID GALVANIZED STEEL CONDUIT IN ELEVATOR SHAFTS, ELEVATOR MACHINE
- CONTROL ROOMS, AND FIRE PUMP ROOMS.
- 7. TYPE MC CABLE MAY BE USED WHERE REQUIRED FOR "FISHING" INTO EXISTING WALL AND CEILING CAVITIES. PATIENT CARE AREAS OF HEALTHCARE OCCUPANCIES SHALL UTILIZED TYPE HCF MC CABLE FOR SAME EXISTING WALL AND CEILING CONDITIONS.
- 8. CONDUIT EXTENSIONS IN METAL PARTITIONS MAY BE MADE WITH FLEXIBLE METAL CONDUIT, WITH GROUNDING CONDUCTOR
- 9. CONNECTIONS TO PORTABLE AND PERMANENTLY MOUNTED MOTORIZED EQUIPMENT AND MOTORS, AS WELL AS THE EQUIPMENT HOUSING, SHALL BE MADE WITH APPROVED LIQUID TIGHT FLEXIBLE METAL CONDUIT.
- 10. FLEXIBLE CONNECTIONS SHALL BE A MAXIMUM OF 18" LONG AND WITH GROUNDING CONDUCTOR.
- 11. FLEXIBLE CONNECTIONS SHALL BE USED PRIOR TO ATTACHMENT TO EQUIPMENT HOUSINGS
- 12. CONDUIT ENDS SHALL BE CUT SQUARE, THREADED AND REAMED TO REMOVE BURRS AND SHARP EDGES.
- 13. FIELD THREADS SHALL BE OF THE SAME TYPE AND HAVE THE SAME EFFECTIVE LENGTH AS FACTORY CUT THREADS.
- 14. EXCESSIVE EXPOSED THREADS WILL NOT BE ALLOWED.
- 15. TURNS, WHEREVER REQUIRED IN EXPOSED CONDUIT RUNS SHALL BE MADE BY THE USE OF FACTORY-MADE BENDS, OR FIELD MADE BENDS.
- 16. CONDULETS, OR IN THE EVENT OF A MULTIPLICITY OF CONDUITS MAKING THE SAME TURN, A STEEL JUNCTION BOX WITH A REMOVABLE STEEL COVER MAY BE USED.
- 17. OFFSETS AND BENDS FOR CHANGES IN ELEVATION OF EXPOSED CONDUIT RUNS SHALL BE
- MADE AT WALLS OR BEAMS AND NOT IN OPEN SPACES BETWEEN WALLS OR BEAMS. 18. CONDUITS SHALL BE ROUTED SO AS NOT TO INTERFERE WITH THE OPERATION OF
- MAINTENANCE OF ANY EQUIPMENT.
- 19. THE ENTIRE JOB SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER. 20. STEEL SUPPORTS OR RACKS SHALL BE GALVANIZED STEEL CHANNEL AND FITTINGS,
- UNISTRUT, KINDORF, HUSKY PRODUCTS COMPANY, OR EQUAL. 21. ALL CONDUIT WORK SHALL BE CAREFULLY CLEANED AND DRIED INSIDE BEFORE THE
- INSTALLATION OF CONDUCTORS. 22. WIRE SHALL NOT BE PULLED INTO CONDUIT SYSTEM UNTIL BUILDING IS COMPLETED.
- 23. PLUG CONDUIT ENDS TO EXCLUDE DUST, MOISTURE, PLASTER OR MORTAR WHILE BUILDING IS UNDER CONSTRUCTION.
- 24. NO LUBRICANTS OR CLEANING AGENTS WHICH MIGHT HAVE A DELETERIOUS EFFECTS ON CONDUCTOR COVERINGS SHALL BE USED FOR DRAWING CONDUCTORS INTO RACEWAYS.
- 25. DRAWINGS, IN RELATION TO ROUTING OF CONDUITS, ARE DIAGRAMMATIC. 26. THE NUMBER AND SIZE OF CONDUITS AND WIRE SHALL BE FURNISHED AND INSTALLED AS
- INDICATED BY THE DRAWINGS. 27. CONDUITS SHALL BE ROUTED IN THE FIELD SO AS TO BE COORDINATED WITH THE BUILDING
- STRUCTURE. 28. CONCEALED CONDUIT SHALL BE AS SHORT AND DIRECT AS POSSIBLE.
- 29. EXPOSED CONDUIT SHALL BE RUN IN STRAIGHT LINES PARALLEL TO WALLS, BEAMS AND
- COLUMNS AND WITH RIGHT ANGLE BENDS AND STEEL THREADED CONDUIT FITTINGS. 30. ALL CONDUIT IN CONCRETE SLABS SHALL BE RUN ABOVE BOTTOM STEEL REINFORCING, BELOW TOP REINFORCING AND COLUMN TIES.
- 31. CONDUITS PASSING THROUGH FLOORS, WALLS AND BEAMS SHALL BE OF SUCH SIZE, NUMBER AND IN SUCH LOCATIONS SO AS NOT TO IMPAIR THE STRENGTH OF THE CONSTRUCTION.
- 32. AT TIME OF ROUGHING CONDUITS IN CONCRETE SLAB AREA, PRIOR TO POURING OF SLAB, THE ELECTRICAL SUBCONTRACTOR SHALL CONSULT THE STRUCTURAL ENGINEER FOR COORDINATION AND APPROVAL OF SIZE. SPACING AND METHOD OF CONDUIT INSTALLATION IN SLABS AND WALLS, AS WELL AS PENETRATION OF SUCH.
- 33. PARTICULAR ATTENTION SHALL BE GIVEN TO THE INSTALLATION OF CONDUITS AT GROUPED AREAS, SUCH AS PANELBOARD, CABINET AND PULL BOX ENTRANCES.
- 34. ALL METAL CONDUIT BURIED IN THE EARTH OR FILL SHALL BE COATED WITH TWO COATS OF HEAVY ASPHALT PAINT OVER ITS ENTIRE LENGTH, INCLUDING COUPLINGS.
- 35. RACEWAYS IN CEILING SPACES SHALL BE ROUTED IN SUCH AN APPROVED MANNER AS TO ELIMINATE OR MINIMIZE THE NUMBER OF JUNCTION BOXES REQUIRED, BUT ALSO SHALL BE ROUTED IN AN ORDERLY AND ORGANIZED MANNER.
- 36. SUPPORT OF CONDUITS BY USE OF WIRE IS STRICTLY PROHIBITED. 37. CONDUITS SHALL BE SUPPORTED AND SECURED BY CONDUIT SUPPORT DEVICES. 38. WHERE RIGID METAL CONDUIT IS THREADED IN THE FIELD, A STANDARD CONDUIT CUTTING
- DIE PROVIDING 3/4" TAPER PER FOOT SHALL BE EMPLOYED. 39. THREADLESS COUPLING SHALL NOT BE USED ON RIGID METAL CONDUIT EXCEPT WHERE
- SPECIFICALLY ALLOWED BY THE ARCHITECT. 40. RUNNING THREADS SHALL NOT BE USED ON RIGID METAL CONDUIT
- 41. CONDUIT WORK SHALL BE INSTALLED IN SUCH A MANNER TO KEEP EXPOSED THREADS TO AN ABSOLUTE MINIMUM, AND IN NO CASE SHALL MORE THAN THREE THREADS BE LEFT EXPOSED AFTER THE CONDUIT WORK IS MADE UP TIGHT. 42. THIS REQUIREMENT APPLIES TO ALL CONDUIT WORK, INCLUDING CONDUIT BURIED IN EARTH
- OR FILL OR IN CONCRETE. 43. MINIMUM SIZE CONDUIT SHALL BE 1/2" NOMINAL TRADE SIZE.
- 44. A MINIMUM 3/16" DIAMETER TWISTED NYLON PLASTIC TYPE FISH CORD SHALL BE FURNISHED AND INSTALLED IN ALL EMPTY RACEWAYS.
- 45. PROVIDE A TAG ON EACH END OF FISH CORD INDICATING THE LOCATION OF THE OTHER END.

3.1. <u>GENERAL:</u>

### 3.2. CLEANING, ADJUSTING, AND TESTING:

### 3.6. FIRE STOPPING:

- 1. ELECTRICAL INSTALLATIONS IN HOLLOW SPACES, VERTICAL SHAFTS AND VENTILATION OR AIR HANDLING DUCTS SHALL BE SO MADE THAT THE POSSIBLE SPREAD OF FIRE OR
- PRODUCTS OF COMBUSTION WILL NOT BE SUBSTANTIALLY INCREASED. 2. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE-RESISTANCE RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE FIRESTOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE-RESISTANCE RATING. 3.7.
- 3.7. IDENTIFICATION:
- NAMEPLATES SHALL BE FURNISHED AND INSTALLED ON THE METER CENTERS/SWITCHBOARD AND METER CENTERS/SWITCHBOARD CIRCUIT BREAKERS, PANELBOARDS, TRANSFORMERS, JUNCTION BOXES, CABINETS FOR ALL SPECIAL PURPOSE SWITCHES, MOTOR DISCONNECT SWITCHES, STARTERS AND OTHER CONTROLS FURNISHED UNDER THIS CONTRACT, TO DESIGNATE THE EQUIPMENT CONTROLLED AND FUNCTION.
- NAMEPLATES SHALL BE LAMINATED WHITE BAKELITE WITH 1/4" HIGH BLACK RECESSED I FTTFRS. NAMEPLATES SHALL BE SECURELY ATTACHED TO THE EQUIPMENT WITH GALVANIZED 3.
- SCREWS OR RIVETS.
- ADHESIVES OR CEMENTS WILL NOT BE PERMITTED. 5. ALL PULL BOXES AND JUNCTION BOXES SHALL BE IDENTIFIED AS TO SYSTEM AND FUNCTION BY MEANS OF BLACK FIBRE PEN.

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HVAC - ELECTRICAL - PLUMBING - FIRE PROTECTION D/B/A CREATIVE ENVIRONMENT CORP. 195 FRANCES AVE BLDG. #2 CRANSTON RI 02910 OFFICE - 401.438.7733 CEC No: 20240616



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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

## **155 NIAGARA STREET** PROVIDENCE, RI 02907

Drawing Status

## **ISSUED FOR** CONSTRUCTION

Issued On 04/02/25 Sheet Contents

## ELECTRICAL SPECIFICATIONS, CONT

Project Number. 6844

Drawing No.



Sheet



## ABBREVIATIONS

ABBREVIATIONS					
ę	CENTERLINE				
AC	ABOVE COUNTER				
AFF	ABOVE FINISHED FLOOR				
ATR	ALL THREADED ROD				
AWG	AMERICAN WIRE GAUGE				
BFBI	BUILDER FURNISHED - BUILDER INSTALLED				
BMS	BUILDING MANAGEMENT SYSTEM				
С	CONDUIT				
CCTV	CLOSED CIRCUIT TELEVISION				
CFD	CEMENT-FIBER DUCT				
CL	CLOSET				
CLG	CEILING				
COAX	COAXIAL CABLE				
CT	CABLE TRAY				
CTR	CENTER				
DIA	DIAMETER				
DGP	DATA GATHERING PANEL				
DWG EC					
ELEV	ELECTRICAL CONTRACTOR ELEVATOR				
ELEV	ELECTROMAGNETIC INTERFERENCE				
EMT	ELECTRICAL METALLIC TUBING				
EQPT	EQUIPMENT				
FBO	FURNISHED BY OTHERS				
FC	FINISHED CEILING				
FCC	FIRE CONTROL CENTER				
FR	FIRE RATED				
FRP	FIBERGLASS REINFORCED PLASTIC				
GFGI	GOVERNMENT FURNISHED - GOVERNMENT INSTALLED				
GC	GENERAL CONTRACTOR				
GND	GROUND				
HVAC	HEATING VENTILATION & AIR CONDITIONING				
IDF	INTERMEDIATE DISTRIBUTION FRAME				
IMC	INTERMEDIATE METAL CONDUIT - SEE NEC ARTICLE 342				
JB					
LAN					
LEC MDF	LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME				
MDF	MULTI-MODE (OPTICAL FIBER)				
MIN	MOUNTED				
MTG	MOUNTING				
NEC	NATIONAL ELECTRICAL CODE - NFPA 70				
NESC	NATIONAL ELECTRICAL SAFETY CODE				
NIC	NOT IN CONTRACT				
NTS	NOT TO SCALE				
OSP	OUTSIDE PANT				
PNL	PANEL				
PR	PAIRS-NUMBER OF PAIRS IN COPPER CABLE				
PVC	POLYVINYL CHLORIDE				
RM	ROOM				
RMC	RIGID METAL CONDUIT - SEE NEC ARTICLE 344				
RU	RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH				
SCC	SECURITY CONTROL CENTER				
SDF	SECURITY DISTRIBUTION FRAME				
SM					
STP	SHIELDED TWISTED PAIR				
TBD					
TC					
TEL	TELECOMMUNICATION				
TYP					
UON UTP	UNLESS OTHERWISE NOTED UNSHIELDED TWISTED PAIR				
WP	WEATHERPROOF				
VVF					

# TECHNOLOGY LEGEND AND ABBREVIATIONS

## **TELECOM. NOTES**

THE LOCATIONS AND ELEVATIONS OF TECHNOLOGY DEVICES SHOWN ON THESE DRAWINGS ARE SCHEMATIC UNLESS ACTUAL DIMENSIONS ARE SHOWN ON THE DRAWINGS. REFER TO THE ARCHITECTURAL PLANS AND OBTAIN THE APPROVAL OF THE ARCHITECT FOR THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL DEVICES. CONTRACTOR SHALL ENSURE THAT ALL MOUNTING HEIGHTS COMPLY WITH CURRENT ADA REQUIREMENTS.

ABOVE COUNTER DEVICES SHALL BE MOUNTED 8" ABOVE COUNTER OR A MAXIMUM OF 44" AFF (TO TOP OF DEVICE).

PROVIDE SUPPORTS AND ANCHORING FOR PIPING, CONDUIT, DUCTS, EQUIPMENT, AND OTHER NON-STRUCTURAL ELEMENTS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

PROVIDE SOUND PUTTY PADS IN ALL BACK BOXES.

FIRESTOPPING: ALL PENETRATIONS THROUGH RATED WALLS AND FLOORS AND CONDUIT/SLEEVE OPENINGS SHALL BE SEALED WITH MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES, HOT GASSES AND SMOKE WHEN SUBJECTED TO THE REQUIREMENTS OF THE TEST STANDARD SPECIFIC FOR APPLICABLE CODES.

ALL COMMUNICATIONS CONDUIT, CABLE TRAYS, LADDER RACKS AND EQUIPMENT RACKS SHALL BE BONDED TO BUILDING GROUND SYSTEM PER NEC 250 AND ANSI/TIA-607-C.

LABEL ALL CLOSETS, RACKS, FRAMES, CABINETS, TERMINATION BLOCKS, CABLES, TERMINATIONS, RACEWAYS, ETC. IN ACCORDANCE WITH ANSI/TIA-606-C. ALL COMMUNICATIONS RACEWAYS AND PATHWAYS SHALL BE INSTALLED TO

MINIMIZE UNNECESSARY CABLE LENGTHS AND MAINTAIN INDUSTRY STANDARD LENGTH LIMITATIONS FOR HORIZONTAL CABLE DISTRIBUTION (E.G CAT.6), BASIC LINK CABLE LENGTH SHALL NOT EXCEED 295 FT (90M) FOR UTP CABLE, 150 FT (45M) FOR SERIES-6 COAXIAL CABLE.

10. ALL COMMUNICATIONS CABLE SHALL BE PLENUM RATED (CMP), RISER RATED (CMR) AND UNDERGROUND RATED (WATERBLOCK) ACCORDING TO USE AND ENVIRONMENTAL CONDITIONS.

1. PROVIDE PROTECTIVE BUSHINGS ON ALL COMMUNICATIONS CONDUITS AND WHERE CABLING ROUTES THROUGH METAL STUDS.

12. ALL NON-ARMORED FIBER OPTIC CABLE SHALL BE INSTALLED IN APPROVED INNERDUCT.

13. ALWAYS INSTALL LOW-VOLTAGE CABLES IN CONDUITS, CABLE TRAYS, WIREWAYS OR OTHER APPROVED CABLE MANAGEMENT DEVICES OR SYSTEMS. NEVER INSTALL CABLES IN SUCH A MANNER THAT THEY ARE SUPPORTED BY CEILING SYSTEMS (CEILING TILE OR GRID, GYPSUM BOARD, LATH & PLASTER), HVAC DUCTS OR PIPES, LIGHTING FIXTURES, ELECTRICAL CONDUITS OR CABLES, PLUMBING/FIRE PROTECTION PIPES, OR ANY OTHER DEVICES NOT INTENDED FOR THE SUPPORT OF LOW-VOLTAGE CABLING.

14. EXPOSED LOW-VOLTAGE CABLES SHALL NOT BE PAINTED. ANY PAINTED CABLES SHALL BE REMOVED AND REPLACED WITH NEW CABLES. 15. PROVIDE WEATHERPROOF, IN-USE COVER FOR EXTERIOR DATA DEVICES.

16. RACEWAYS AND CABLE SHALL BE RUN CONCEALED IN FINISHED SPACES UNLESS OTHERWISE INDICATED.

17. REUSABLE VELCRO TIES SHALL BE USED TO BUNDLE OR MANAGE CABLES. PLASTIC ZIP TIES ARE NOT APPROVED FOR USE.

18. SIZE AND ORIENTATION OF ALL TELECOM PULL-BOXES SHALL MEET OR EXCEED THE BICSI TDMM REQUIREMENTS.

19. ALL LOW-VOLTAGE CONDUIT LARGER THAN 2" SHALL HAVE A MINIMUM BEND RADIUS OF 10:1 OF THE INSIDE DIAMETER FOR ALL ELBOWS. ALL LOW-VOLTAGE CONDUIT 2" AND SMALLER SHALL HAVE A MINIMUM BEND RADIUS OF 6:1 OF THE INSIDE DIAMETER FOR ALL ELBOWS.

20. ALL CONDUITS AND MICRODUCTS SHALL BE INSTALLED WITH PULL-STRINGS.

## SYMBOLS LEGEND

	RACEWAY LEGEND
——— T ———	TELECOMMUNICATIONS CONDUIT
UT	CONDUITS BELOW GRADE/SLAB OR EMBEDDED IN SLAB
J	CABLES ON J-HOOKS
0	CONDUIT UP
•	CONDUIT DOWN
	CONDUIT STUBBED OUT WITH BUSHING
Ø	CONDUIT CROSS-SECTION
CT	TELECOMMUNICATIONS CABLE TRAY
	TELECOMMUNICATIONS CABLE TRAY

## MISCELLANEOUS SYMBOL LEGEND

<b>#</b>	SHEET KEYNOTE
#	REVISION NUMBER
1 T2.1	CALLOUT NUMBER
TMGB	TELECOM MAIN GROUNDING BUSBAR
TGB	TELECOM GROUNDING BUSBAR

WAP	WIRELESS ACCESS POINT (2) -CAT 6 CABLES
	WALL MOUNTED DATA 1 LOCATION (1) - CAT 6 CABLE
<b>2</b>	WALL MOUNTED DATA 2 LOCATION (2) - CAT 6 CABLES
3	WALL MOUNTED DATA 3 LOCATION (3) - CAT 6 CABLES
4	WALL MOUNTED DATA 4 LOCATION (4) - CAT 6 CABLES
TV	WALL MOUNTED DATA 2 LOCATION - COORDINATE WITH DISPLAY (2) - CAT 6 CABLES (1) - HDMI CABLE
4	FLOOR MOUNTED DATA 4 LOCATION (4) - CAT 6 CABLES
CAM	WALL MOUNTED DATA 1 LOCATION - FOR SECURITY CAMERA (1) - CAT 6 CABLE
CAM	CEILING MOUNTED DATA 1 LOCATION - FOR SECURITY CAMERA (1) - CAT 6 CABLE
	WALL MOUNTED DATA 1 LOCATION - FOR VIDEO INTERCOM (1) - CAT 6 CABLE
GATE	CEILING MOUNTED DATA 1 LOCATION - FOR WIRELESS LOCK GATEWAY (1) - CAT 6 CABLE
E	"E" DENOTES EXISTING OUTLET LOCATIONS

LOW VOLTAGE WIRING DEVICE LEGEND

### NOTES:

- FOR TELECOMMUNICATIONS OUTLETS, PROVIDE BOX WITH CONDUIT FROM BOX TO 3" ABOVE AN ACCESSIBLE CEILING OR INTO THE TELECOM ROOM. INCLUDE PULL STRING AND TERMINATED WITH AN INSULATED BUSHING. BOXES SHALL BE RECESSED. 1"C., 4 11/16" x 2 1/8" BOX WITH 5/8" RAISED SINGLE GANG PLASTER RING. RACO #259 & 843 OR EQUAL.
- 2. FOR TELEPHONE OUTLET, PROVIDE SINGLE GANG BOX AND PLASTER RING BOX WITH 3/4" CONDUIT TERMINATED WITH AN INSULATING BUSHING TO 3" ABOVE AN ACCESSIBLE CEILING OR INTO THE TELECOM ROOM WITH A PULL STRING.
- ALL CONDUITS, BACK BOXES AND PLASTER RINGS WILL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. TELECOMMUNICATIONS CONTRACTOR SHALL COORDINATE AND VERIFY THE OUTLET LOCATIONS BY REFERRING TO THE ARCHITECTURAL DRAWINGS AND DETAILS.
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL OUTLETS.
- TELECOM CONTRACTOR SHALL RUN DATA CABLING FOR SECURITY LOCK GATEWAYS AND VIDEO INTERCOMS. CONTRACTOR TO REFER TO SECURITY DRAWINGS FOR ADDITIONAL INFORMATION.

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LEGEND NOTES

THIS SHEET IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS AND SHALL

BE USED AS A DICTIONARY TO DEFINE ITEMS INDICATED ON DRAWINGS. NOT

ALL SYMBOLS OR ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT.

DRAWING LIST

TELECOM - BASEMENT AND SECOND FLOOR PLAN

**TELECOM - LEGEND AND NOTES SHEET** 

TELECOM - FIRST FLOOR PLAN

**TELECOM - DETAILS SHEET** 

**TELECOM - DETAILS SHEET** 

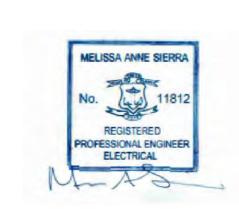
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TC1.00

TC1.01

TC2.00

TC2.01



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ELMWOOD COMMUNITY

**155 NIAGARA STREET** 

PROVIDENCE, RI 02907

LEGEND AND NOTES

Project Number. 6844 PROVIDENCE

**TC0.01** 

COMMUNITY CENTER

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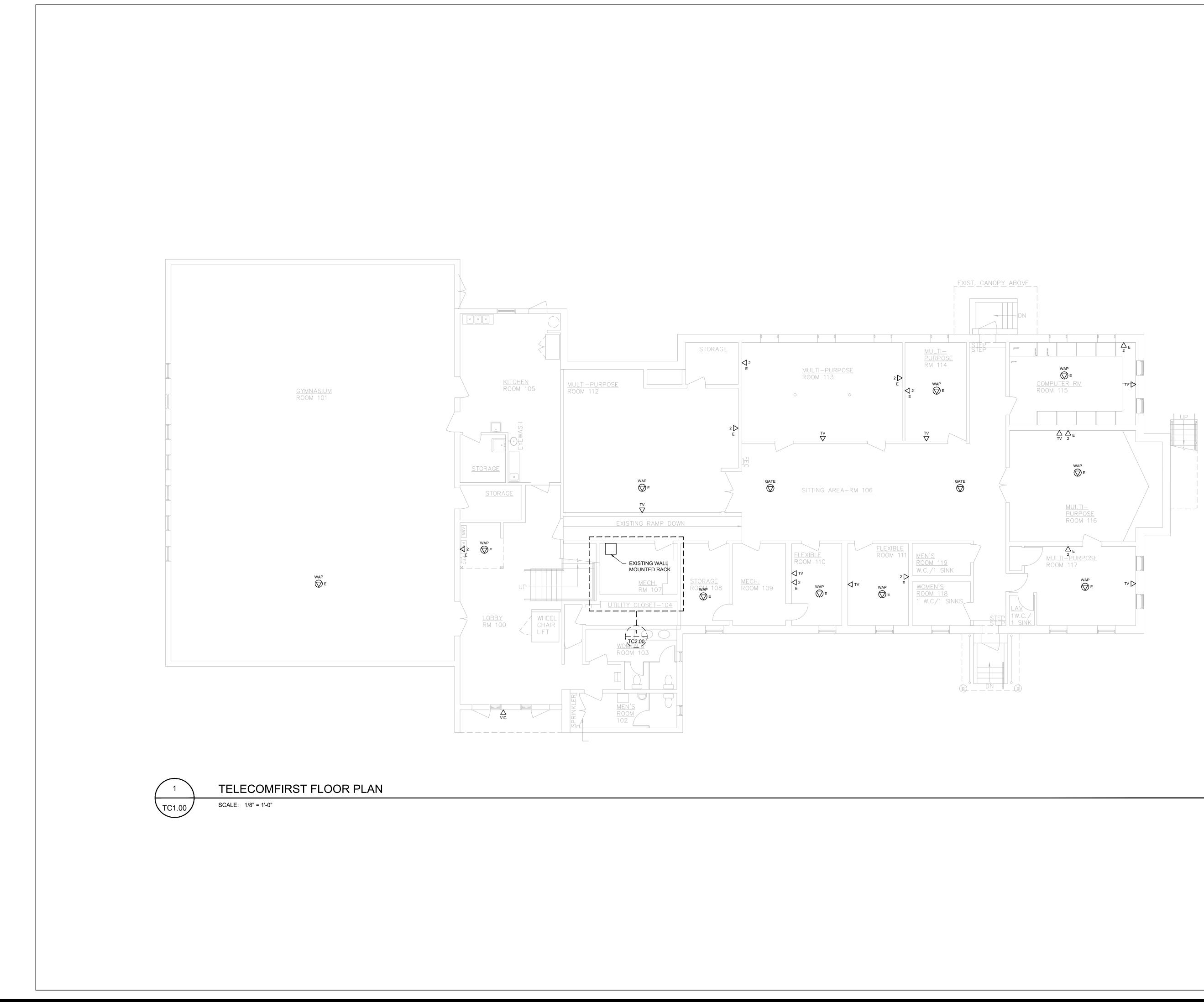
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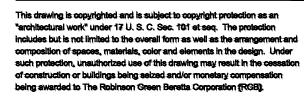
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FIRST FLOOR PLAN

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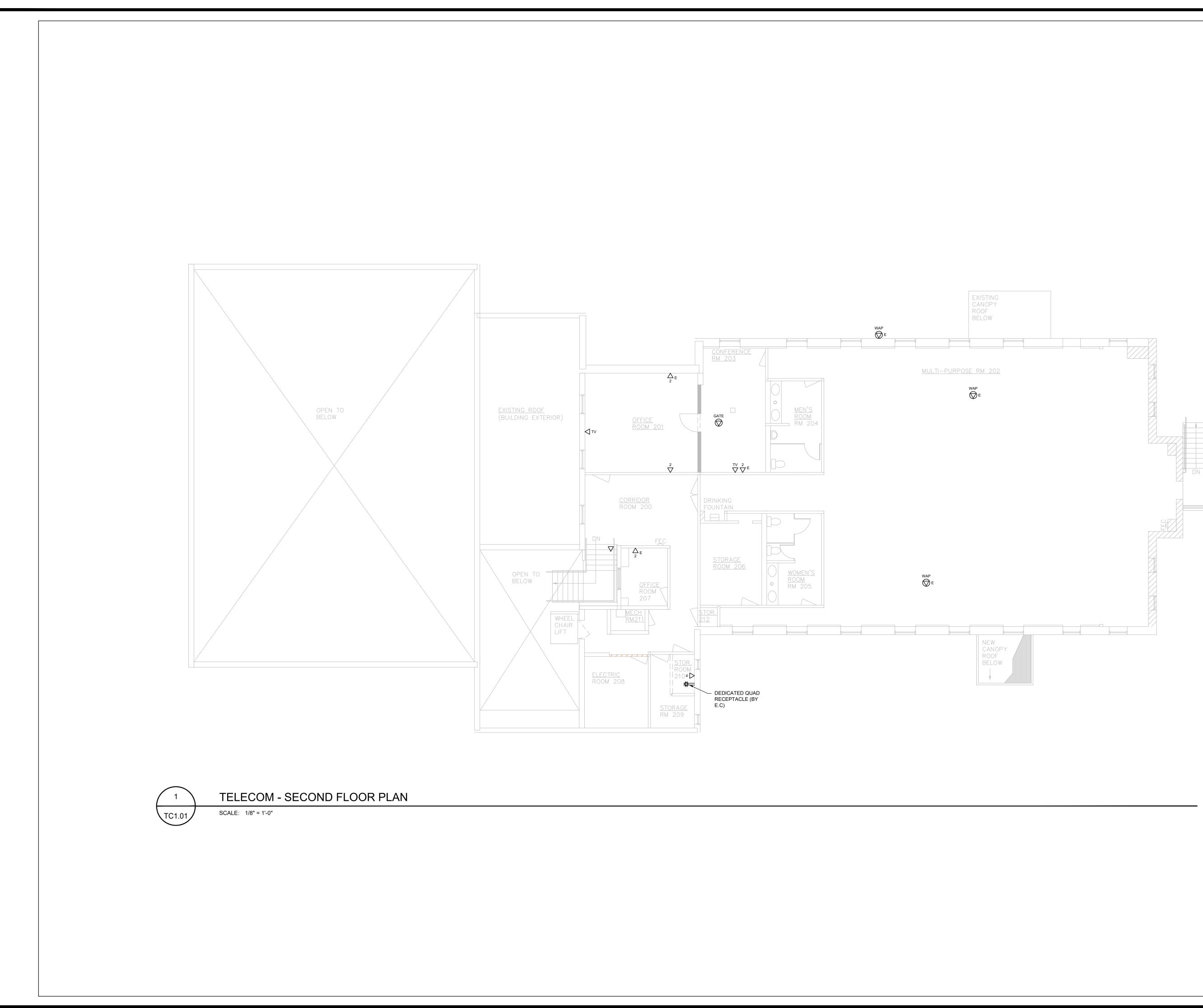
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BUILDING RENOVATIONS

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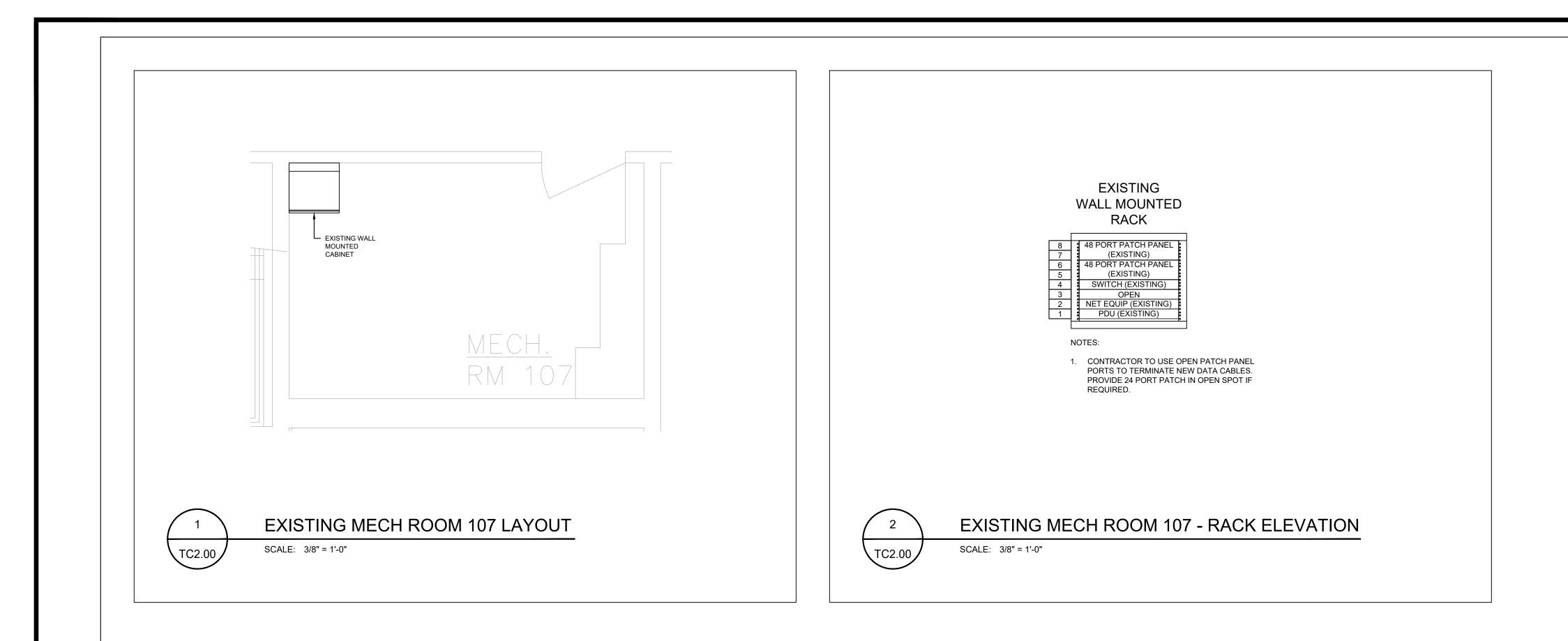
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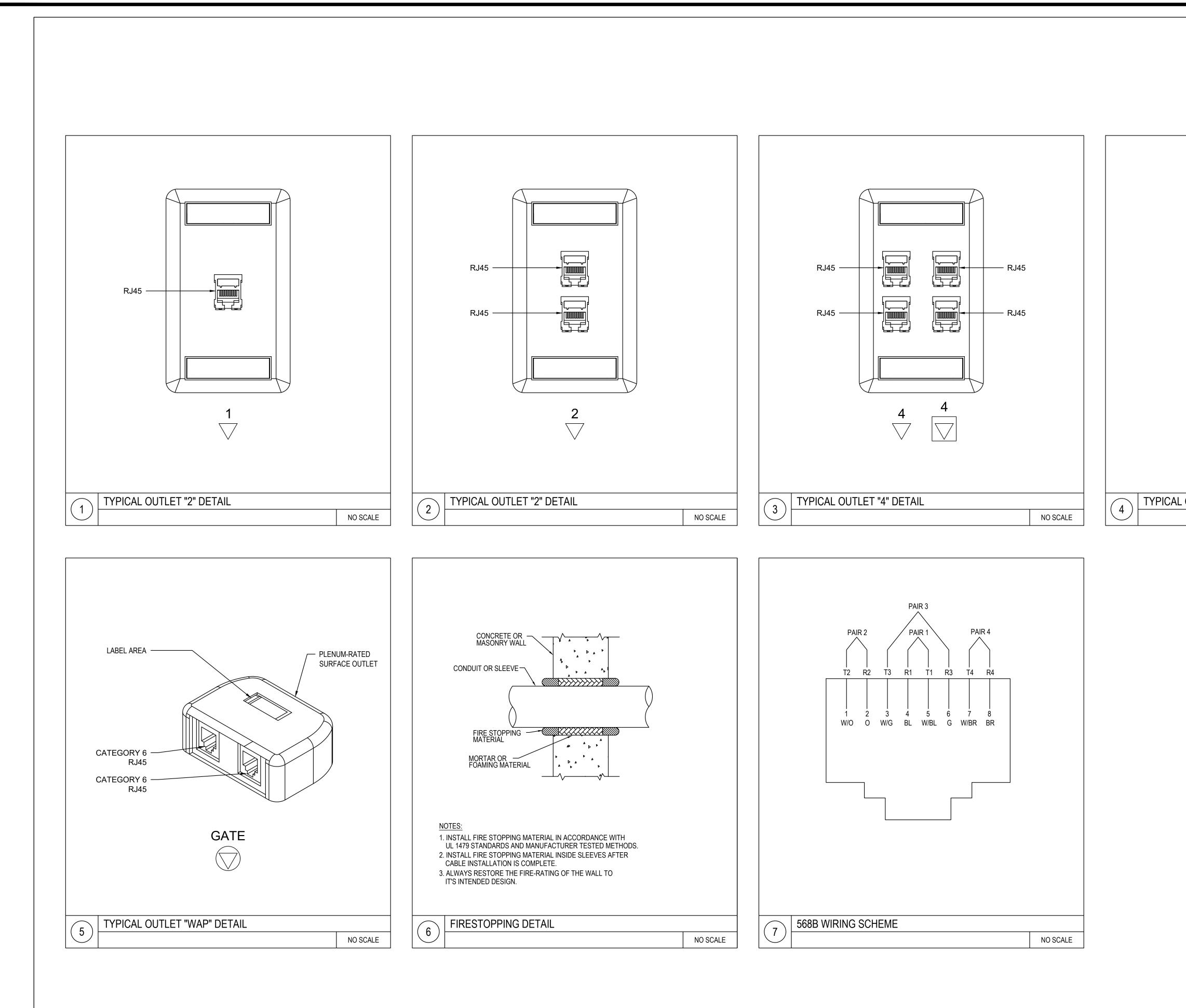
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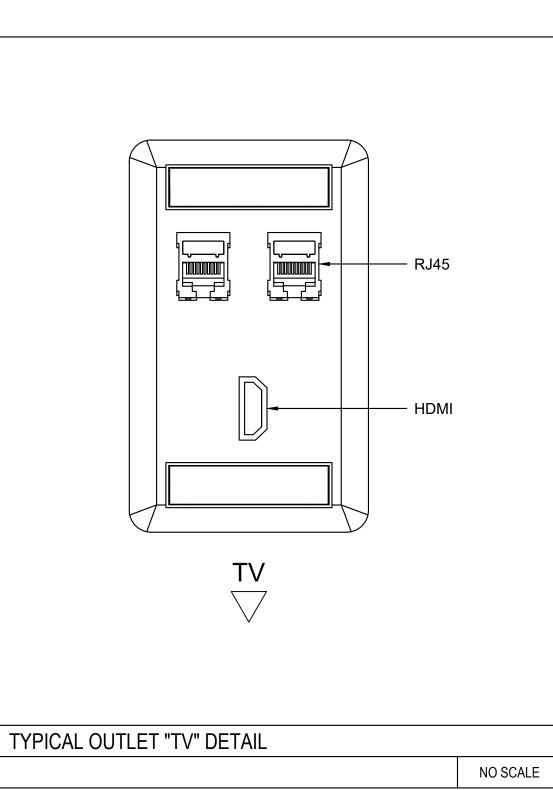
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## ABBREVIATIONS

ę	CENTERLINE
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
ATR	ALL THREADED ROD
AWG	AMERICAN WIRE GAUGE
BFBI	BUILDER FURNISHED - BUILDER INSTALLED
BMS	BUILDING MANAGEMENT SYSTEM
С	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CFD	CEMENT-FIBER DUCT
CL	CLOSET
CLG	CEILING
COAX	COAXIAL CABLE
СТ	CABLE TRAY
CTR	CENTER
DIA	DIAMETER
DWB	DISPLAY WALL BOX
DWG EC	DRAWING ELECTRICAL CONTRACTOR
ELEV	ELEVATOR ELECTROMAGNETIC INTERFERENCE
EMT	
EQPT FBO	EQUIPMENT FURNISHED BY OTHERS
FC	FINISHED CEILING
FCC	FIRE CONTROL CENTER
FR	
FRP	
GFGI	GOVERNMENT FURNISHED - GOVERNMENT INSTALLED
GC	GENERAL CONTRACTOR
GND	
HVAC	HEATING VENTILATION & AIR CONDITIONING
IDF	
IMC	INTERMEDIATE METAL CONDUIT - SEE NEC ARTICLE 342
JB	JUNCTION BOX
JB LAN	JUNCTION BOX LOCAL AREA NETWORK
JB LAN LEC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER
JB LAN LEC MDF	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME
JB LAN LEC MDF MM	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER)
JB LAN LEC MDF MM MTD	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED
JB LAN LEC MDF MM MTD MTG	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING
JB LAN LEC MDF MM MTD MTG NEC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70
JB LAN LEC MDF MM MTD MTG NEC NESC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE
JB LAN LEC MDF MM MTD MTG NEC NESC NIC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT
JB LAN LEC MDF MM MTD MTG NEC NESC NIC NTS	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED NOTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE
JB LAN LEC MDF MM MTD MTG NEC NESC NIC NTS OFCI	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED NOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED
JB LAN LEC MDF MM MTD MTG NEC NESC NIC NTS OFCI OSP	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT
JB LAN LEC MDF MM MTD MTG NEC NEC NESC NIC NTS OFCI OSP PNL	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL
JB LAN LEC MDF MM MTD MTG NEC NEC NESC NIC NIC NTS OFCI OSP PNL PR	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED NOUNTED NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE
JB LAN LEC MDF MM MTD MTG NEC NEC NESC NIC NTS OFCI OSP PNL PR PVC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE
JB LAN LEC MDF MM MTD MTG NTC NEC NESC NIC NTS OFCI OSP PNL PR PVC RM	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM
JB LAN LEC MDF MM MTD MTG NTC NEC NEC NIC NIC NTS OFCI OSP PNL PR PVC RM RMC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344
JB LAN LEC MDF MM MTD MTG NTC NEC NEC NEC NIC NIC NTS OFCI OSP PNL PR PNL PR PVC RM RMC RU	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH
JB LAN LEC MDF MM MTD MTG NTC NEC NEC NEC NEC NIC NTS OFCI OSP PNL PR PR PVC RM RMC RU RU SCC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH SECURITY CONTROL CENTER
JB LAN LEC MDF MM MTD MTG NTC NEC NEC NEC NEC NIC NTS OFCI OSP PNL PR PVC RM PVC RM RMC RU SCC SDF	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH SECURITY CONTROL CENTER SECURITY DISTRIBUTION FRAME
JB LAN LEC MDF MM MTD MTG MTG NEC NEC NEC NEC NEC NEC NEC NEC NEC NEC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH SECURITY CONTROL CENTER SECURITY DISTRIBUTION FRAME SINGLE-MODE (OPTICAL FIBER)
JB LAN LEC MDF MM MTD MTG NTC NEC NEC NEC NEC NIC NTS OFCI OSP PNL PR PNL PR PNL PR PVC RM RMC RU RU SCC SDF SM STP	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH SECURITY CONTROL CENTER SECURITY DISTRIBUTION FRAME SINGLE-MODE (OPTICAL FIBER) SHIELDED TWISTED PAIR
JB LAN LEC MDF MM MTD MTD MTG NTS NEC NEC NEC NEC NEC NEC NEC NEC NEC NEC	JUNCTION BOX LOCAL AREA NETWORK LOCAL EXCHANGE CARRIER MAIN DISTRIBUTION FRAME MULTI-MODE (OPTICAL FIBER) MOUNTED MOUNTING NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL CODE - NFPA 70 NATIONAL ELECTRICAL SAFETY CODE NOT IN CONTRACT NOT TO SCALE OWNER FURNISHED CONTRACTOR INSTALLED OUTSIDE PANT PANEL PAIRS-NUMBER OF PAIRS IN COPPER CABLE POLYVINYL CHLORIDE ROOM RIGID METAL CONDUIT - SEE NEC ARTICLE 344 RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH SECURITY CONTROL CENTER SECURITY DISTRIBUTION FRAME SINGLE-MODE (OPTICAL FIBER) SHIELDED TWISTED PAIR
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# AUDIO/VISUAL LEGEND AND ABBREVIATIONS

## SYMBOLS LEGEND

	RACEWAY LEGEND							
—— T ——	TELECOMMUNICATIONS CONDUIT							
UT	CONDUITS BELOW GRADE/SLAB OR EMBEDDED IN SLAB							
J	CABLES ON J-HOOKS							
o	CONDUIT UP							
•	CONDUIT DOWN							
<b> </b>	CONDUIT STUBBED OUT WITH BUSHING							
Ø	CONDUIT CROSS-SECTION							
CT	TELECOMMUNICATIONS CABLE TRAY							
	TELECOMMUNICATIONS CABLE TRAY							

## MISCELLANEOUS SYMBOL LEGEND

<b>#</b>	SHEET KEYNOTE
#	REVISION NUMBER
1 T2.1	CALLOUT NUMBER

	AUDIO/VISUAL DEVICE LEGEND	LEGEND NOTES					
нCP	CONTROL PANEL EXTRON MLC 62 RS D	BE USED AS A	THIS SHEET IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS AND SHALL BE USED AS A DICTIONARY TO DEFINE ITEMS INDICATED ON DRAWINGS. NOT ALL SYMBOLS OR ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT.				
нТР	TOUCH PANEL CRESTRON TSW-1070-B-S WITH BACK BOX		DRAWING LIST				
нAV)	CRESTRON DM-TX-200-C-2G-B-T	AV0.01	AUDIO/VISUAL - LEGEND AND NOTES SHEET				
		AV1.00	AUDIO/VISUAL - FIRST FLOOR PLAN				
		AV1.01	AUDIO/VISUAL - SECOND FLOOR PLAN				
нBT)	QSC AXIOM BT1	AV2.00	AUDIO/VISUAL - DETAILS SHEET				
		AV2.01	AUDIO/VISUAL - DETAILS SHEET				
		AV2.02	AUDIO/VISUAL - DETAILS SHEET				
		AV2.03	AUDIO/VISUAL - DETAILS SHEET				
+BT RX	QSC AXIOM AXP10	AV2.04	AUDIO/VISUAL - DETAILS SHEET				
RX		AV2.05	AUDIO/VISUAL - DETAILS SHEET				
		AV2.06	AUDIO/VISUAL - DETAILS SHEET				
		AV2.07	AUDIO/VISUAL - DETAILS SHEET				
ANT	SHURE UA-824 ANTENNA WITH WALL MOUNTED BRACKET	AV2.08	AUDIO/VISUAL - DETAILS SHEET				
		AV3.00	AUDIO/VISUAL - DETAILS SHEET				
		AV3.01	AUDIO/VISUAL - DETAILS SHEET				
SB	SOUND BAR	AV3.02	AUDIO/VISUAL - DETAILS SHEET				
	JABRA PANACAST 50	AV3.03	AUDIO/VISUAL - DETAILS SHEET				
		AV3.04	AUDIO/VISUAL - DETAILS SHEET				
(DM)	CRESTRON DM-RMC-4KZ-100-C	AV4.00	AUDIO/VISUAL - DETAILS SHEET				
		AV4.01	AUDIO/VISUAL - DETAILS SHEET				
	CRESTRON SAROS IC6T-W-T CEILING SPEAKER						
AM	CRESTRON AIRMEDIA AM-3100-WF						
000 000	CHIEF PAC-526 BOX SEE WALL ELEVATIONS FOR CONDUIT REQUIREMENTS PROVIDE PULL STRINGS IN EACH CONDUIT						

## GENERAL NOTES

- THE DRAWINGS AND SPECIFICATIONS INDICATE THE INTENT OF THE DESIGN AND SHALL BE CONSIDERED AS DIAGRAMMATIC ONLY. EXACT LOCATIONS FOR AUDIO/VISUAL DEVICES AND EQUIPMENT SHALL BE DETERMINED AT THE SITE. AS WORK PROGRESSES, DIMENSIONS AND CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE.
- USE ONLY PRODUCTS LISTED FOR THEIR INTENDED USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL), EXCEPT THOSE TYPES OF PRODUCTS FOR WHICH NO RELEVANT STANDARDS EXIST.
- WHERE ELECTRICAL POWER OUTLETS, CONNECTION POINTS AND LIGHTING ARE SHOWN ON THE AUDIO/VISUAL DRAWINGS, THEY ARE INCLUDED ONLY FOR LOCATION COORDINATION PURPOSES. REFER TO THE ELECTRICAL POWER & LIGHTING DRAWINGS FOR THEIR ACTUAL INSTALLATION AND CONSTRUCTION.
- CONDUITS AND EQUIPMENT OF ALL TRADES SHALL BE PROPERLY COORDINATED AND SET TO MAINTAIN THE CLEARANCES REQUIRED BY APPLICABLE FEDERAL, STATE AND LOCAL CODES.
- MOUNTING HEIGHTS SHALL BE AS INDICATED ON ARCHITECTURAL DRAWINGS.

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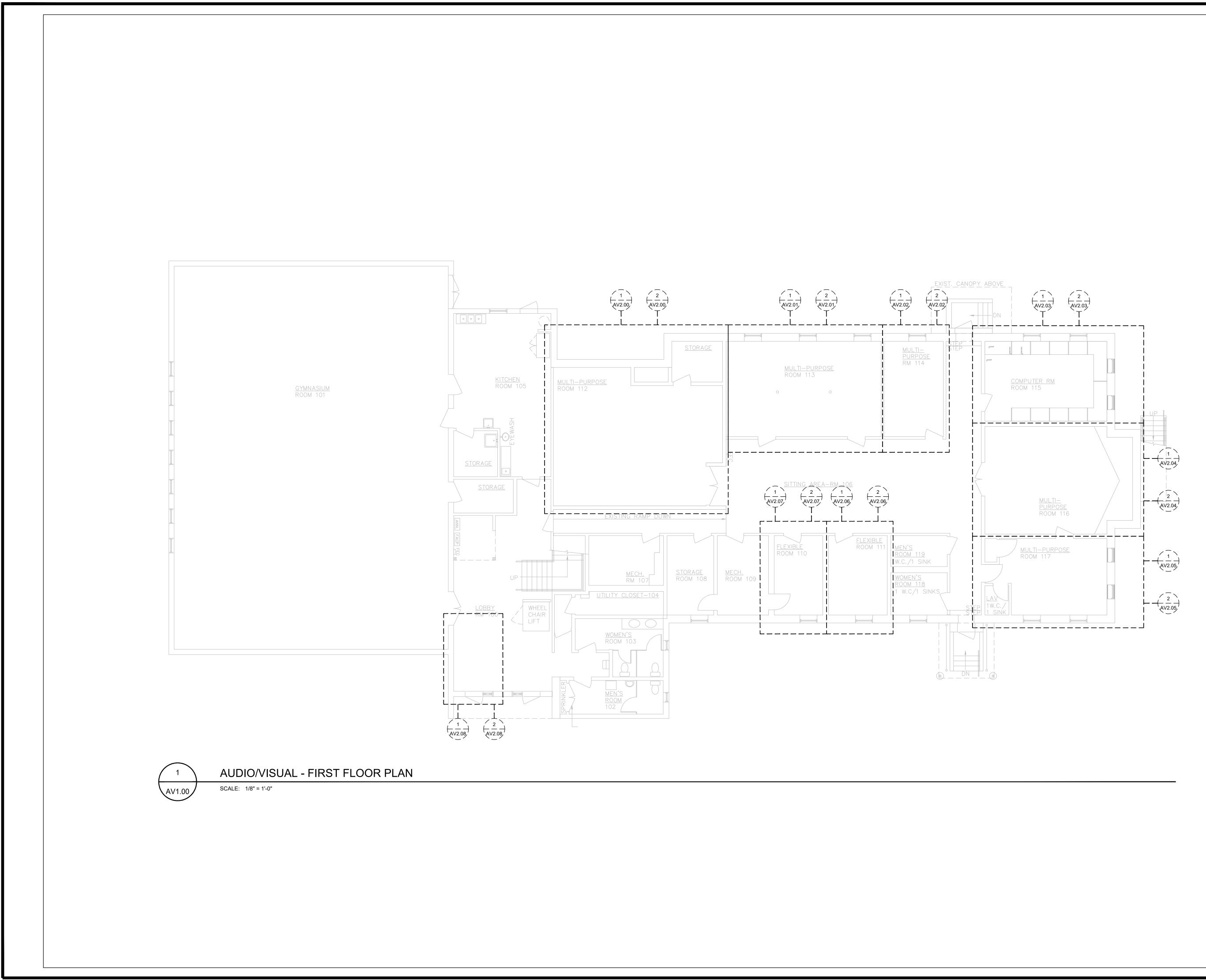
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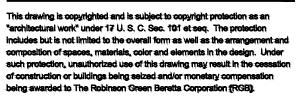
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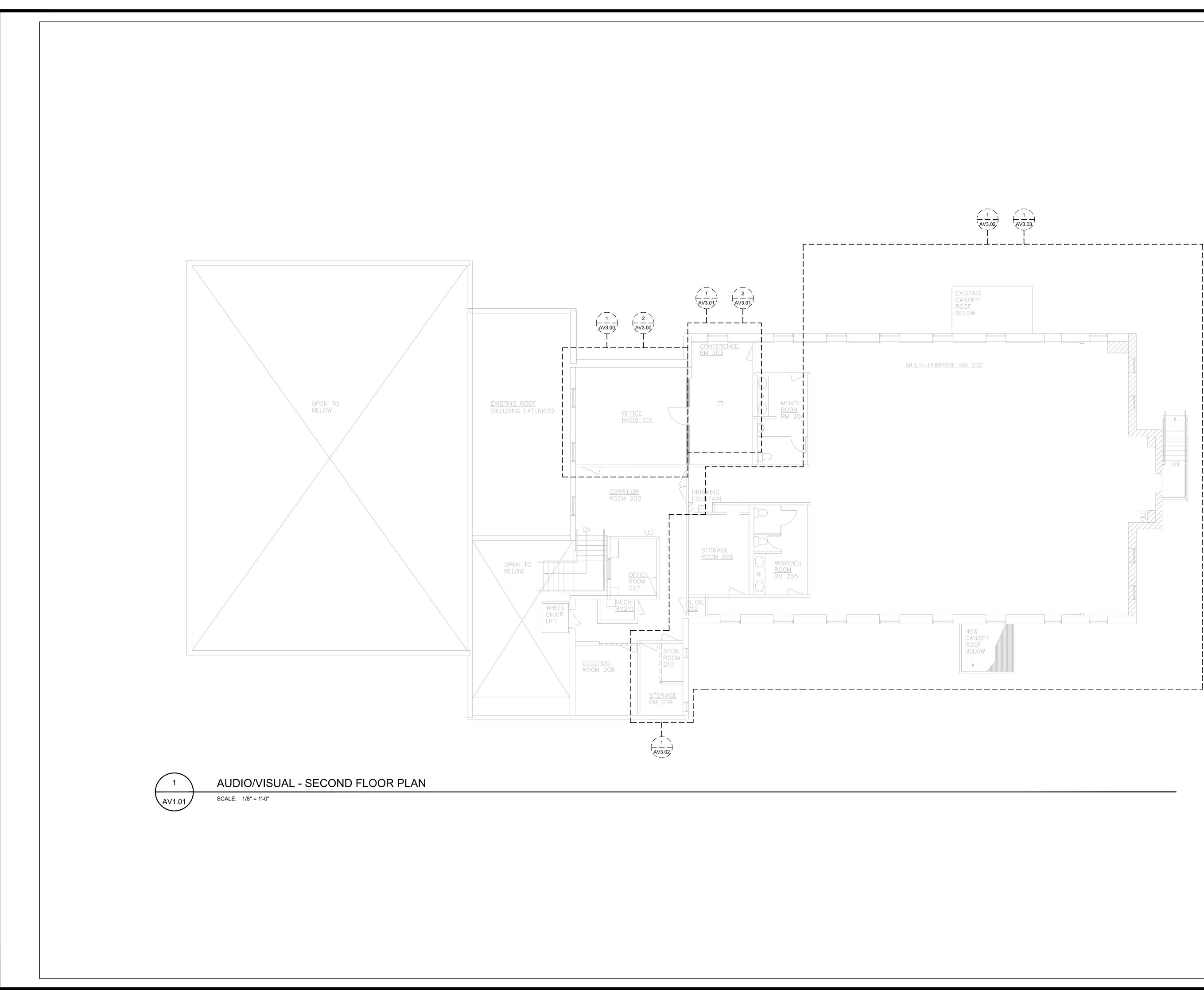
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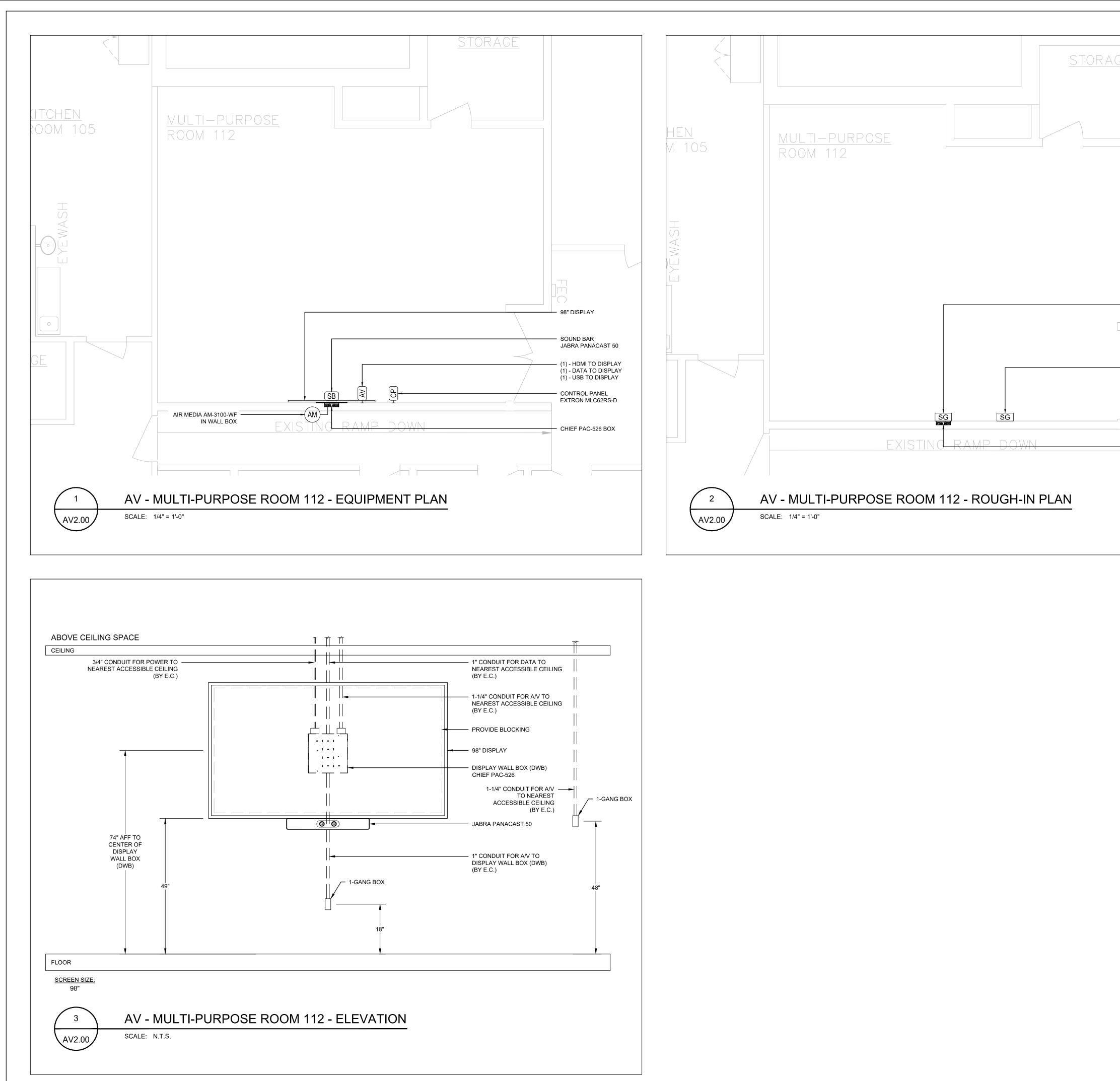
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Sheet Contents AUDIO VISUAL SECOND FLOOR PLAN

Project Number. 6844 PROVIDENCE COMMUNITY CENTER

Drawing No.





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	1-GANG BOX MOUNTED AT 18" AFF WITH (1) - 1-1/4" CONDUIT FOR A/V TO NEAREST ACCESSIBLE CEILING
	<ul> <li>1-GANG BOX MOUNTED AT 48" AFF WITH (1) - 1-1/4" CONDUIT FOR A/V TO NEAREST ACCESSIBLE CEILING</li> <li>SEE ELEVATION DETAIL FOR</li> </ul>
	CONDUITS SIZES AND QTY'S.

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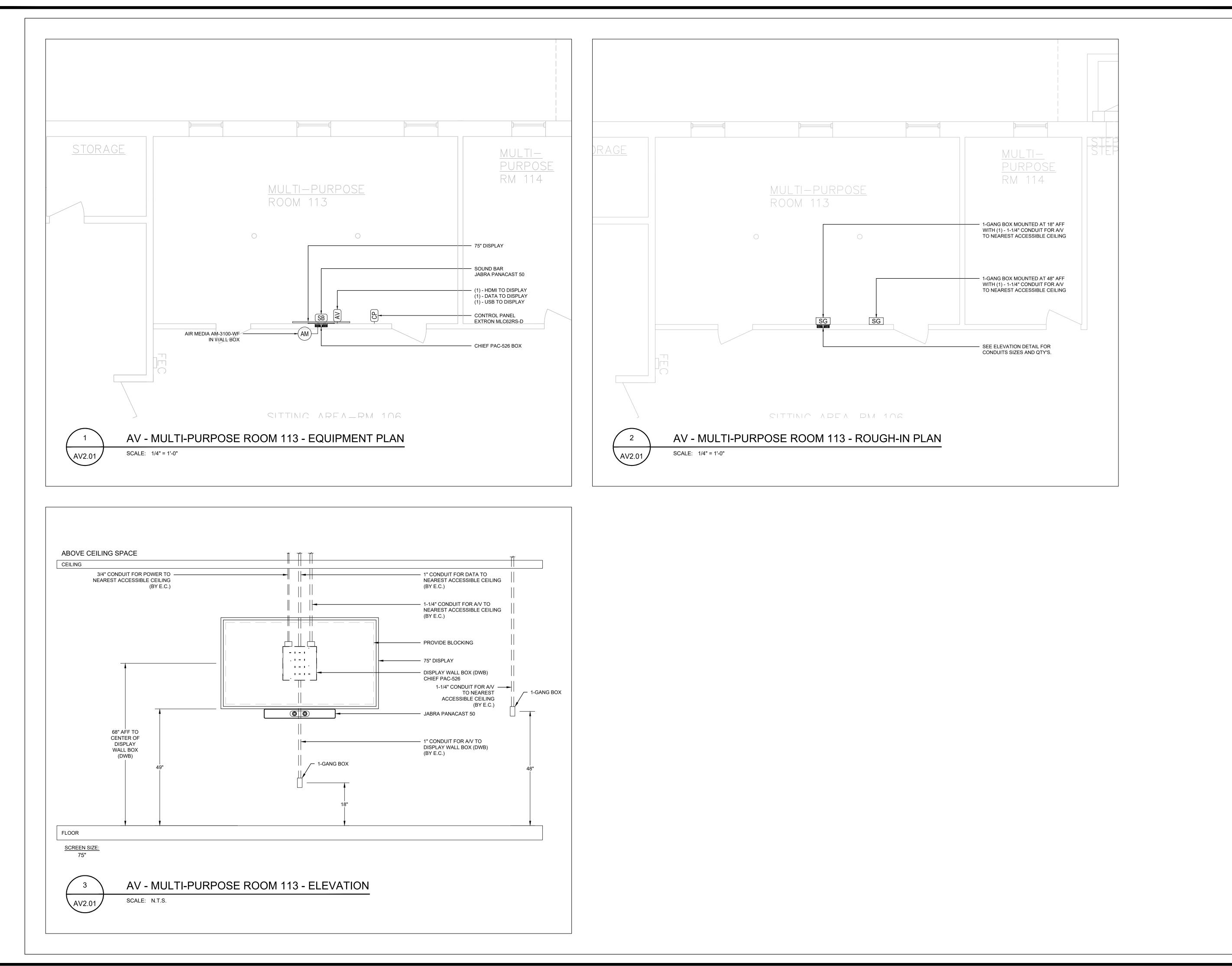
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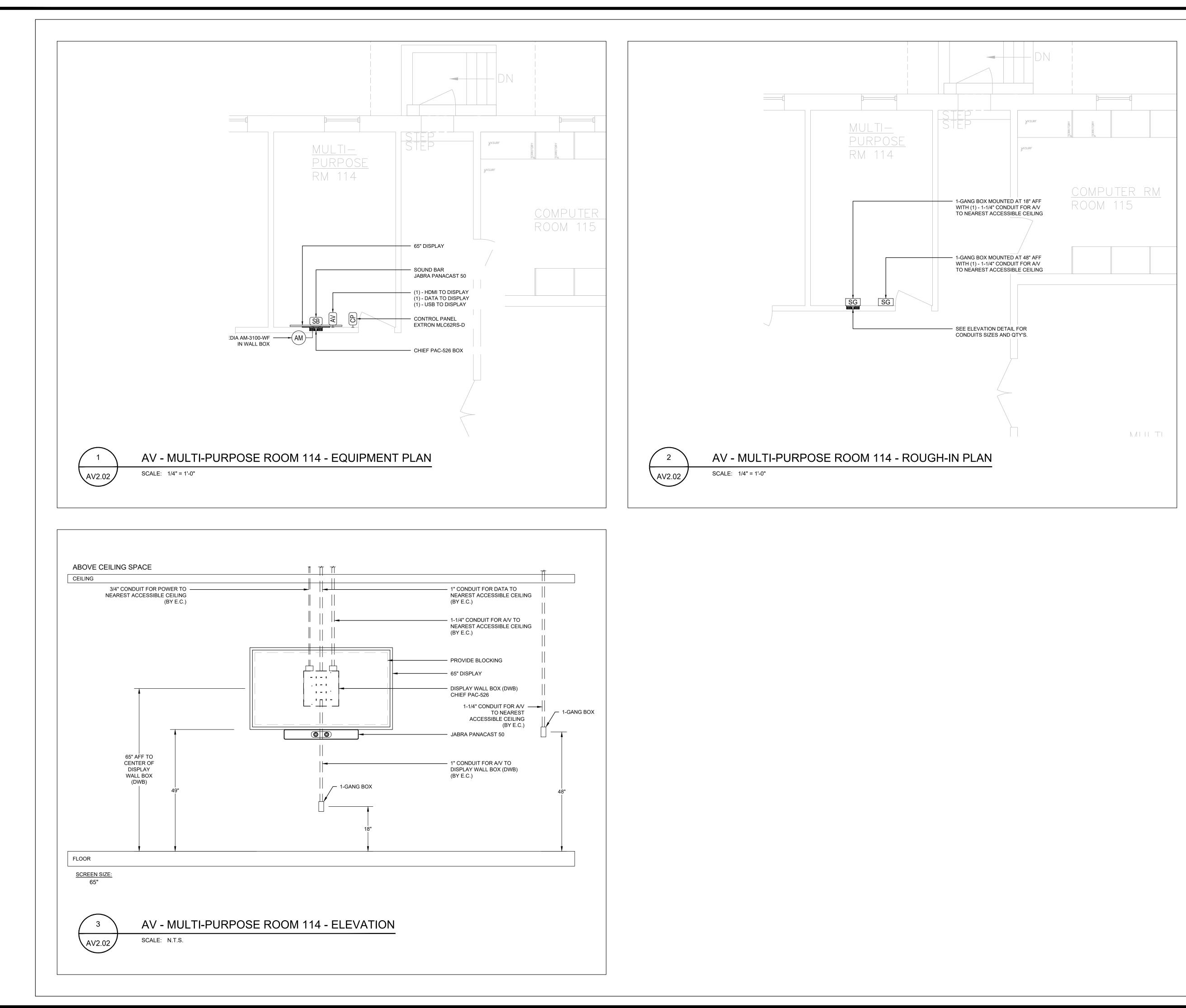
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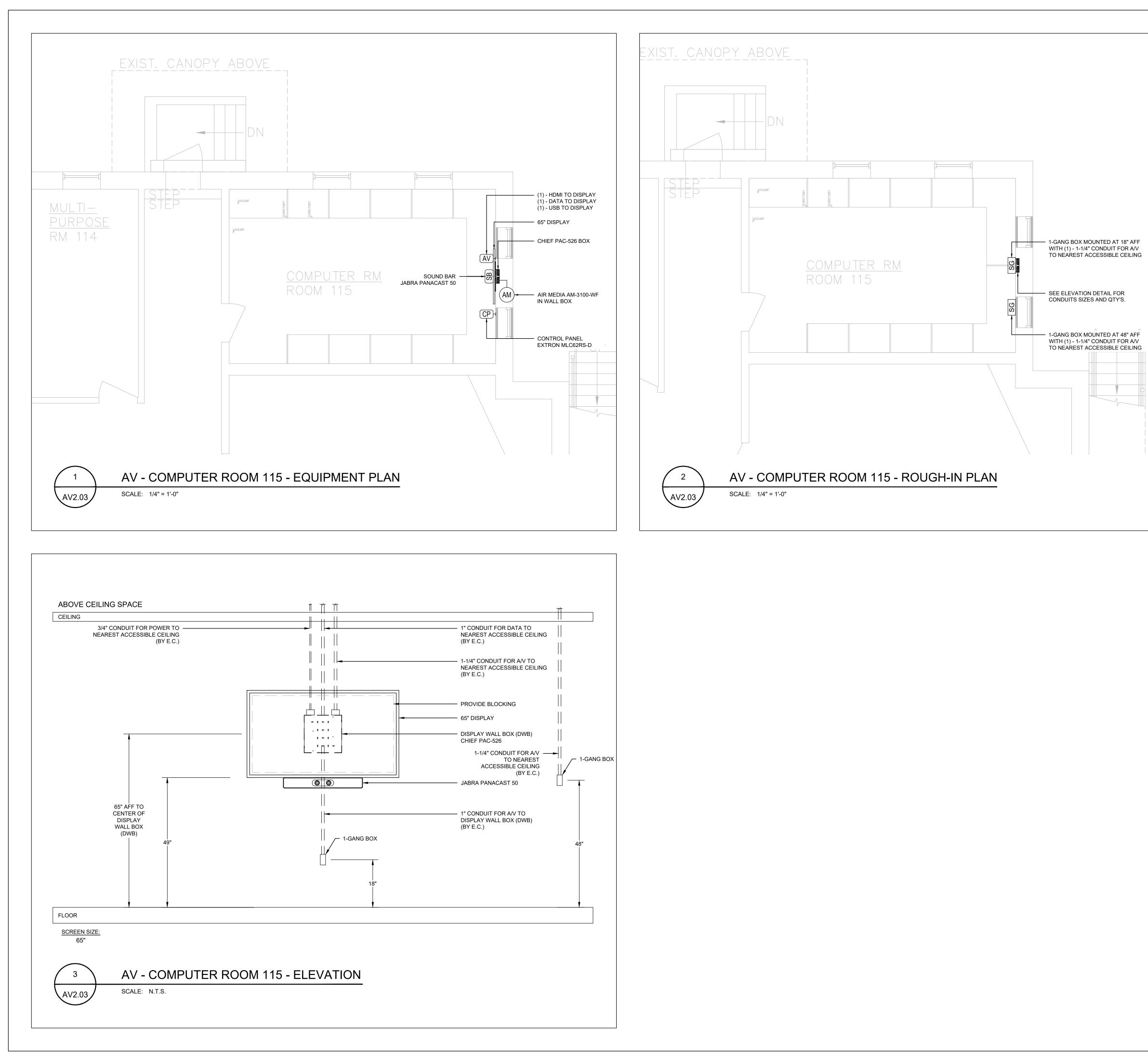
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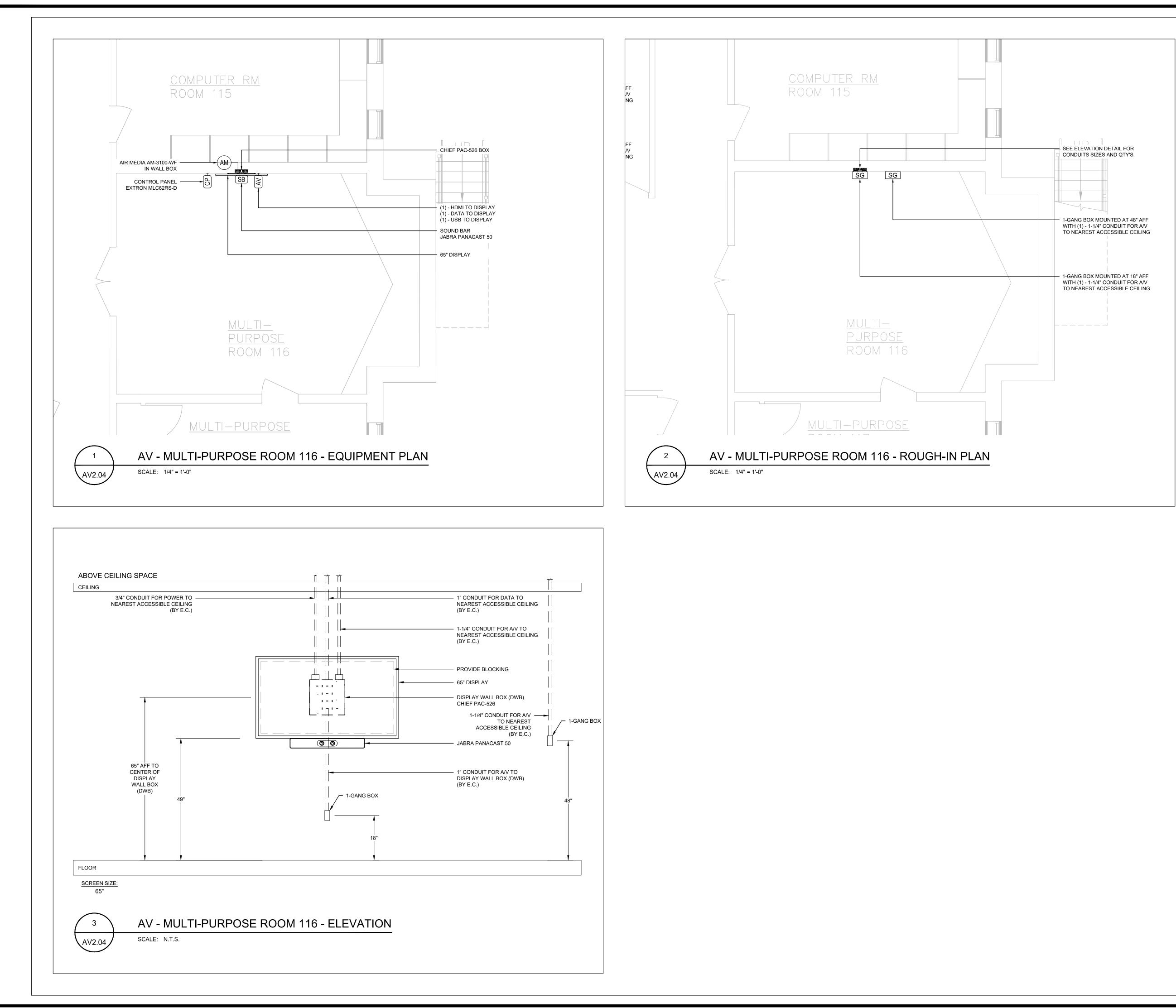
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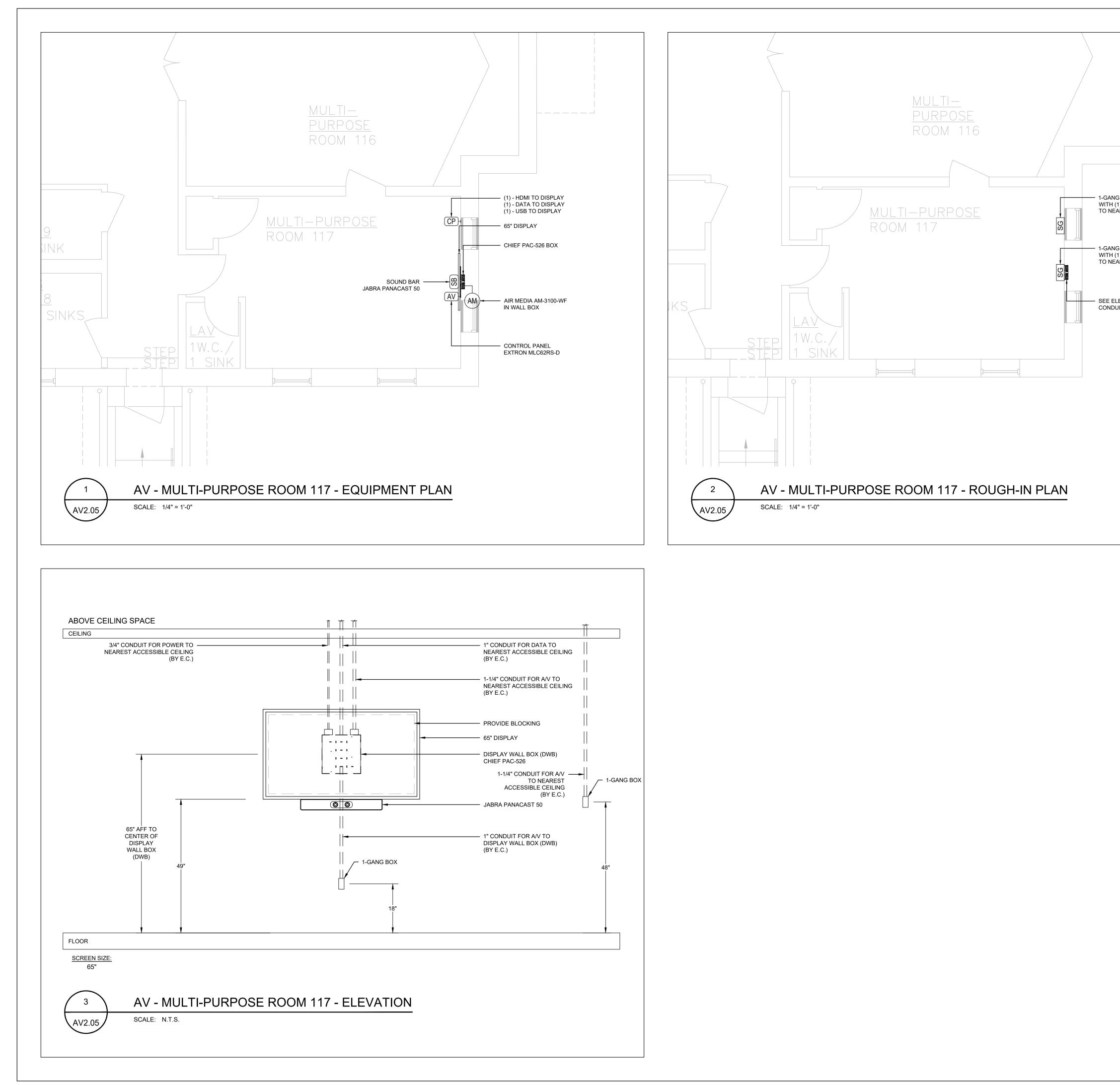
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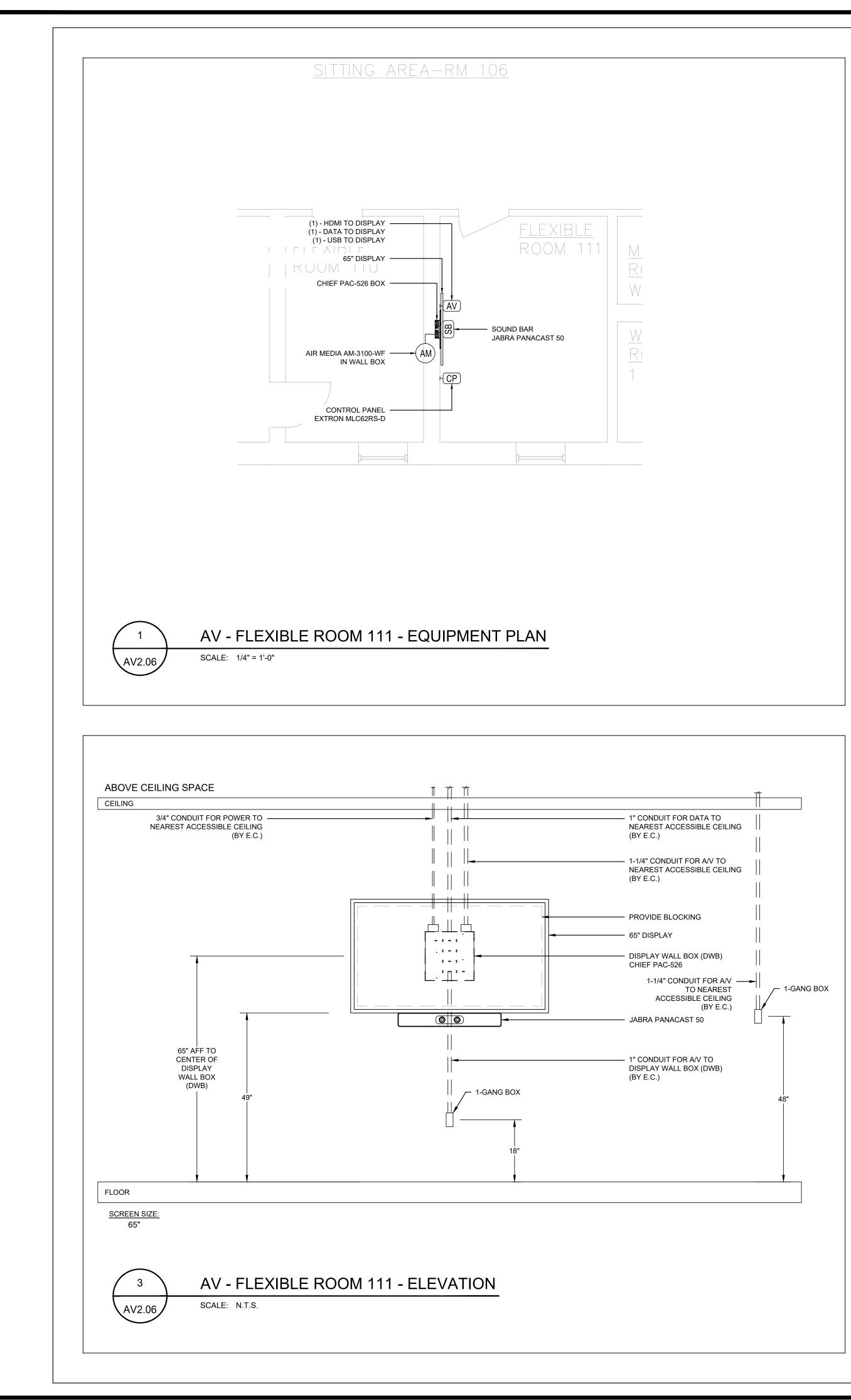
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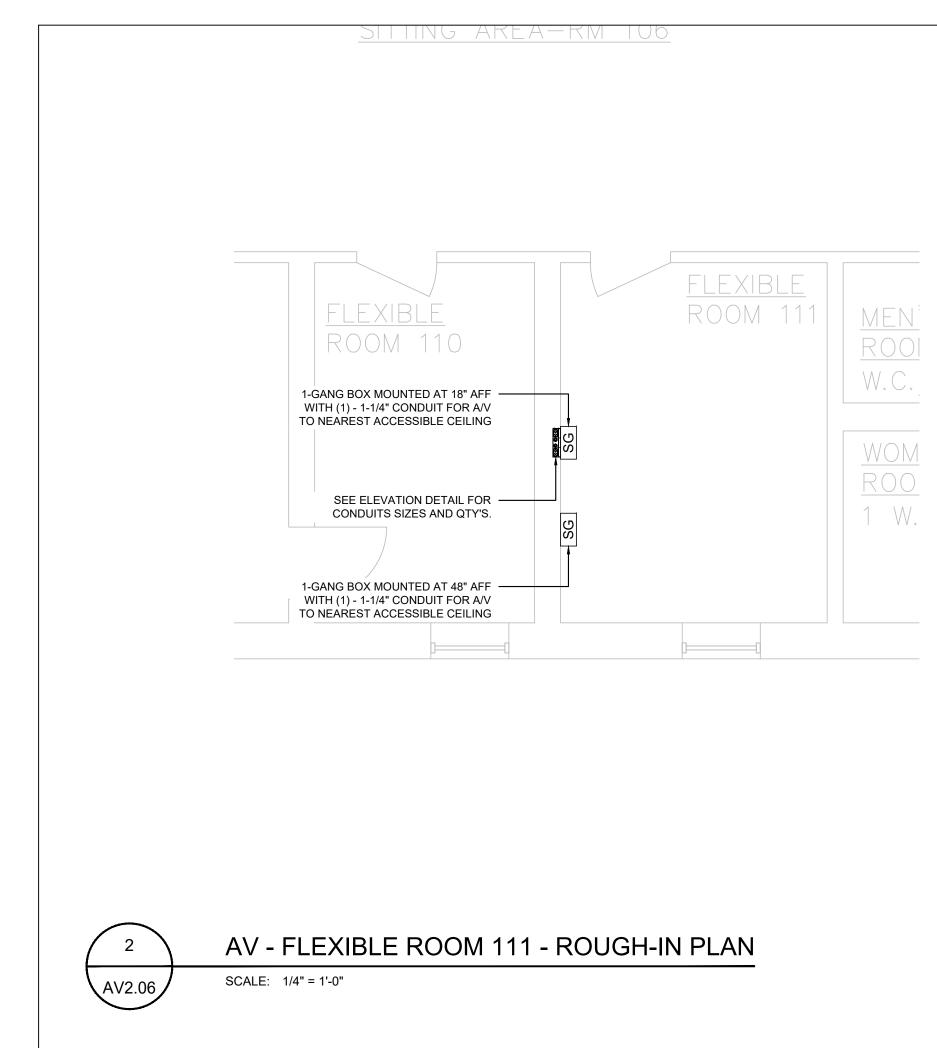
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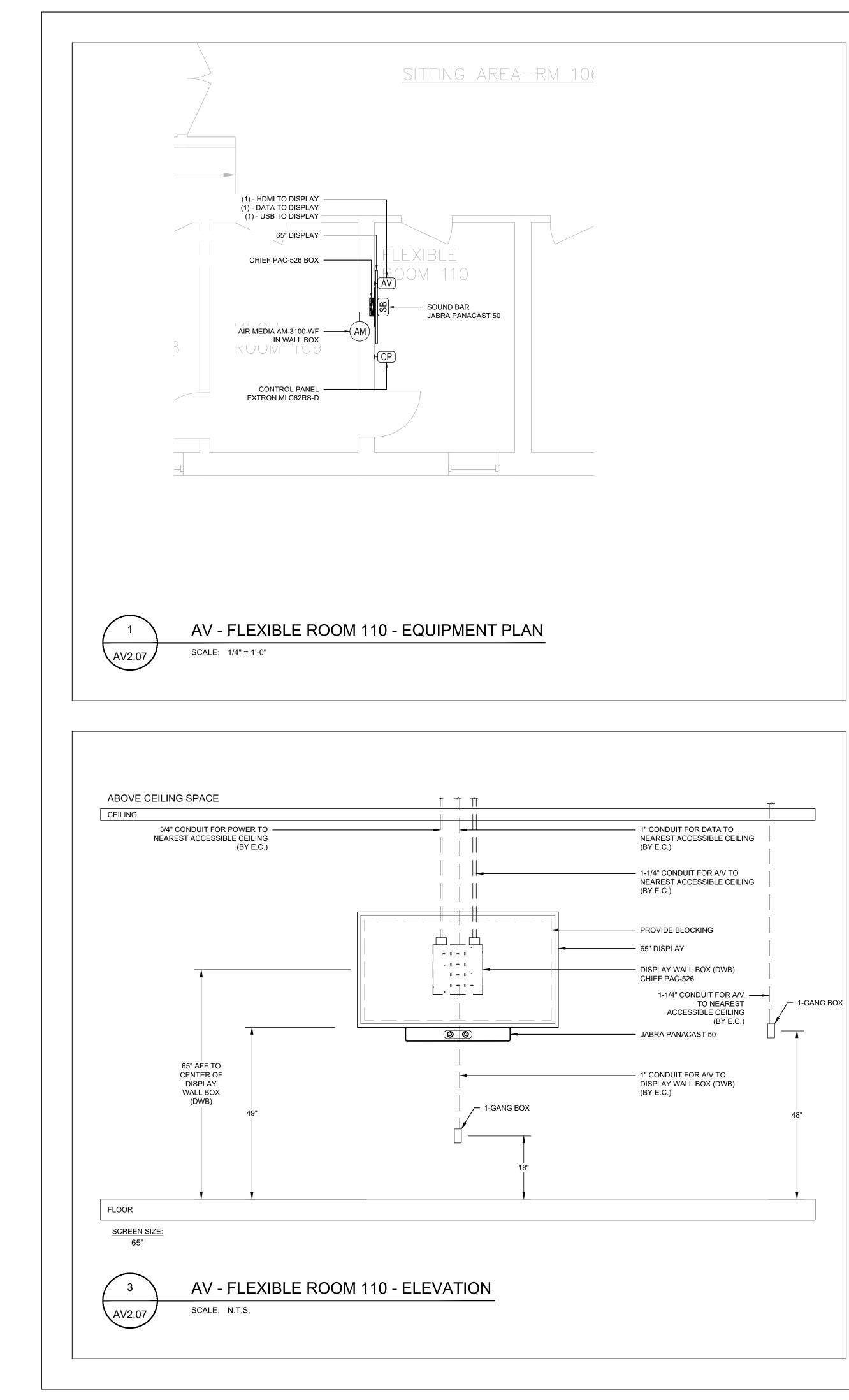
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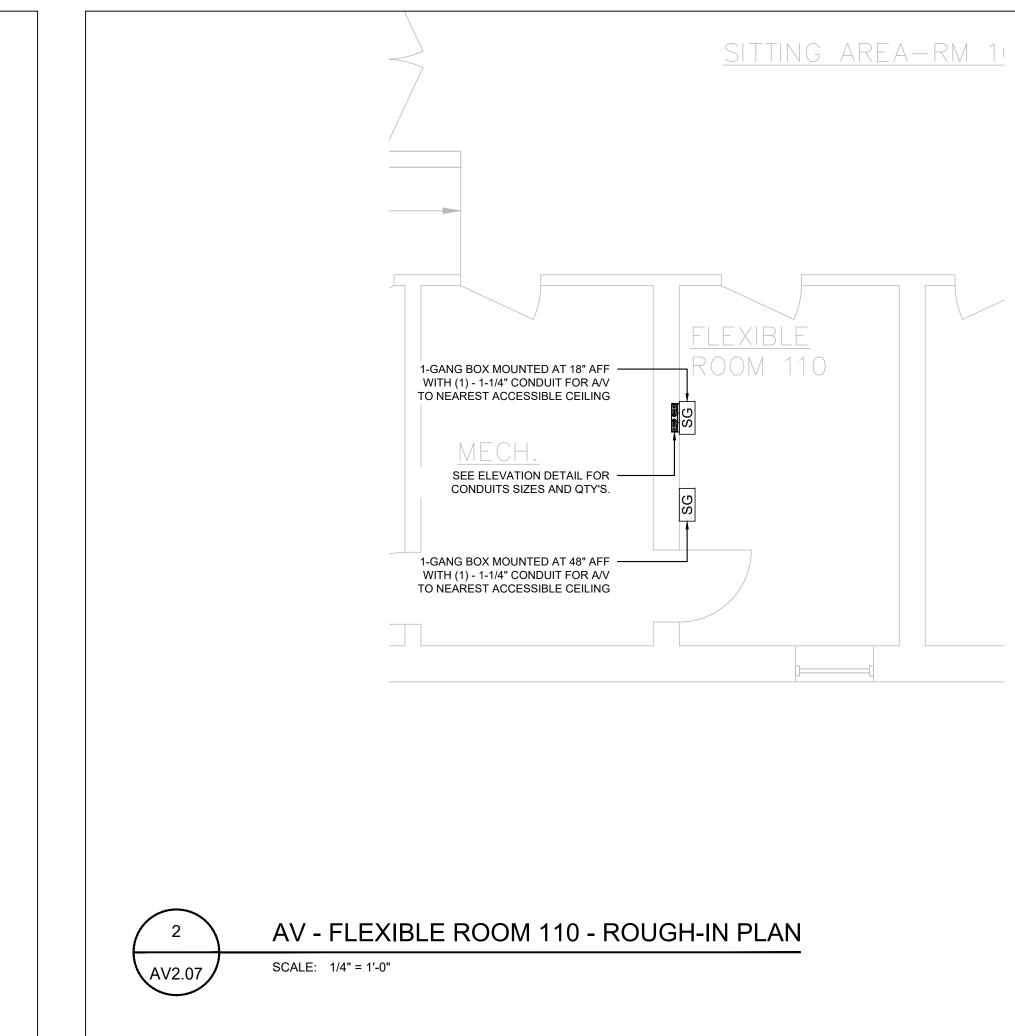
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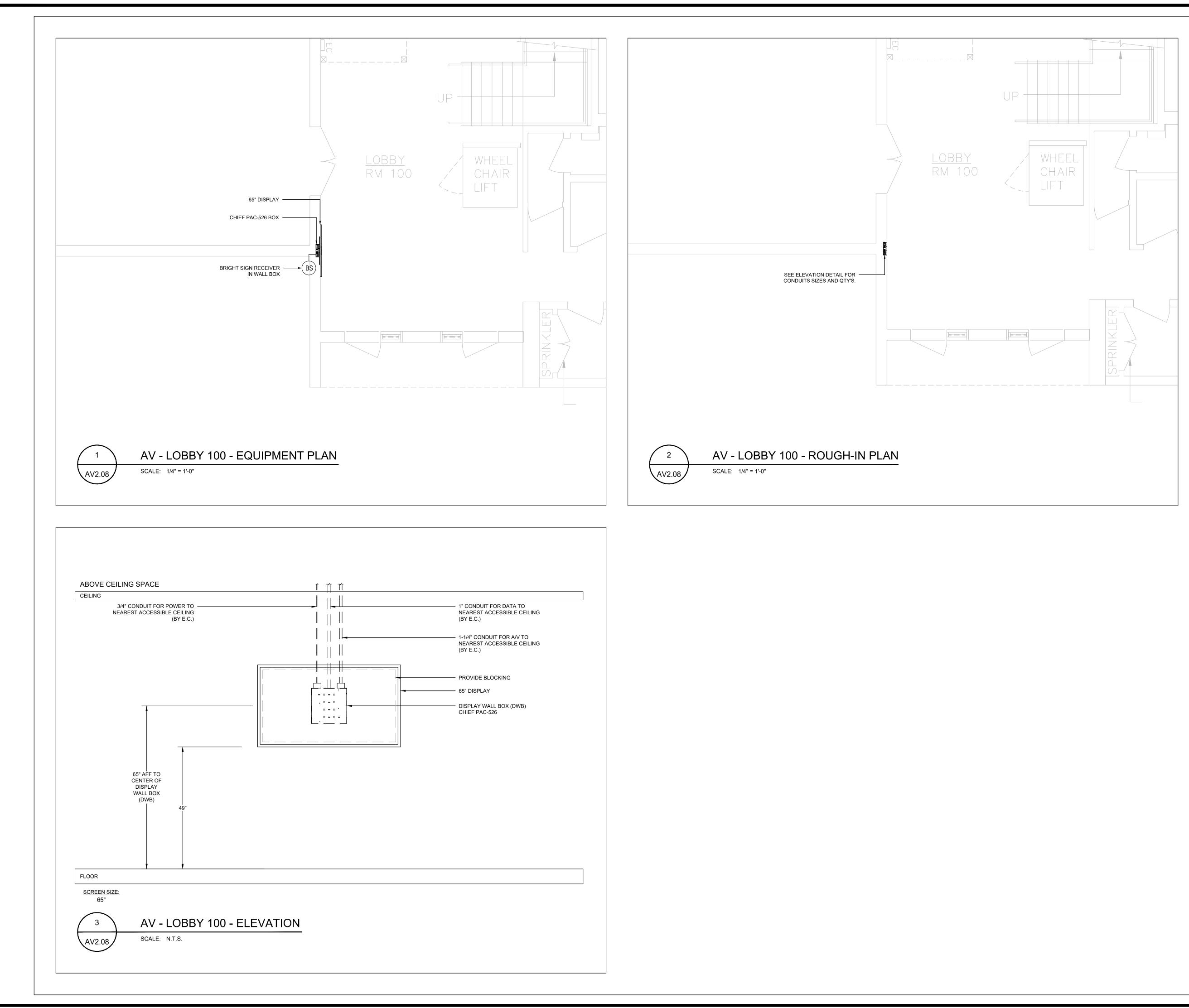
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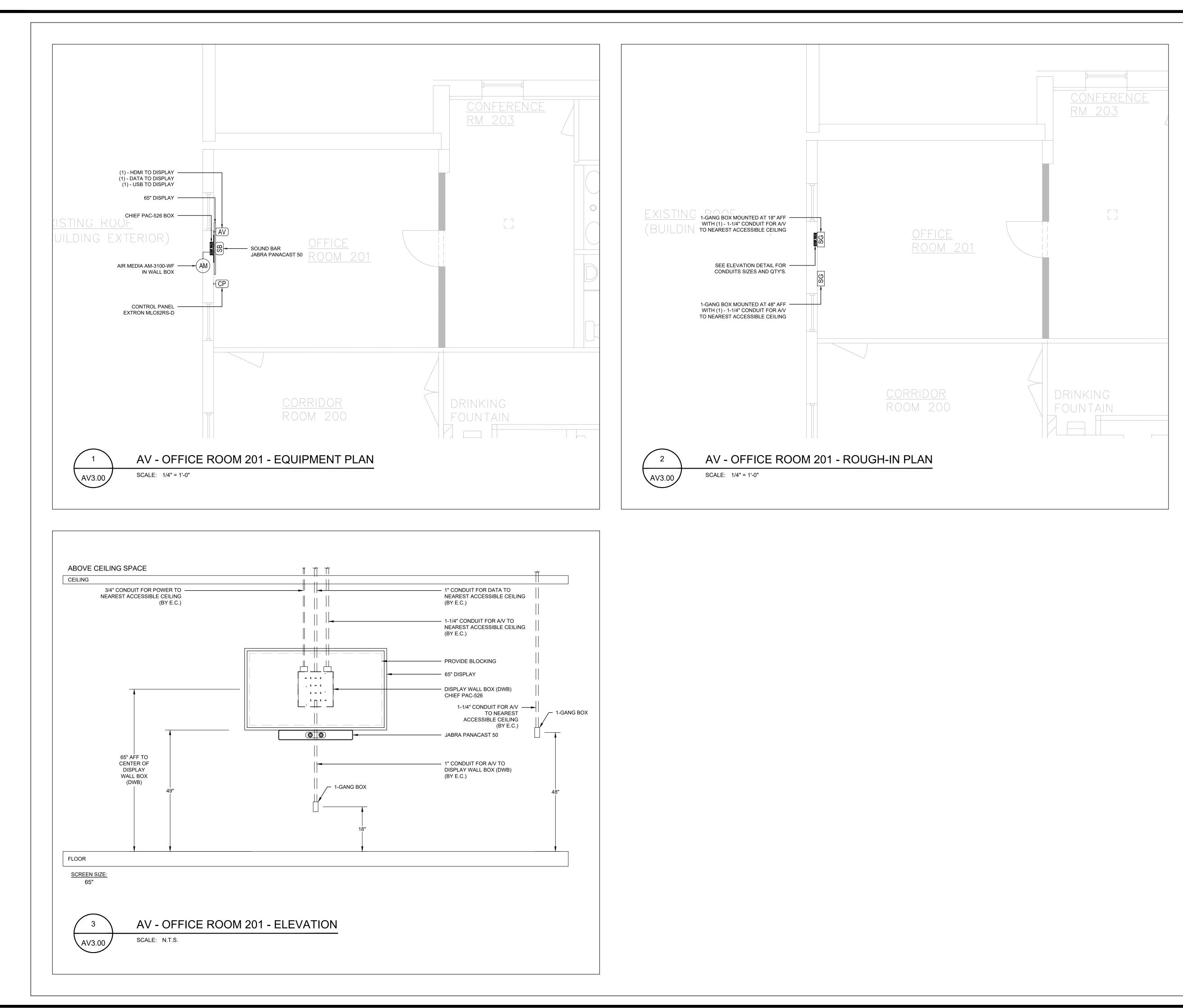
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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

155 NIAGARA STREET PROVIDENCE, RI 02907

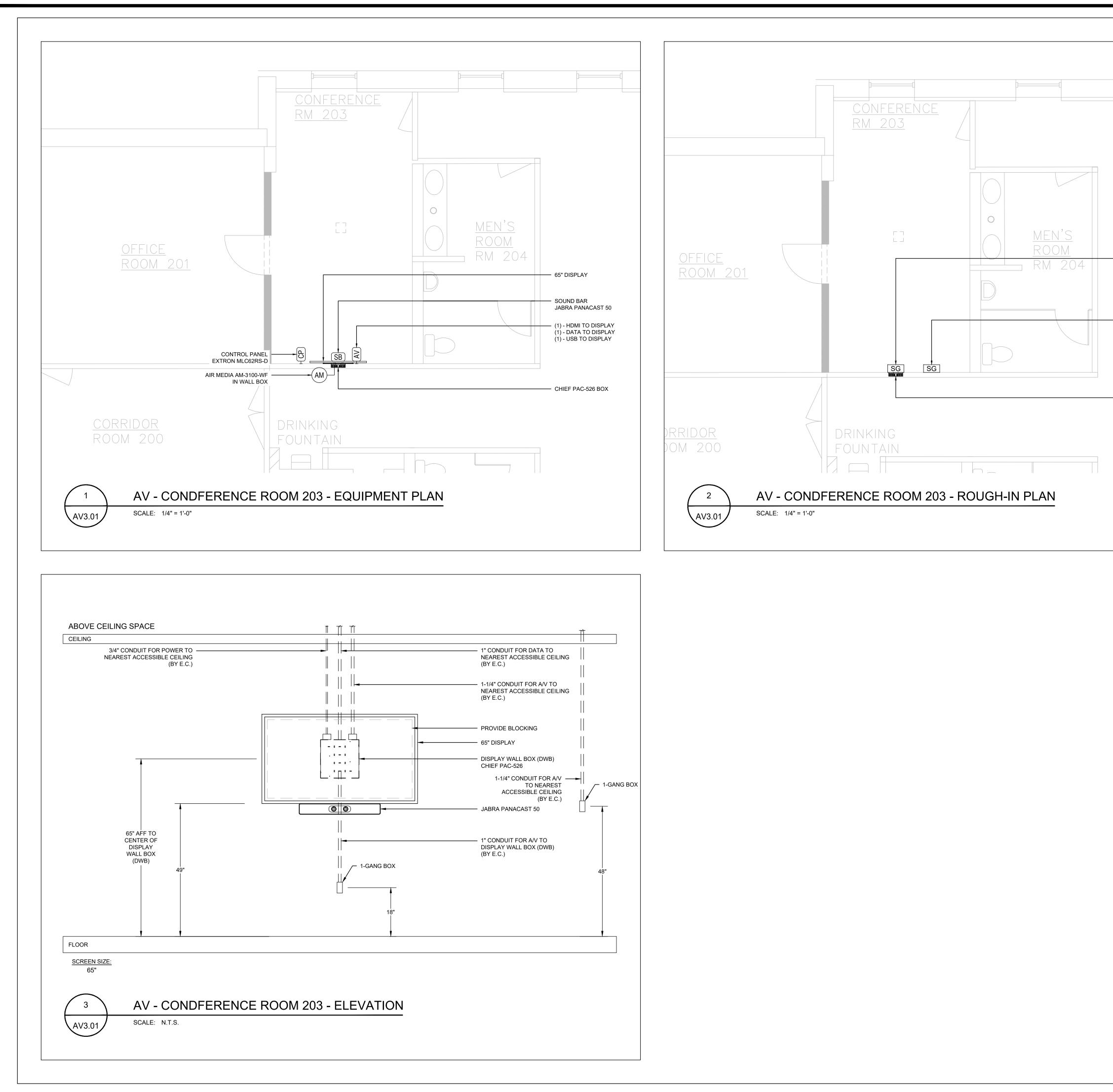
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Sheet Contents AUDIO VISUAL DETAILS SHEET

Drawing No.





1-GANG BOX MOUNTED AT 18" AFF	
WITH (1) - 1-1/4" CONDUIT FOR A/V TO NEAREST ACCESSIBLE CEILING	
1-GANG BOX MOUNTED AT 48" AFF WITH (1) - 1-1/4" CONDUIT FOR A/V TO NEAREST ACCESSIBLE CEILING	
SEE ELEVATION DETAIL FOR CONDUITS SIZES AND QTY'S.	

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BUILDING RENOVATIONS

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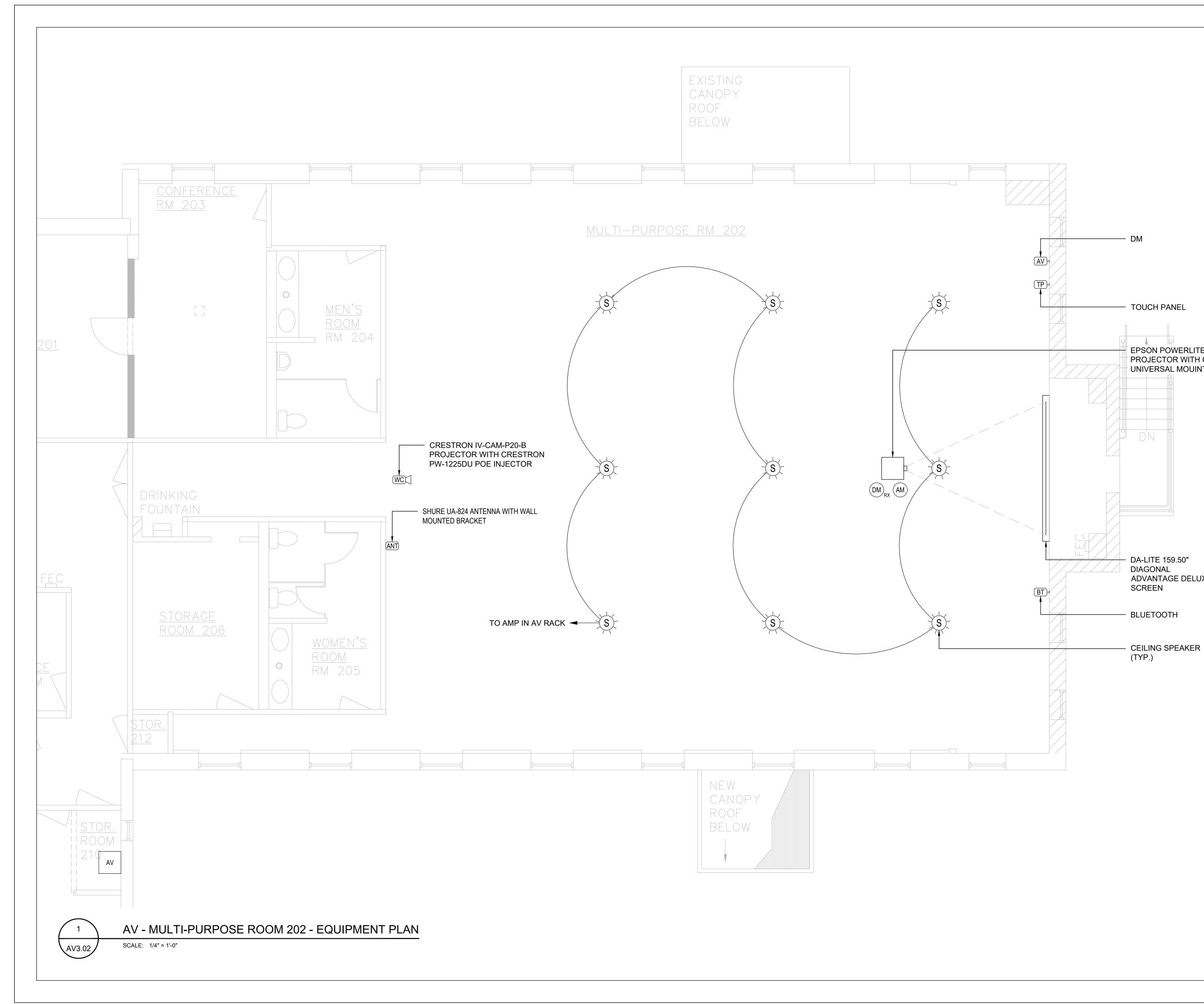
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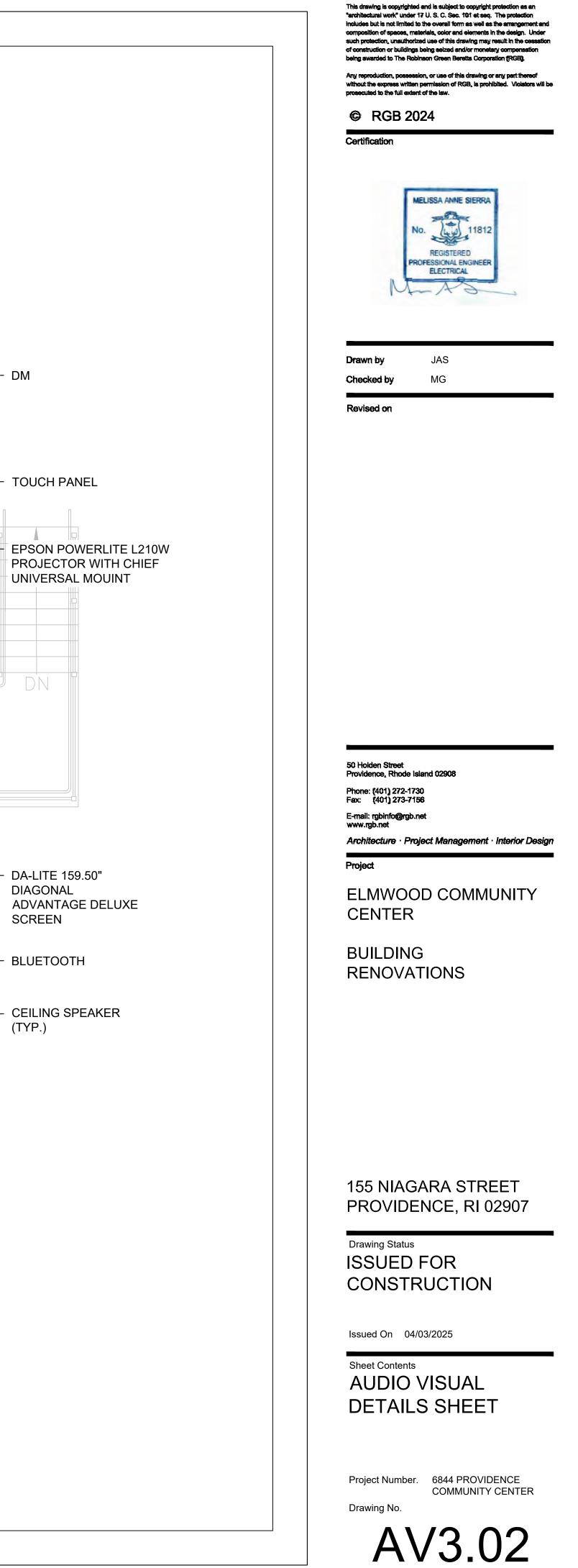
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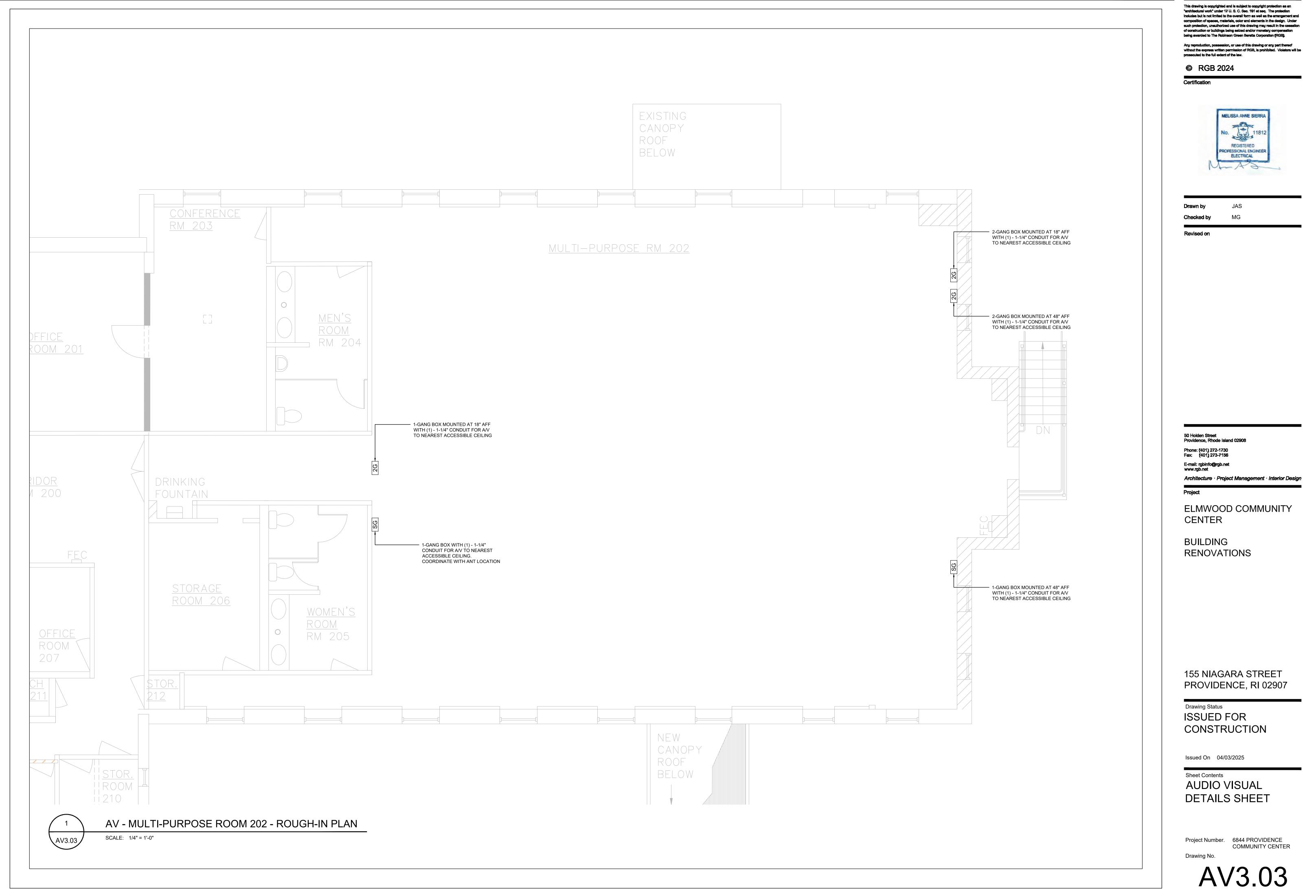
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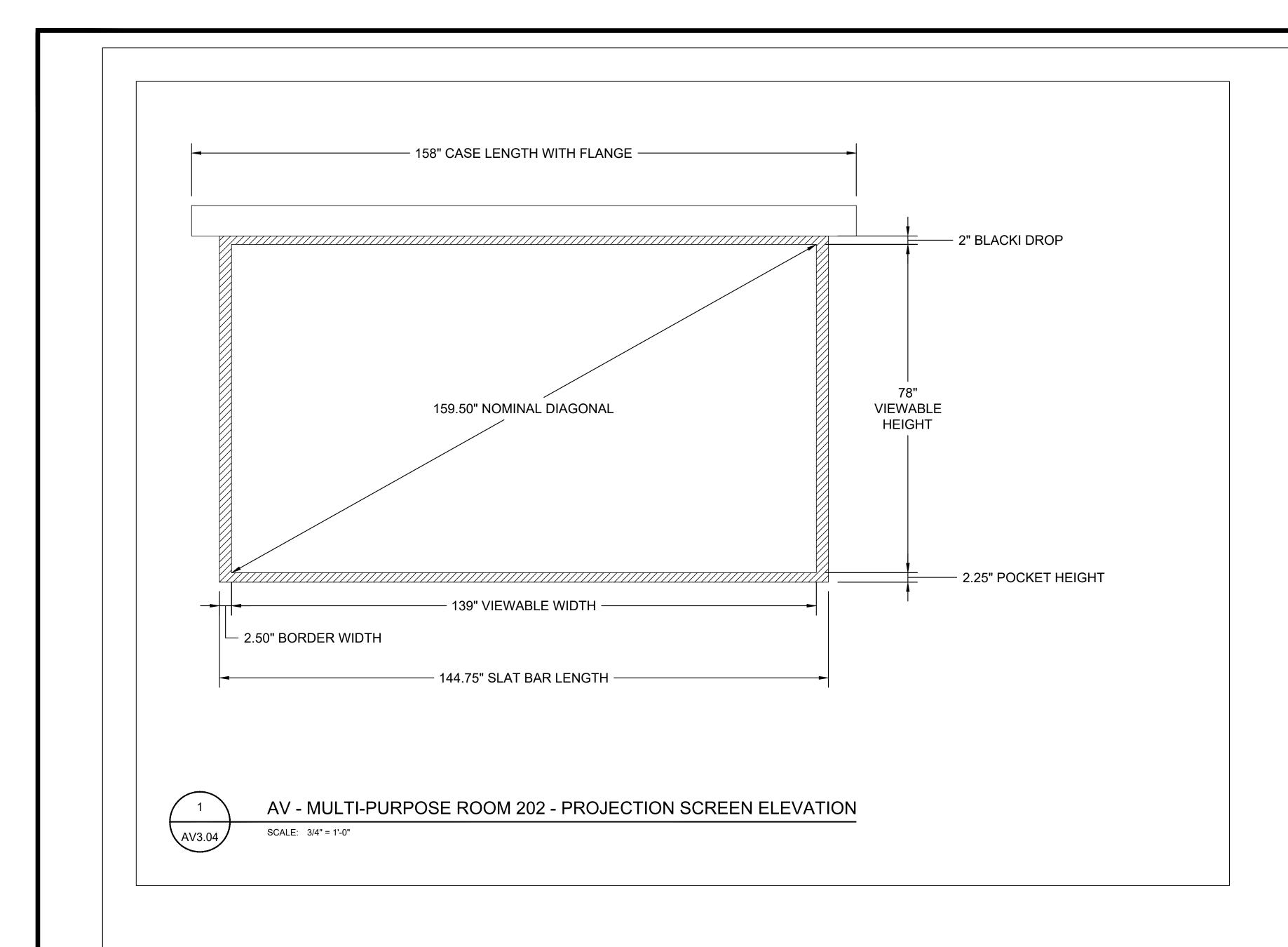
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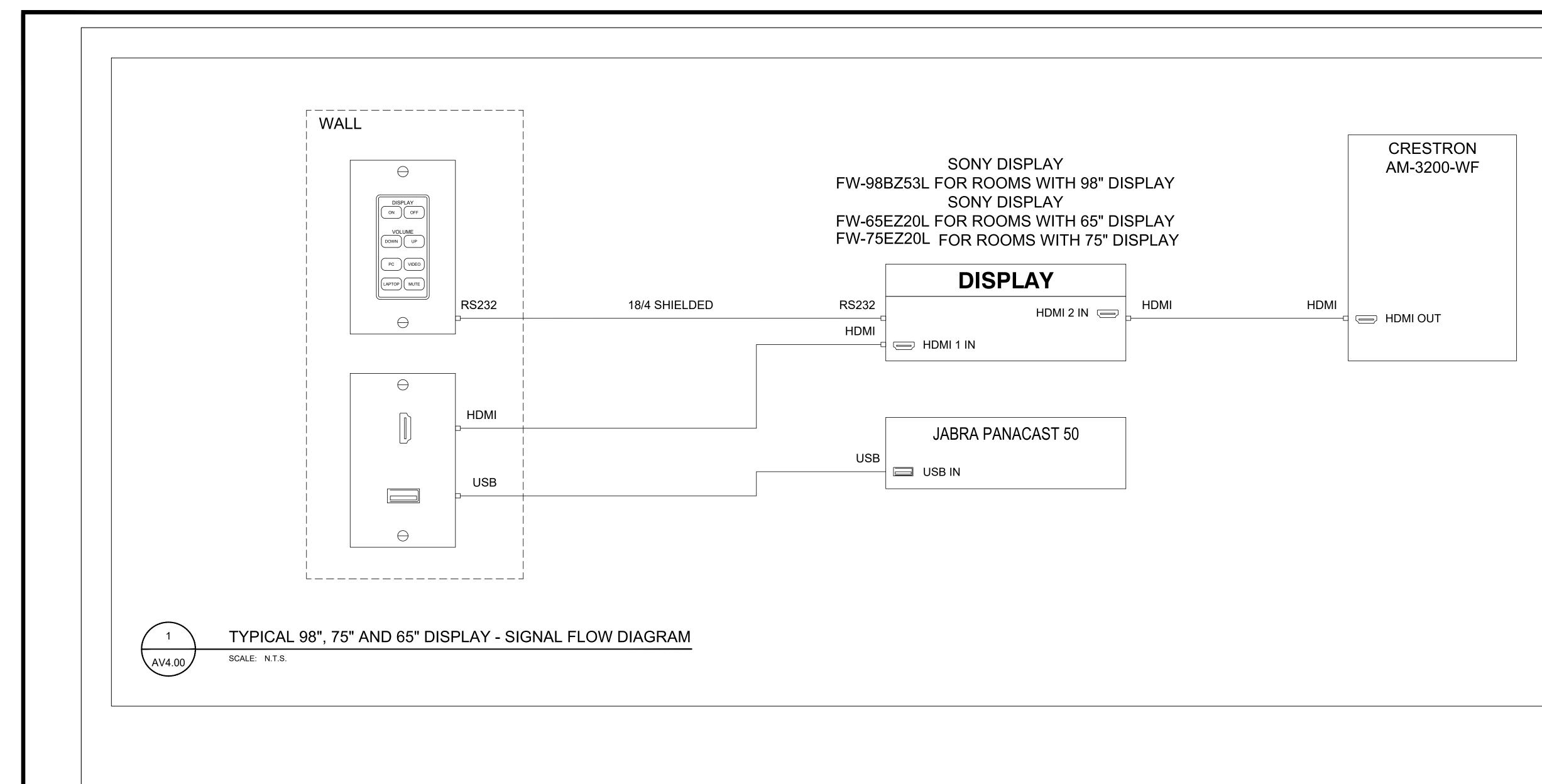
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BUILDING RENOVATIONS

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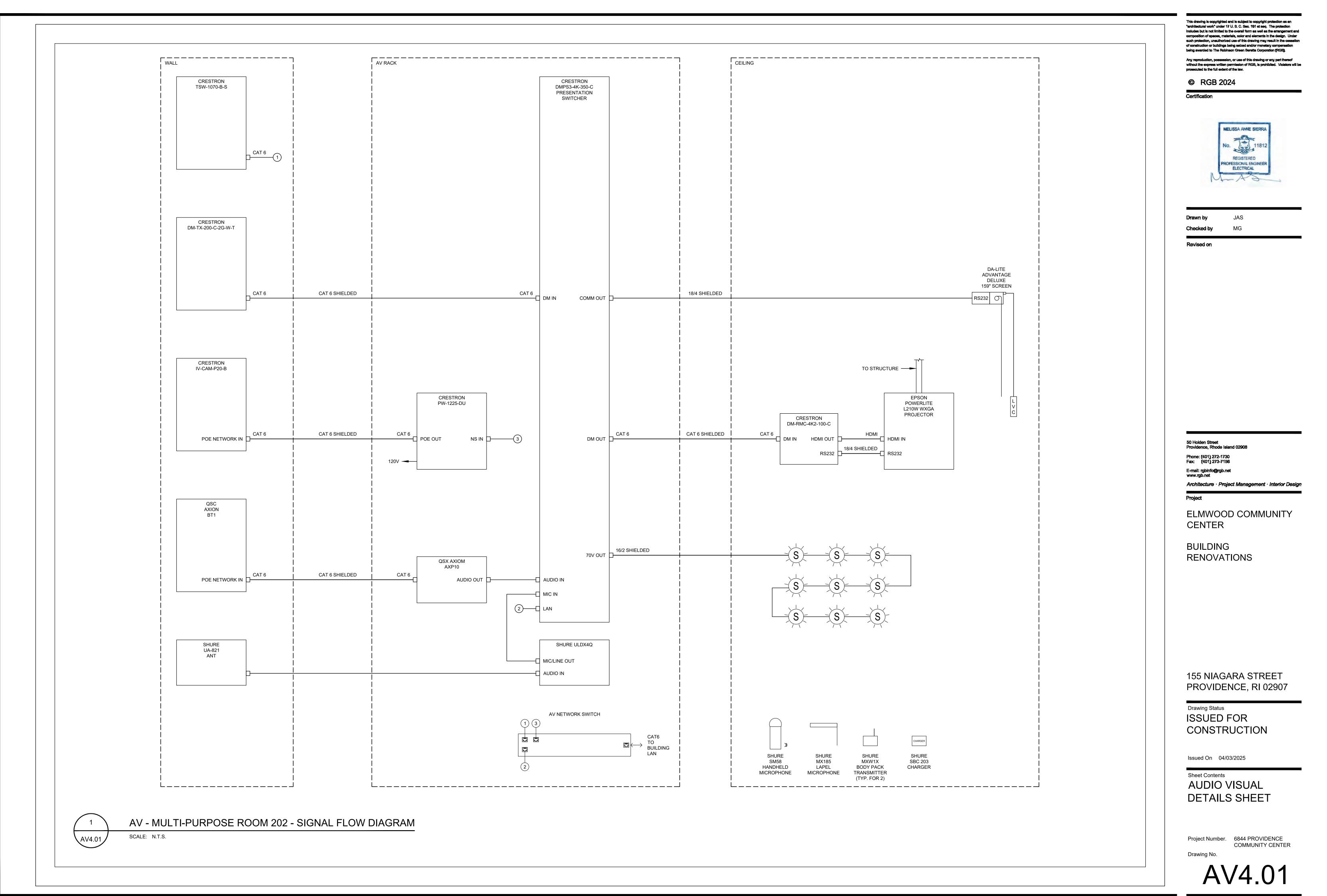
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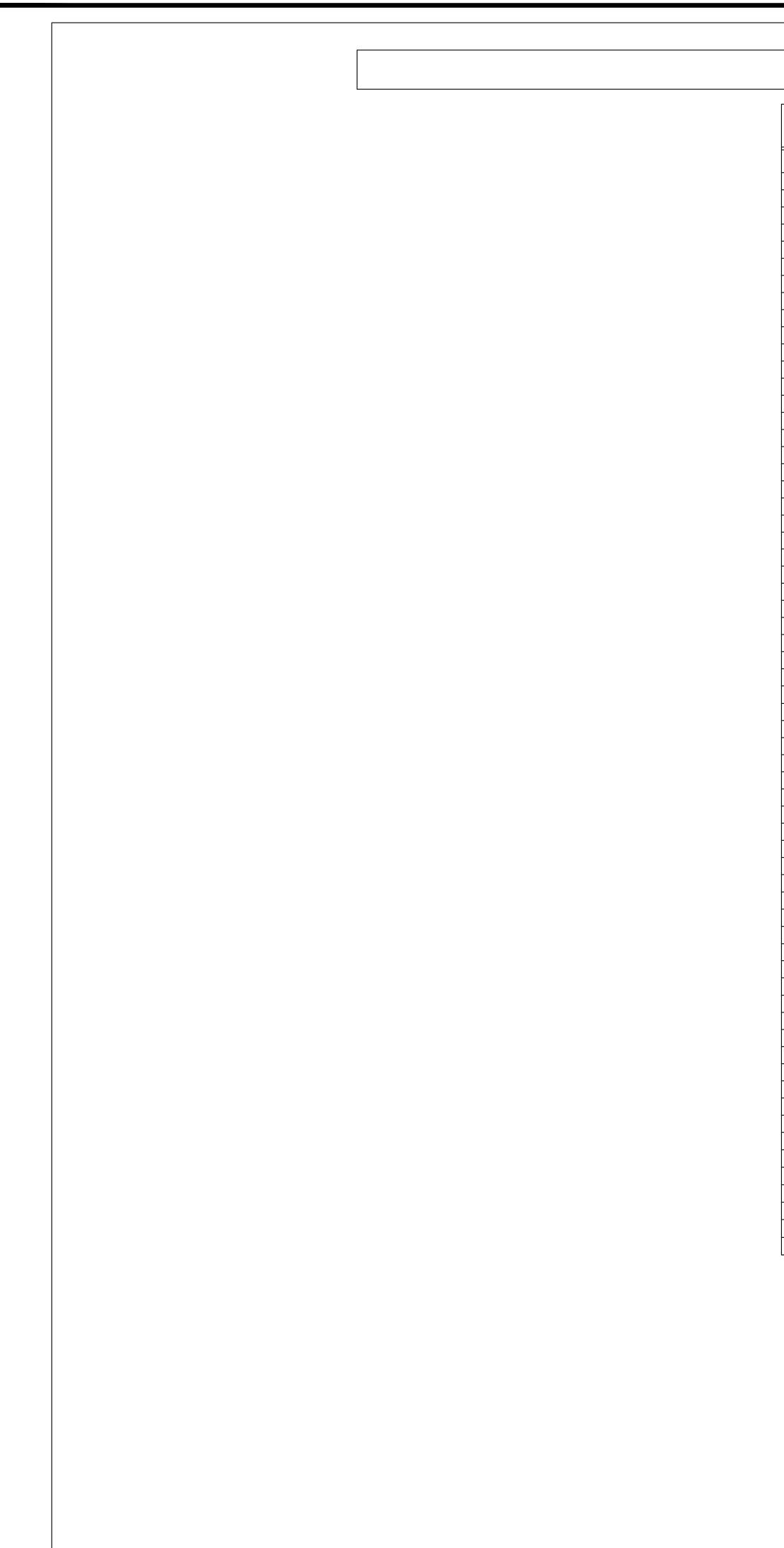
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Drawing No.

Project Number. 6844 PROVIDENCE COMMUNITY CENTER







# SECURITY LEGEND AND ABBREVIATIONS

# ABBREVIATIONS

ę	CENTERLINE			
AC	ABOVE COUNTER			
AFF	ABOVE FINISHED FLOOR			
ATR	ALL THREADED ROD			
AWG	AMERICAN WIRE GAUGE			
BFBI	BUILDER FURNISHED - BUILDER INSTALLED			
BMS	BUILDING MANAGEMENT SYSTEM			
С	CONDUIT			
ССТУ	CLOSED CIRCUIT TELEVISION			
CFD	CEMENT-FIBER DUCT			
CL	CLOSET			
CLG	CEILING			
COAX	COAXIAL CABLE			
СТ	CABLE TRAY			
CTR	CENTER			
DIA	DIAMETER			
DGP	DATA GATHERING PANEL			
DWG	DRAWING			
EC	ELECTRICAL CONTRACTOR			
ELEV	ELEVATOR			
ELEV				
EMT	ELECTROMAGNETIC INTERPERENCE			
EQPT FBO				
	FURNISHED BY OTHERS			
FC	FINISHED CEILING			
FCC	FIRE CONTROL CENTER			
FR				
FRP				
GFGI	GOVERNMENT FURNISHED - GOVERNMENT INSTALLED			
GC	GENERAL CONTRACTOR			
GND	GROUND			
HVAC	HEATING VENTILATION & AIR CONDITIONING			
IDF	INTERMEDIATE DISTRIBUTION FRAME			
IDP	INTRUSION DETECTION PANEL			
IMC	INTERMEDIATE METAL CONDUIT - SEE NEC ARTICLE 342			
JB				
LAN				
LEC				
MDF				
MM	MULTI-MODE (OPTICAL FIBER)			
MTD	MOUNTED			
MTG	MOUNTING			
NEC	NATIONAL ELECTRICAL CODE - NFPA 70			
NESC	NATIONAL ELECTRICAL SAFETY CODE			
NIC	NOT IN CONTRACT			
NTS	NOT TO SCALE			
OSP	OUTSIDE PANT			
PNL	PANEL			
PR	PAIRS-NUMBER OF PAIRS IN COPPER CABLE			
PVC	POLYVINYL CHLORIDE			
RM	ROOM			
RMC	RIGID METAL CONDUIT - SEE NEC ARTICLE 344			
RU	RACK UNIT; UNIT OF PATCH PANEL HEIGHT EQUAL TO 1.75 INCH			
SCC	SECURITY CONTROL CENTER			
SDF	SECURITY DISTRIBUTION FRAME			
SM	SINGLE-MODE (OPTICAL FIBER)			
STP	SHIELDED TWISTED PAIR			
TBD	TO BE DETERMINED			
тс	TELECOMMUNICATIONS CONTRACTOR			
TEL	TELECOMMUNICATION			
ТҮР	TYPICAL			
UON	UNLESS OTHERWISE NOTED			
UTP	UNSHIELDED TWISTED PAIR			
011				
WP	WEATHERPROOF			

LOW	VOLTAGE WIRING DEVICE LEGEND	LEGEND NOTES		
CR M / E	CARD READER LOCATION (1) - 22/6 SHIELDED E = EXISTING TO REMAIN; M = MULLION READER W = WIRELESS LOCKS		THIS SHEET IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS AND SHALL BE USED AS A DICTIONARY TO DEFINE ITEMS INDICATED ON DRAWINGS. NOT ALL SYMBOLS OR ABBREVIATIONS ARE NECESSARILY USED ON THIS PROJECT.	
DC	DOOR CONTACT LOCATION (1) - 18/4 SHIELDED FOR DOOR CONTACT			
RE	REQUEST TO EXIT LOCATION (1) - 18/4 SHIELDED	DRAWING LIST		DRAWING LIST
	(1) - 18/4 SHIELDED		SE0.01	SECURITY - LEGEND AND NOTES SHEET
	ELECTRIFIED LOCK LOCATION		SE1.00	SECURITY - FIRST FLOOR PLAN
EL	EL (1) - 16/2 SHIELDED		SE1.01	SECURITY - BASEMENT AND SECOND FLOOR PLAN
			SE2.00	SECURITY - DETAILS SHEET
ES	ELECTRIC STRIKE (1) - 16/2 SHIELDED			
PB	PANIC BUTTON (1) - 18/4 SHIELDED			
MS	MOTION SENSOR LOCATION (1) - 18/4 SHIELDED			
KP	KEY PAD LOCATION (1) - 18/4 SHIELDED			
VIC	VIDEO INTERCOM LOCATION			
JB	4-11/16" JUNCTION BOX			

# SECURITY NOTES:

- 1. TELECOM CONTRACTOR SHALL RUN DATA CABLING FOR ALL SECURITY CAMERA AND VIDEO INTERCOMS.
- 2. SECURITY CONTRACTOR TO REFER TO TELECOM DRAWINGS FOR ADDITIONAL INFORMATION/.

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ELMWOOD COMMUNITY CENTER

BUILDING RENOVATIONS

# 155 NIAGARA STREET PROVIDENCE, RI 02907

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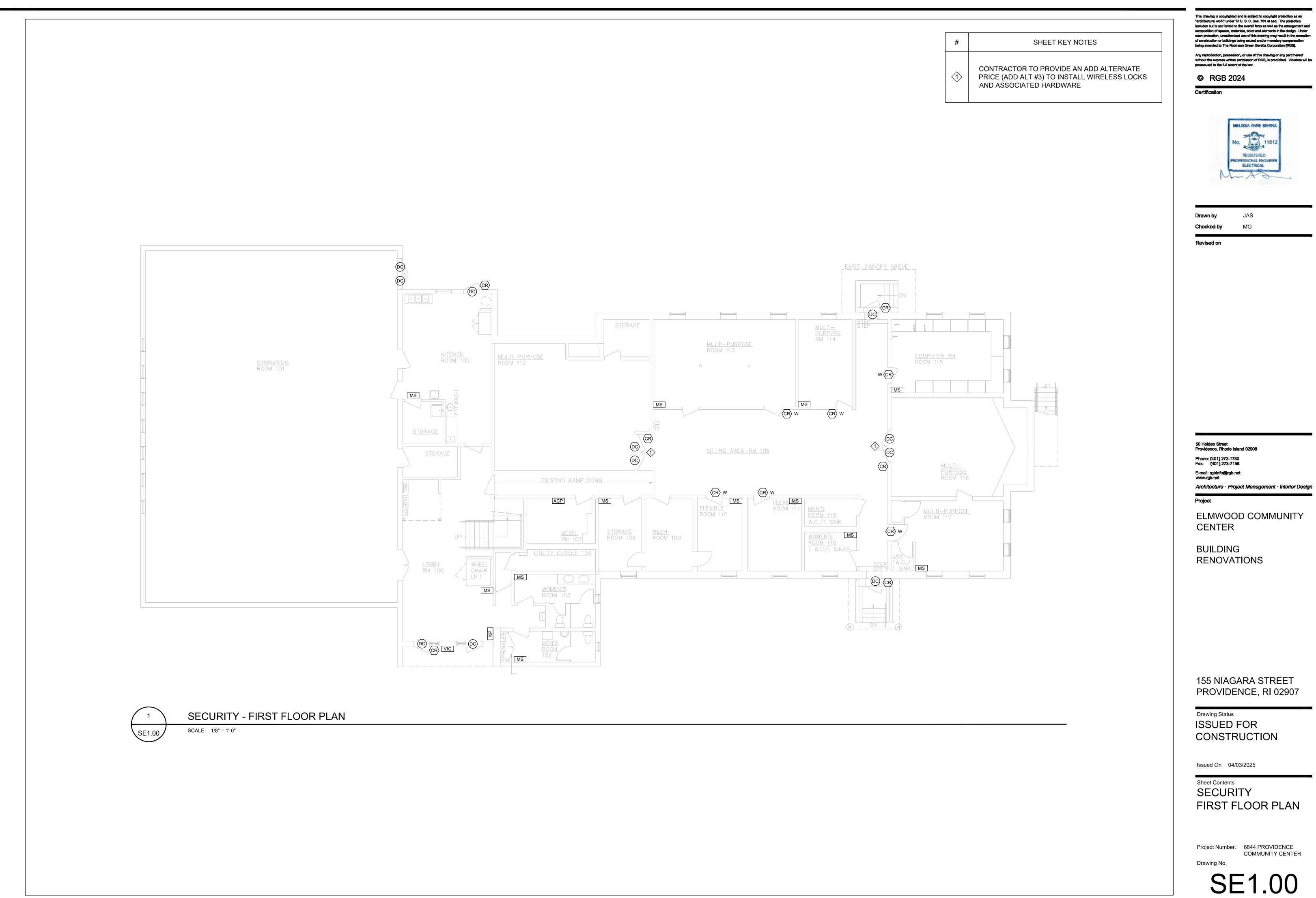
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Sheet Contents SECURITY LEGEND AND NOTES SHEET

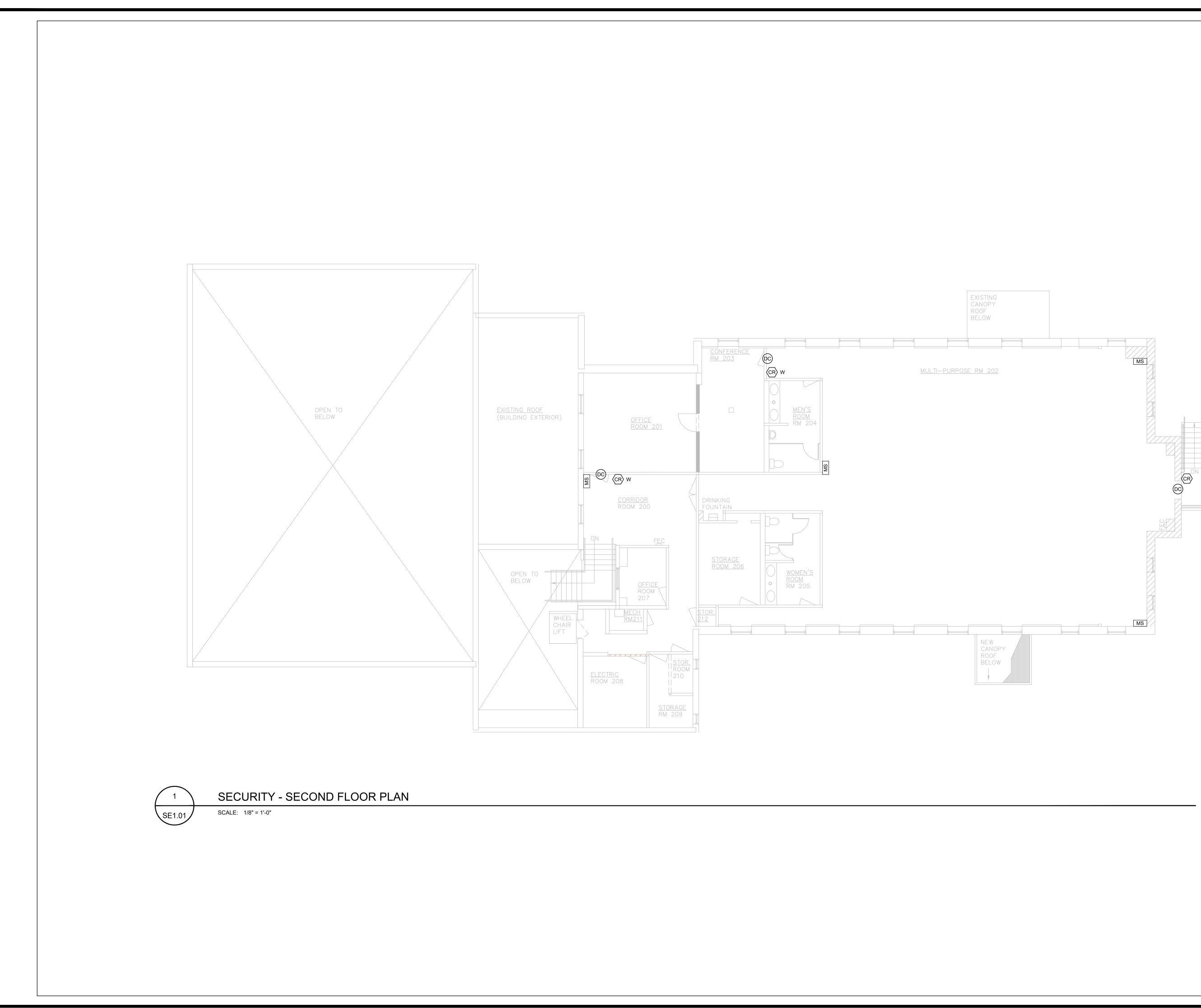
Project Number. 6844 PROVIDENCE COMMUNITY CENTER

Drawing No.

SE0.01



SE1.00



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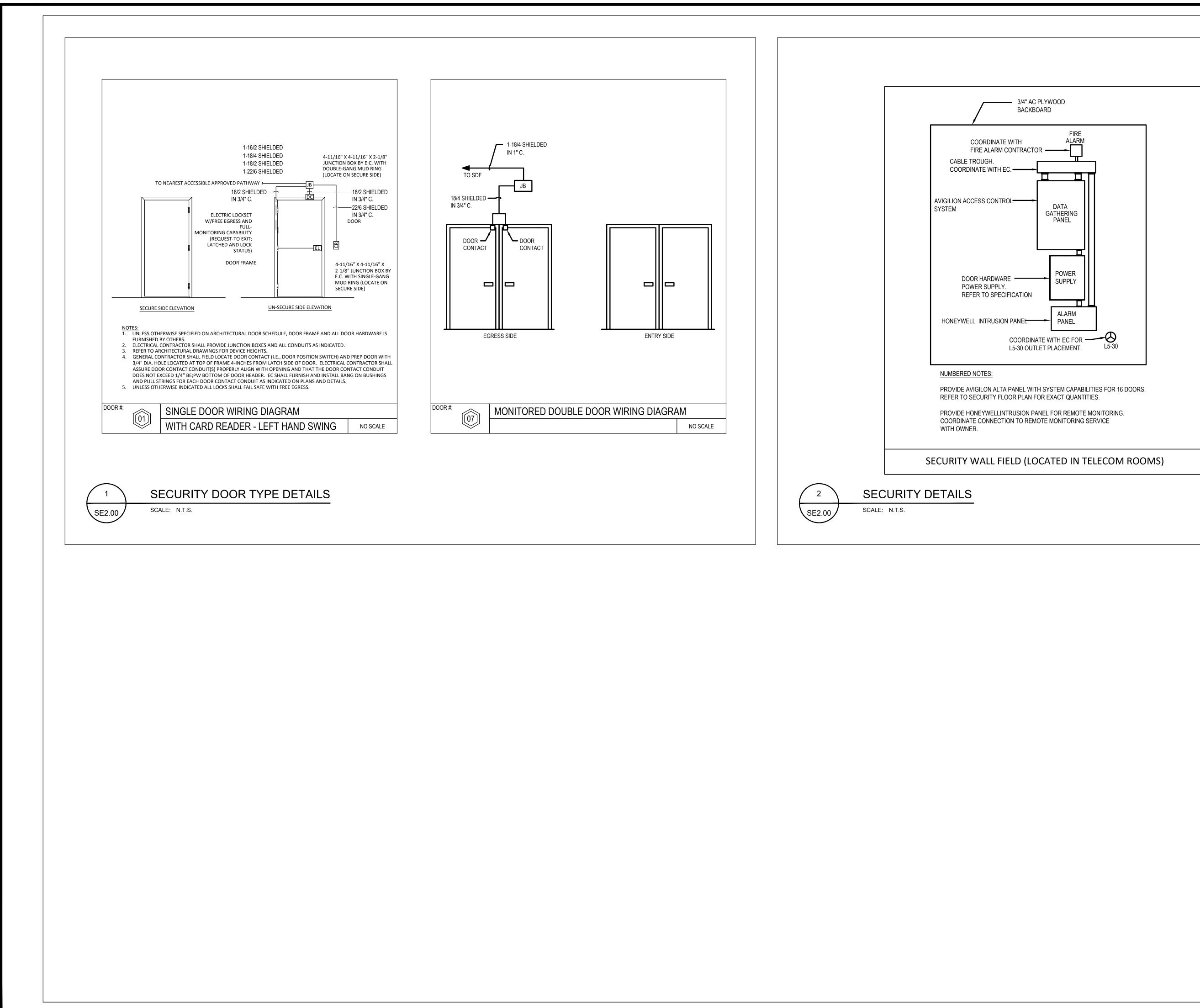
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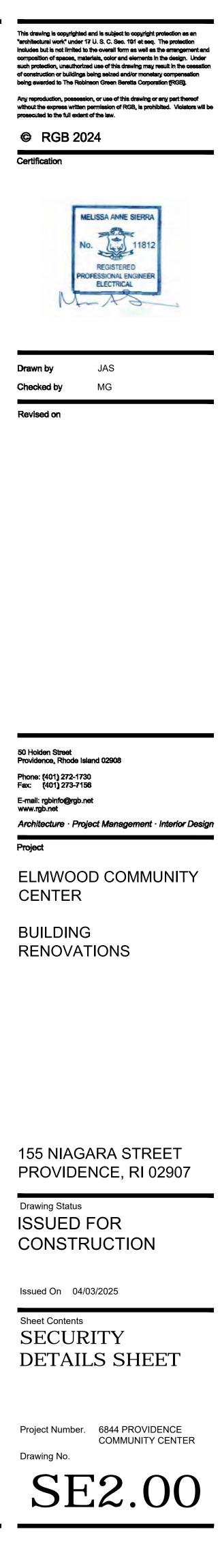
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Sheet Contents SECURITY SECOND FLOOR PLAN

Project Number. 6844 PROVIDENCE COMMUNITY CENTER







# **PROJECT MANUAL SPECIFICATION**

BID DOCUMENTS (DIVISION 00 - 33)

# Elmwood Community Center Building Renovations

# City of Providence



# 155 NIAGARA STREET PROVIDENCE, RI 02907

04/02/2025 RGB #6844

# PROJECT MANUAL SPECIFICATION

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# BID BOND

AIA Document A310 - Bid Bond - 2010 Edition is included, following this page, as an integral part of the Bid documents, and issues of this form signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual.

END OF SECTION

# $AIA^{\circ}$ Document A310<sup>°</sup> – 2010

# **Bid Bond**

# CONTRACTOR:

(Name, legal status and address)

### SURETY:

(Name, legal status and principal place of business)

OWNER: (Name, legal status and address)

# **BOND AMOUNT: \$**

Init.

1

PROJECT: (Name, location or address, and Project number, if any)

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

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Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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Signed and sealed this day of ,

	(Contractor as Principal)	(Seal)
(Witness)	(Title)	
	(Surety)	(Seal)
(Witness)	(Title)	



# Performance Bond

# CONTRACTOR:

(Name, legal status and address)

### SURETY:

(Name, legal status and principal place of business)

# OWNER:

(Name, legal status and address)

# CONSTRUCTION CONTRACT Date: Amount: \$ Description: (Name and location)

# BOND

Date: (Not earlier than Construction Contract Date)

Amount: \$	1. The second	
Modifications to this Bond:	None	See Section 16

CONTRACT	OR AS PRINCIPAL	SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and		Name and	
Title		Title	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY - Name, address and telephone) AGENT or BROKER: **OWNER'S REPRESENTATIVE:** (Architect, Engineer or other party:)

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§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the

1

Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

# § 14 Definitions

Init.

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page)



# **Payment Bond**

# CONTRACTOR:

(Name, legal status and address)

### SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

# CONSTRUCTION CONTRACT Date: Amount: \$ Description: (Name and location)

# BOND

Date: (Not earlier than Construction Contract Date)

Amount: \$		
Modifications to this Bond:	None	See Section 18
CONTRACTOR AS PRINCIPAL	SURETY	

(Corporate Seal) Company:

SURETY (Corporate Seal) Company:

Signature:	Signature:
Name and	Name and
Title:	Title:
(Any additional signatures app	ear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY - Name, address and telephone) **OWNER'S REPRESENTATIVE:** AGENT or BROKER: (Architect, Engineer or other party:) ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Init. 1

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

### § 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim:
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of add CONTRACTOR AS PRINCIPAL		ded parties, other than those appearing on the cover page.) SURETY	
Corporate Seal)	Company:	(Corporate Seal)	
Signature:			
Name and Title: Address:		Name and Title: Address:	
	Corporate Seal)	Corporate Seal) SURETY Company: Signature: Name and Title:	

# SECTION 00 06 10 - PERFORMANCE BOND; PAYMENT BOND

# PERFORMANCE BOND

AIA Document A312 - Performance Bond - 2010 Edition is included, following this page, as an integral part of the Bid documents, and issues of this form signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual.

# PAYMENT BOND

AIA Document A312 - Payment Bond - 2010 Edition is included, following this page, as an integral part of the Bid Documents, and issues of this form, signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual

END OF SECTION

# SECTION 00 04 50 - LETTER OF INTENT

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

FOR: \_\_\_\_

To Whom it may concern:

This is to advise you that the \_\_\_\_\_

(Legal Name of Surety)

who is authorized to do business in the State of Rhode Island, is prepared to execute a Performance Bond and Labor and Material Payment Bond, AIA Document A312, each in the amount of 100 percent of the Contract, for the: Elmwood Community Center Building Renovations.

(Legal Name of General Bidder)

should they be awarded a contract for the construction of the

(Name of Surety)

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

(Authorized Representative)

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

Print or Type name: \_\_\_\_\_

Date:

END OF SECTION 00 65 00

# SECTION 007400 – LABOR REQUIREMENTS

Wage Determination

- 1. Bids are subject to M.G.L. c. 149 Prevailing Wage Rates apply to this project as determined by the Rhode Island Department of Labor Standards and the U.S. Dept. of Labor.
- 2. Comply with the Code of Federal Regulations Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction 29 CFR 5.5
- 3. Davis Bacon and related Acts

The contractor must comply with the minimum rates for wages for laborers and mechanics as determined by the Secretary of Labor in accordance with the provisions of the Davis-Bacon and Related Acts. The Contractor must provide written certification that they and their subcontractors have complied with the requirements of the Davis-bacon and related Acts for the period during which the work was performed.

Other:

1. Comply with Section 000020 - City of Providence, RI Board of Contract & Supply Request for Proposal.

END OF SECTION 00 74 00

SECTION 01 10 00 - SUMMARY OF THE WORK

GENERAL

RELATED DOCUMENTS

- A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of the Specification are a part of this Section, which shall consist of all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services necessary for the proper execution and completion of the work, whether temporary or permanent and whether or not incorporated or to be incorporated in the work; and as related to the project or projects defined in the Bidding Requirements.
- B. The specification format used herein is in accordance with MASTERFORMAT, CSI and in no way intends to restrict this Contractor from expediting his work as they see fit. There is no intention of segregating the units of work as related to specific trades involving jurisdictional problems.
- C. WORK COVERED BY CONTRACT DOCUMENTS
- D. Project Identification: Elmwood Community Center Building Renovations
- E. Project Location: 155 Niagara Street, Providence RI 02902
- F. Owner: City of Providence, Rhode Island
- G. Architect: RGB Architects 50 Holden Street, 4<sup>th</sup> floor, Providence, RI 02908
- H. Contractor: To be determined.

# SUMMARY OF THE WORK

I. The scope of the work on this project includes but is not limited to:

Modifications to the interior of the building include Audio visual, power and data and security upgrades. A drop-down screen and projector and manual shades will be added to the existing Social Hall. Also included is new interior signage throughout, new door hardware and card readers, and replacement of the existing hot water tank. An existing interior wall will be removed and replaced with a new wall and door opening. New flooring at the existing kitchen. At the building exterior, a new canopy will be added at the location of an existing exterior door on the south side of the building. Exterior upgrades include masonry restoration work and connecting existing downspouts to underground drainage.

# CONTRACTOR'S DUTIES

- 1. The Contractor is responsible for all personnel involved in the work, including those of his direct employ, his sub-contractors and suppliers of materials and equipment and/or labor. The Technical Specifications have been divided for convenience only to cover the scope of work, and where reference to a particular contractor is noted, it is for convenience only. The Owner and Architect only recognize one Contractor as party to this Contract.
- As it is impractical to enumerate every piece of equipment or device required for proper operation, Sections or Divisions of the Project Manual; call for material and systems required to ensure proper operation of the roof to be provided as a part of the Work of

this Project. To infer the intent is otherwise is to render the specified work or system less than required.

- 3. Except as specifically noted, provide and pay for:
  - a) Labor, materials, and equipment.
  - b) Tools, construction equipment, and machinery.
  - c) Other facilities and services necessary for execution and completion of the Work.
- J. Secure and pay for, as necessary for proper execution and completion of the Work, and as applicable at the time of receipt of Bids:
  - 1. Permits.

All permit fees and obtaining the construction permits is the responsibility of the Contractor, unless noted otherwise.

- 2. City, Town, or Government fees.
- 3. Licenses.
- 4. Utility connection fees
- K. Give the required notices for operations that may disturb the function of the facility.
- L. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on the performance of the Work.
- M. Promptly submit a written notice, within five business days of discovery, to the Architect of observed variance of Contract Documents from legal requirements.
- N. Enforce strict discipline and good order among employees. Do not employ people who are not skilled in the assigned task.
- O. Notify all trades, sub-contractors and suppliers of all designated alternatives and be responsible for their coordination.
- P. At your option, certain indicated materials and/or procedures are specified herein to be used in lieu of other indicated materials and/or procedures, at no change in Contract Price. Such options should be analyzed and coordinated during the bidding period, so that the selection of any will be brought to the Architect's attention once the Contract is awarded (within thirty days thereafter).

HEALTH AND SAFETY PRECAUTIONS

- A. OSHA:
  - These construction documents, and the joint and several phases of construction hereby contemplated, are to be governed, at all times, by the applicable portions of the Federal Laws, including but not limited to, the latest amendments of the following: Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 91-956; Part 1910 - Occupational Safety and Health Standards, Title 29, Code of Federal Regulations, as amended to date. Part 1926 - Safety and Health Regulations for Construction, Title 29, Code of Federal Regulations, as amended to date.
  - 2. This Project, the Contractor and his sub-contractors shall, at all times, be governed by applicable Chapters of Title 29, Code of Federal Regulations, Part 1926 Safety and Health Regulations for Construction, as amended to date.
    - Note: Furnish the Owner and Architect copies of all accident reports.
- B. Emergencies:

- 1. Should tornado, hurricane, gale or heavy wind warnings be issued, take precautions to minimize the danger to persons, the work, and the adjacent property. Damage caused to any part of the work shall be rectified or replaced to the complete satisfaction of the Architect and Owner, at no expense to the Owner. Injury to personnel or damage to adjacent property because of the work shall be the complete responsibility of the Contractor, and they accept exclusive responsibility for same.
- C. Loading:
  - Do not load any part of the existing work involved in this Contract, during construction, with a load greater than it is calculated to carry with safety. Should any accidents or damage occur through any violation of this requirement, the Contractor shall be held responsible under their Contract and Bond. When, in the opinion of the Architect, portions of the existing areas appear to be overloaded, it shall be the Contractor's responsibility to prove otherwise, or the Contractor shall follow the instructions of the Architect in connection with the reduction of the loads.
  - 2. Contractor to review existing site conditions. Protect systems from damage. Repair or replace any existing to remain systems unless noted otherwise.

# PROJECT RECORD DOCUMENTS

- D. Maintain at the job site, one copy of:
  - 1. Contract Drawings, Specifications, Addenda, Reviewed Shop Drawings, Record Drawings, Approved materials, samples, and color selections.
- E. Store documents in an approved location, apart from documents used for construction.
- F. Maintain documents in clean, dry, legible condition.
- G. Do not use record documents for construction purposes.
- H. Documents shall always be available for inspection by the Architect and Owner.
- I. Recording changes:
  - 1. Keep record documents current.
  - 2. Do not permanently conceal any work until the required information has been recorded.
  - 3. Contract Drawings: Legibly mark to record actual construction and the following:
  - Record field changes of dimensions and details.
  - Record changes made by Change Order or Field Order.
  - Record details not on original Contract Drawings.
  - 4. Specifications and Addenda: Legibly mark up each Section to record the following: Manufacturer, name, number, and supplier of each product and item actually installed. Changes made by Change Order and Field Directive. Other matters and materials not previously specified.
  - 5. Shop Drawings: Maintain as record documents; legibly annotate drawings to record changes after review.

# TRANSPORTATION AND HANDLING

- A. Transport all materials and equipment on legally approved conveyances as required or recommended by the respective manufacturer or supplier.
  - 1. Obtain permits, as required.
- B. Receive and handle all materials and equipment, at the project site, by conveyances or methods as recommended by the respective manufacturer or supplier.

- C. Coordinate delivery of equipment and materials when two or more trades, contractors or suppliers, are involved.
- D. Remove from the site any material or item of equipment damaged during the transportation or handling process and immediately replace it at no additional cost to the Owner.

# STORAGE AND PROTECTION

- A. Store all materials and equipment as recommended by respective manufacturers or suppliers, including the following minimum requirements.
- B. Upon receipt of materials and equipment, check, distribute, store, and safeguard in a clean, dry location.
- C. Items stored in exterior locations elevate off the ground and completely cover them appropriately. Always protect against the elements.
- D. All storage areas shall be always maintained in a clean and orderly condition.
- E. Immediately replace any material or item damaged due to inadequate storage protection, at no additional cost to the Owner.

# CUTTING AND PATCHING

- A. Execute cutting, fitting or patching work to:
  - 1. Make component parts fit properly.
  - 2. Uncover work to provide for installation of ill-timed work.
  - 3. Remove and replace any defective work.
  - 4. Remove and replace work not conforming to the Contract Documents.
  - 5. Remove samples of installed work, as specified, for testing.
  - 6. Install specified work in existing construction.
- B. In addition to the Contract requirements, upon written instructions from Architect:
  - 1. Uncover work to provide for Architect's observation of covered work, as required by General Conditions.
  - 2. Remove samples of materials installed for testing as required by General Conditions.
- C. Do not endanger any work by cutting or altering work, or any part of it.
- D. Do not cut or alter the work of another Contractor without written permission of the Architect.
- E. Prior to cutting any element which affects the structural safety of the Project, or the work of another Contractor, submit written notice to Architect requesting consent to proceed with cutting.
- F. Prior to cutting and patching, done on instruction of the Architect, submit written cost estimate.
- G. Should conditions of work, or schedule, indicate change of materials or methods, submit written recommendations to the Architect and Owner including:
  - 1. Conditions indicating the need for change.
  - 2. Recommendations for alternative materials or methods.
  - 3. Submittals required for Substitutions.
  - 4. Impact on operations and maintenance, both long and short term.

- H. Submit written notice to the Architect and Owner, designating time work will be uncovered, to provide for observation.
- I. Payment for costs caused by ill-timed or defective work, or work not conforming to the Contract Documents, including costs for additional services of Architect or other costs to the Owner will be borne by the Contractor.
- J. Contractor Inspection:
  - 1. Inspect existing conditions of work, and elements subject to movement or damage during the proposed construction Cutting and patching.
  - 2. After uncovering work, inspect conditions affecting installation of new products.
- K. Preparation: (prior to cutting)
  - 1. Provide shoring, and bracing support required to maintain structural integrity of the Project.
  - 2. Provide protection from the elements appropriate to fully protect other portions of the Project from dust, fumes, humidity, etc.
- L. Performance: Perform all work of fitting, adjustment, cutting, patching, finishing, and restoration to perfectly match the quality as specified throughout these specifications by trade persons skilled in the work being performed.

CONTRACTOR USE OF PREMISES

- A. Confine operations at the site to areas permitted by: Owner, Law, Ordinances, and Permits.
- B. Do not unreasonably encumber the site with materials and equipment.
- C. Do not load the structure with weight that will endanger the structure.
- D. Assume full responsibility for protection and safekeeping of products stored on the premises.
- E. Move any stored products which interfere with the operations of the Owner.
- F. Limit use of site for work and storage within confines of the Project Limit Line.
- G. Limit use of Project site to work in areas within the Contract limits indicated. Do not disturb portions of the Project site beyond areas in which the work is indicated.
  - 1. Confine construction operations to areas indicated/allowed by the Owner.
  - 2. Driveway, Walkways and Entrances: Keep driveway, parking, loading areas and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Schedule deliveries to minimize use of driveways and entrances by construction operations.

COORDINATION WITH OCCUPANTS

- A. Schedule early completion of designated areas for Owner's usage prior to Substantial Completion of the entire Project.
- B. Contractor to provide:
  - 1. Access for Owner & Building personnel.
  - 2. Operation of mechanical and electrical systems.
  - 3. Prior to occupancy, execute a Certificate of Substantial Completion for designated areas.

WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Contractor to coordinate work hours with Owner.
  - 1. Coordinate with owner on operation of facility, and extent to be maintained during construction.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
  - 1. Notify Owner not less than three days in advance of any proposed utility interruptions.
  - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
  - 1. Notify Owner not less than three days in advance of proposed disruptive operations. Obtain Owner's written permission before proceeding with work.
- E. Nonsmoking Building: Smoking or Mechanical Vaporization is not permitted within 50 feet of entrances, operable windows, or outdoor-air intakes.

END OF SECTION 01 10 00

# SECTION 01 10 10 – CONTRACT LIST OF DRAWINGS

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
  - A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of the specification are a part of this Section, which shall consist of all labor, equipment and materials necessary to complete all project meeting work indicated on the drawings and herein specified.
- 1.2 CONTRACT LIST OF DRAWINGS:

CIVIL

- A. C1 GENERAL NOTES & LEGENDS
- B. C2 SITE & UTILITY PLANS
- C. C3 CONSTRUCTION DETAILS

# ARCHITECTURAL

- D. COVER SHEET
- E. G001 ABBREVIATIONS & SYMBOLS
- F. A000 CODE REVIEW SUMMARY
- G. A010 CODE REVIEW PLAN
- H. A020 CODE REVIEW PLAN
- I. D100 FIRST FLOOR DEMO PLAN
- J. D101 SECOND FLOOR DEMO PLAN
- K. A100 FIRST FLOOR PLAN
- L. A101 SECOND FLOOR PLAN
- M. A200 EXTERIOR ELEVATION
- N. A201 EXTERIOR ELEVATION
- O. A202 EXTERIOR ELEVATION
- P. A203 EXTERIOR ELEVATION
- Q. A204 EXTERIOR ELEVATION
- R. A400 CANOPY SECTION + FRAMING

- S. A500 DETAILS
- T. A601 SECOND FLOOR DEMO REFLECTED CEILING PLAN
- U. A700 INTERIOR ELEVATIONS
- V. A900 FIRST FLOOR FINISH PLAN
- W. A901 SECOND FLOOR FINISH PLAN
- X. A910 DOOR SCHEDULE & DETAILS

# ELECTRICAL

- A. E000 ELECTRICAL SYMBOLS LISTS, ABBREVIATIONS AND NOTES
- B. E301 ELECTRICAL POWER PLAN FIRST FLOOR
- C. E302 ELECTRICAL POWER PLAN SECOND FLOOR
- D. E501 ELECTRICAL ONE LINE DIAGRAM
- E. E601 ELECTRICAL DETAILS
- F. E701 ELECTRICAL SCHEDULES
- G. E801 ELECTRICAL SPECIFICATIONS
- H. E802 ELECTRICAL SPECIFICATIONS CONT.

# TELECOMMUNICATIONS

- A. TC0.01 TELECOM LEGEND AND NOTES SHEET
- B. TC1.00 TELECOM FIRST FLOOR PLAN
- C. TC1.01 TELECOM SECOND FLOOR PLAN
- D. TC2.00 TELECOM DETAIL SHEET
- E. TC2.01 TELECOM DETAIL SHEET

# AUDIO VISUAL

- A. AV0.01 AUDIO VISUAL LEGEND AND NOTES SHEET
- B. AV1.00 AUDIO VISUAL FIRST FLOOR PLAN
- C. AV1.01 AUDIO VISUAL SECOND FLOOR PLAN
- D. AV2.00 AUDIO VISUAL DETAILS SHEET

- E. AV2.01 AUDIO VISUAL DETAILS SHEET
- F. AV2.02 AUDIO VISUAL DETAILS SHEET
- G. AV2.03 AUDIO VISUAL DETAILS SHEET
- H. AV2.04 AUDIO VISUAL DETAILS SHEET
- I. AV2.05 AUDIO VISUAL DETAILS SHEET
- J. AV2.06 AUDIO VISUAL DETAILS SHEET
- K. AV2.07 AUDIO VISUAL DETAILS SHEET
- L. AV2.08 AUDIO VISUAL DETAILS SHEET
- M. AV3.00 AUDIO VISUAL DETAILS SHEET
- N. AV3.01 AUDIO VISUAL DETAILS SHEET
- O. AV3.02 AUDIO VISUAL DETAILS SHEET
- P. AV3.03 AUDIO VISUAL DETAILS SHEET
- Q. AV3.04 AUDIO VISUAL DETAILS SHEET
- R. AV4.00 AUDIO VISUAL DETAILS SHEET
- S. AV4.01 AUDIO VISUAL DETAILS SHEET

# SECURITY

- A. SE0.01 SECURITY LEGEND AND NOTES SHEET
- B. SE1.00 SECURITY FIRST FLOOR PLAN
- C. SE1.01 SECURITY SECOND FLOOR PLAN
- D. SE2.00 SECURITY DETAILS SHEET

END OF SECTION 01 10 10

SECTION 01 20 00 - PROJECT MEETINGS

PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

- A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of the specifications are a part of this Section, which shall consist of all labor, equipment and materials necessary to complete all project meeting work indicated on the drawings and herein specified.
- 1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE
  - A. Summary of the Work: Section 01 10 00.
  - B. Project Management and Coordination: Section 01 31 00.
  - C. Construction Progress Documentation: Section 01 32 00.
  - D. Submittal Procedures: Section 01 33 00.
- 1.3 PRE-INSTALLATION CONFERENCES:
  - A. Masonry Restoration Installation Conference.

# 1.4 PRECONSTRUCTION MEETING

A. Scheduled, by the Architect, within ten days after Notice to Proceed.

# B. Attendance:

- 1. Owner or Representatives.
- 2. Architect and his Consultants.
- 3. Contractor.
- 4. Major Sub-contractors.
- 5. Safety Representative.
- C. Minimum Agenda:
  - 1. Distribution and discussion of:
    - a. List of Major Sub-contractors.
    - b. Tentative Construction Schedule.
  - 2. Critical work sequencing.
  - 3. Relation and coordination of Contractors.

- 4. Designation of personnel responsible.
- 5. Processing of field decisions and Change Orders.
- 6. Adequacy of distribution of Contract Documents.
- 7. Submittal of shop drawings, project data and samples.
- 8. Procedures for maintaining record documents.
- 9. Use of Premises:
  - a. Site access and storage/staging areas.
  - b. Owner's requirements.
- 10. Major equipment deliveries and priorities.
- 11. Housekeeping procedures.
- 12. Procedures for Project Closeout, including "punch list" preparation and "Substantial Completion" requirements.

# 1.5 PROGRESS MEETINGS

- A. Scheduled, agendas prepared and administered by the Contractor.
  - 1. Distribute written notices and agendas of Regular and Called Meetings, three days in advance of meeting date.
  - 2. Make physical arrangements for meetings as required. For virtual meetings via Microsoft Teams or another approved platform may be accepted where in person meetings are not required.
  - 3. Preside at meetings.
  - 4. Record meeting minutes, that include significant decisions or proceedings.
  - 5. Distribute copies to all attendees, within three days after the meeting.
- B. Architect will attend meetings to ascertain that Work is expedited consistent with Construction Schedule and with the Contract Documents.
- C. Schedule Regular Meetings on a day and time agreeable to all parties.
- D. Hold Called Meetings as progress of the Work dictates.
- E. Location of meetings, as indicated in the Notice.
- F. Attendance:
  - 1. Owner or Representative, when required.
  - 2. Architect and his Consultants, as required.
  - 3. Contractor.
  - 4. Subcontractors, pertinent to agenda.
  - 5. Safety Representative.
- G. Minimum Agenda:
  - 1. Review and approve minutes of previous meeting.
  - 2. Review Work progress since last meeting.
  - 3. Note field observations, problems and decisions.
  - 4. Identify issues/items that may impede progress.

- 5. Develop corrective measures to regain planned schedule.
- 6. Revise Construction Schedule as required.
- 7. Plan progress during next work period. Coordinate with other Contractors.
- 8. Review submittal schedules, expedited to maintain schedule.
- 9. Review quality and work standards.
- 10. Review changes proposed by the Owner for:
  - a. Effect on Construction Schedule.
  - b. Effect on Completion Schedule.
- 11. Other current business.

END OF SECTION 012000

# SECTION 01 21 00 - ALLOWANCES

# PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of the specifications are a part of this Section, which shall consist of all labor, equipment and materials necessary to complete all allowance work indicated on the drawings and herein specified.

### 1.2 OTHER CASH ALLOWANCES

A. Should allowances be included in other Sections of these specifications, follow the procedures of this Section, but include the cost of same under the respective Sections.

## 1.3 CASH ALLOWANCES DEFINITION

- A. The amount of each allowance includes:
  - 1. Net cost of product and/or service.
  - 2. Delivery and unloading at site.
  - 3. All soft costs, such as engineering, design, drafting, etc.
- B. Include in the Base Bid amount, and not part of the amounts of the allowances, the costs for;
  - 1. Handling at the site, including uncrating and storage.
  - 2. Protection from elements and from damage.
  - 3. Labor, installation and finishing.
  - 4. Other expenses, including incidental/appurtenant materials and labor required to complete the installation.
  - 5. Overhead and profit.

# 1.4 CASH ALLOWANCES

- A. Purchase materials and/or services under each allowance as directed by the Architect.
- B. Include the following amounts in Bid, for inclusion in the Base Bid:
  - 1. <u>Painting Restoration Work</u>: \$10,000 to restore existing Murals and Artwork at exterior masonry to be repointed or repaired. Following masonry restoration work, masonry will be repainted to restore artwork to the condition of original artwork. Coordinate with Owner for artist / vendor to complete restoration work. Owner to select vendor / artist to complete restoration work. Lifts and access facilitated by General Contractor.
  - 2. <u>Landscape Material</u>: \$5000 allowance for landscape material. Final selections and locations to be selected by owner.
  - 3. <u>Miscellaneous Roof Repair</u>: \$15,000 allowance to review existing intermediate roof area. Replace any damaged PVC roof material and wet insulation with new to match existing

roof material and insulation type and thickness. Flash any new roofing material into existing roof material. Repair any worn or damaged seams.

4. <u>Masonry Repointing</u>: \$25,000 allowance for any additional repointing not already noted on the drawings or specifications.

# 1.5 PROCEDURES

- A. Selection of Materials:
  - 1. Assist Architect and Owner in determining qualified suppliers.
  - 2. Obtain proposals from suppliers when requested by Architect and Owner.
  - 3. Make appropriate recommendations for consideration by Architect and Owner.
  - 4. Notify Architect and Owner of any effect anticipated by selection of product or supplier under consideration on:
    - a. Construction Schedule.
    - b. Contract Sum.
    - c. Facility operations.
    - d. Impact on Owner furnished items.
  - 5. On notification of selection, enter into purchase agreement with designated supplier.
- B. Delivery:
  - 1. Arrange for delivery and unloading.
  - 2. Promptly inspect products for damage or defects.
  - 3. Submit claims for transportation damages.
- C. Installation:
  - 1. Comply with the requirements of the referenced specification section.
- D. Adjustment of Costs:
  - 1. Should the actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference, provided accounting of expenditures is current, and accurate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 02 10

# SECTION 01 22 00 - UNIT PRICE FORM

LIST OF UNIT PRICES

A. Provide the following unit prices as listed on the Bid Form: (Amounts below denote an indeterminate quantity assumed for comparison of bids.) No additional unit price work shall be completed without prior approval of the Owner/Architect as to the quantity, limit or extent of the additional work required.

### 1. Brick Masonry Repair:

- a. Description: Brick masonry veneer demolition and replacement/repair. New brick to match existing in size, shape, color and configuration. Masonry mortar to match joint size, texture, color, and pointing. Demolished materials to be removed and properly disposed of offsite.
- b. Amount per Unit of Measurement: \$\_\_\_\_\_/ Per 10 SF.

# 2. Brick Veneer Repointing Repair:

- a. Description: Brick masonry veneer repointing repair. Rake old mortar from existing brick joint. Apply new mortar, strike to match the existing joint configuration. New mortar to match texture, color, and pointing of adjacent wall. Demolished materials to be removed and properly disposed of offsite.
- b. Amount per Unit of Measurement: \$\_\_\_\_\_/ Per 10 SF.

END OF SECTION 01 22 00

(OSECTION 01 23 00 - ALTERNATES

## 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 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. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. 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: Revise 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 revisions 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 the schedule contain requirements for materials necessary to achieve the work described under each alternate.

# PART 2 - EXECUTION

- 2.1 SCHEDULE OF ADDITIVE ALTERNATES:
  - 1. <u>ADD ALTERNATE 1</u> Provide an add alternate cost for labor and materials to pressure wash all non-painted brick. Apply a sealer over all brick work that has been pressure washed. See drawings and Division 4 specifications for sealer type.
  - <u>ADD ALTERNATE 2</u> Provide an add alternate cost to demolish existing VCT flooring and wall base for approximately 4000 square feet of the first floor. Prep existing subfloor as required by flooring manufacturers for new floor finish. Level sub floor if needed. Provide labor and materials to furnish and install new LVT flooring and 4" high vinyl wall base to approximately 4000 square feet. Architect to select floor and wall base colors. Submit to Architect for review.
  - 3. <u>ADD ALTERNATE 3</u> Provide add alternate cost (or deduct if it applies) to remove existing door hardware at door 112.1 (multi-Purpose Room 112) and door 116.1 (Multi-Purpose Room 116) and replace with new door hardware that supports wireless lock and wireless lock. Base bid to include existing door hardware with new hardwired card access and all labor and materials, parts and accessories as required to provide power to card access, door / frame. See drawings and door hardware specifications.

END OF SECTION 01 23 00

# SECTION 01 25 00 - SUBSTITUTION PROCEDURES

# PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
  - 2. Divisions 02 through 33 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.

#### 1.4 ACTION 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 and/or facsimile of form provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication, or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by the Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of the applicable Specification Section. Significant qualities may include attributes such as performance, weight,

size,\_durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- i. 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.
- j. Cost information, including a proposal of change, if any, in the Contract Sum.
- k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- I. 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 seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager 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 a qualified testing agency to perform compatibility tests recommended by manufacturers.

# 1.6 PROCEDURES

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

# PART 2 - PRODUCTS

## 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the 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. The substitute 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: Generally, not allowed unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed and/or the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the 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. The substitute 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 provides specified warranty.
    - i. 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

END OF SECTION 01 25 00

# SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

# PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

## 1.3 MINOR CHANGES IN THE WORK

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

#### 1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

- 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
- 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
- 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
- 4. Include costs of labor and supervision directly attributable to the change.
- 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- 6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

# 1.5 CHANGE ORDER PROCEDURES

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

# 1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

The Construction Change Directive contains a complete description of changes in the Work. It also designates a method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION 01 26 00

# SECTION 01 29 00 - PAYMENT PROCEDURES

# PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

### 1.3 DEFINITIONS

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

#### 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items indicated as separate activities in Contractor's construction schedule.
  - 2. Submit the schedule of values to Architect at earliest possible date, but no later than ten days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the schedule of values:

- a. Project name and location.
- b. Name of Architect.
- c. Architect's project number.
- d. Contractor's name and address.
- e. Date of submittal.
- 2. Arrange schedule of values with format of AIA Document G703.
- 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
  - a. Related Specification Section or Division.
  - b. Description of the Work.
  - c. Name of subcontractor.
  - d. Name of manufacturer or fabricator.
  - e. Name of supplier.
  - f. Change Orders that affect value.
  - g. Dollar value of the following, as a percentage of the Contract Sum to nearest onehundredth percent, adjusted to total 100 percent.
    - 1) Labor.
    - 2) Materials.
    - 3) Equipment.
- 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
- 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
- 6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
- 8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
- 9. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

### 1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

- 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
  - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G703 as a form for Applications for Payment.
- D. Application for Payment Forms: Use forms provided by Owner for Applications for Payment. Sample copies are included in the Project Manual.
- E. Application Preparation: Complete every entry on the form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  - 1. Entries shall match data on the schedule of values and Contractor's construction schedule.
  - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  - 3. Include amounts of Change Orders issued before the last day of construction period covered by application.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
  - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  - 2. Provide supporting documentation that verifies the amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  - 3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit four signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
  - 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  - 5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Contractor's construction schedule (preliminary if not final).
  - 4. Products list.
  - 5. Schedule of unit prices.
  - 6. Submittal schedule.
  - 7. List of Contractor's staff assignments.
  - 8. List of Contractor's principal consultants.
  - 9. Copies of building permits.
  - 10. Copies of authorizations and licenses from authorities having jurisdiction.
  - 11. Report of preconstruction conference.
  - 12. Certificates of insurance and insurance policies.
  - 13. Performance and Payment Bonds.
  - 14. Data needed to acquire Owner's insurance.
- K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting the claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

- 1. Evidence of completion of Project closeout requirements.
- 2. Insurance certificates for products and completed operations as required in proof that taxes, fees, and similar obligations were paid.
- 3. Updated final statement, accounting for final changes to the Contract Sum.
- 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
- 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
- 6. AIA Document G707, "Consent of Surety to Final Payment."
- 7. Evidence that claims have been settled.
- 8. Substantial Completion or when Owner assumes possession of and responsibility for corresponding elements of the Work.
- 9. Final liquidated damages settlement statement.
- 10. The building code required contractor certification.

END OF SECTION 01 29 00

# SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. Requests for Information (RFIs).
  - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
  - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

#### 1.3 DEFINITIONS

A. RFI: Request for Information, from Owner, Architect, or Contractor seeking clarifications of the Contract Documents.

### 1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1. Name, address, and telephone number of the entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including the superintendent and other personnel in attendance at the project site. Identify individuals and their duties and responsibilities, list addresses and telephone numbers and e-mail addresses. Always keep this list current.

# 1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, which depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on the installation of other components, before or after its installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors when appropriate and/or required, to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Project closeout activities.

# 1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings, at a scale not less than 1/4" = 1'-0", according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate the integration of products and materials fabricated or installed by more than one entity.
  - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for the preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe the relationship of various systems and components.
    - b. Indicate required installation sequences.

c. Indicate the dimensions shown on the Drawings. Specifically, note dimensions that appear to conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to the Architect indicating the proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

# 1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return RFIs submitted to the Architect by other entities controlled by the Contractor with no response.
  - 2. Coordinate and submit RFIs promptly to avoid delays in the Contractor's work or the work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of the item needing information or interpretation and the following:
  - 1. Project name, Project number, and Date.
  - 2. Name of Contractor.
  - 3. Name of Architect.
  - 4. RFI number, numbered sequentially.
  - 5. RFI subject.
  - 6. Specification Section number and title and related paragraphs, as appropriate.
  - 7. Drawing number and detail references, as appropriate.
  - 8. Field dimensions and conditions, as appropriate.
  - 9. Contractor's suggested resolution. If the Contractor's suggested resolution impacts the Contract Time or the Contract Sum, the Contractor shall state the impact in the RFI.
  - 10. Attachments: Include sketches, descriptions, measurements, photos, data, Shop Drawings other information necessary to fully describe items needing interpretation.
  - 11. Include dimensions, thicknesses, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Contractors standard AIA form or AIA Document G716, Software-generated form with substantially the same content as indicated above, acceptable to Architect.
  - 1. Attachments shall be electronic files in digital PDF format.
- D. Architect's Action: The Architect and Construction Manager will review each RFI, determine the action required, and respond. Allow seven working days for the Architect's response for each RFI. RFIs received by the Architect after 1:00 p.m. will be considered as received the following working day.
  - 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.

- 2. Architect's action may include a request for additional information, in which case the Architect's time for response will date from the time of receipt of additional information.
- 3. Architect's action on RFIs that may result in a change to the Contract Time, or the Contract Sum may be eligible for the Contractor to submit a Proposed Change Order (PCO) according to Division 01 Section "Contract Modification Procedures."
  - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 7 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.
  - 1. Project name.
  - 2. Name and address of Contractor.
  - 3. Name and address of Architect.
  - 4. RFI number including RFIs that were returned without action or withdrawn.
  - 5. RFI description.
  - 6. Date the RFI was submitted.
  - 7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven <7> days if Contractor disagrees with response.
  - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

# 1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of the date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  - 3. Minutes: OPM is responsible for conducting meetings and will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three <3> days of the meeting.
- B. Preconstruction Conference: OPM or Architect will schedule a preconstruction conference before starting construction, at a time convenient to Owner and GC, but no later than fourteen (14) days after execution of the Agreement.
  - 1. Conduct the conference to review responsibilities and personnel assignments.
  - 2. Attendees: Authorized representatives of the Owner, OPM, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
  - 3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.

- b. Sequencing and long-lead items.
- c. Lines of communication.
- d. Procedure for processing field decisions and Change Orders.
- e. Procedures for RFIs.
- f. Procedures for processing Applications for Payment.
- g. Submittal procedures.
- h. Use of the premises and/or and existing building.
- i. Work restrictions and Working hours.
- j. Owner's occupancy requirements.
- k. Responsibility for temporary facilities and controls.
- I. Procedures for moisture control.
- m. Procedures for disruptions and shutdowns.
- n. Construction waste management and recycling.
- o. Work, and storage areas.
- p. Equipment deliveries and priorities.
- q. Site Safety, First aid.
- r. Security.
- s. Progress cleaning.
- 4. Minutes: OPM is responsible for conducting meetings, record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at the Project site before each construction activity that requires coordination with other construction.
  - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with materials and installations that shall attend the meeting. Advise Architect and OPM of meeting dates.
  - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Submittals.
    - c. Time schedules.
    - d. Weather limitations.
    - e. Manufacturer's instructions.
    - f. Warranty requirements.
    - g. Temporary facilities and controls.
    - h. Regulations of authorities having jurisdiction.
    - i. Installation procedures.
    - j. Protection of adjacent work.
    - k. Protection of construction and personnel.
  - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  - 5. Do not proceed with installation if a conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
- 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
- 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
  - a. Preparation of record documents.
  - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
  - c. Submittal of written warranties.
  - d. Requirements for operations and maintenance data.
  - e. Requirements for/of material samples, attic stock, and spare parts.
  - f. Preparation of Contractor's punch list.
  - g. Procedures for Applications for Payment at Substantial Completion and for final payment.
  - h. Submittal procedures.
  - i. Responsibility for removing temporary facilities and controls.
- 4. Minutes: General Contractor conducting meeting will record and distribute meeting minutes.
- E. Progress Construction Meetings: Conduct progress meetings bi-weekly or established intervals.
  - 1. Coordinate dates of meetings with preparation of payment requests.
  - Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Revise "Agenda" Subparagraph below to suit Project.
  - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to project status.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Sequence of operations.
      - 2) Submittal Status.
      - 3) Temporary facilities and controls.
      - 4) Status of RFIs.
      - 5) Documentation of Payment requests.
      - 6) Status of Proposed Change Orders (PCO) or Change Orders (CO).
      - 7) Deliveries.
      - 8) Quality of work standards. Status of correction of deficient items.

- 4. Minutes: General Contractor responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
  - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

# 1.9 DAILY SIGN-IN SHEET

- A. General: Keep a daily sign-in sheet containing the following information within the project field office.
  - 1. Name
  - 2. Company Name
  - 3. Arrival/Departure time

# 1.10 COMPANY LISTINGS

A. General: Keep a list of all insured employees of the General Contractor and All Subcontractors within the project office. Non-employees shall not be permitted to the site.

END OF SECTION 01 31 00

# SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

# PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Construction schedule.
  - 2. Construction schedule updating reports.
  - 3. Daily construction reports.
  - 4. Material location reports.
  - 5. Site condition reports.
- B. Related Requirements:
  - 1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
  - 2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

# 1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by the Architect.
- C. Event: The starting or ending point of an activity.
- D. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

# 1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

- 1. Working electronic copy of schedule file, where indicated.
- 2. PDF electronic file.
- B. Startup construction schedule.
  - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.
- E. Daily Construction Reports: Submit at biweekly intervals.
- F. Material Location Reports: Submit at monthly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.

# 1.5 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
  - 1. Review submittal requirements and procedures.
  - 2. Review time required for review of submittals and resubmittals.
  - 3. Review requirements for tests and inspections by independent testing and inspecting agencies.
  - 4. Review time required for Project closeout
  - 5. Review and finalize list of construction activities to be included in the schedule.
  - 6. Review procedures for updating schedule.

# 1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, schedule, progress reports, payment requests.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.

# PART 2 - PRODUCTS

- 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL
  - A. Time Frame: Extend the schedule from date established for the Notice to Proceed to date of final completion.
    - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

- B. Activities:
  - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by the Architect.
  - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  - 4. Testing Time: Include no fewer than fifteen (15) days for testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's procedures necessary for certification of Substantial Completion.
  - 6. Punch List and Final Completion: Include not more than 20 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule.
  - 1. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.
    - f. Seasonal variations.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, to substantial Completion, and final completion.
  - 1. Temporary enclosure and site staging.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
  - 1. Unresolved issues.
  - 2. Unanswered RFI.
  - 3. Rejected or unreturned submittals.
  - 4. Notations on returned submittals.
  - 5. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is fourteen <14> or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- G. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
  - 1. List of subcontractors at Project site.
  - 2. Approximate count of personnel at Project site.

- 3. Equipment at Project site.
- 4. Material deliveries.
- 5. Temperatures and weather conditions, including the presence of rain or snow.
- 6. Injuries or Accidents.
- 7. Meetings and significant decisions.
- 8. Stoppages, delays, shortages, and losses.
- 9. Emergency procedures.
- 10. Orders/requests of authorities having jurisdiction.
- 11. Change Orders received and implemented.
- 12. Services connected and disconnected.
- 13. Partial completions and occupancies.
- 14. Substantial Completions authorized.
- H. Material Location Reports: prepare and submit a comprehensive list of materials delivered to and stored at the Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with the list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
  - 1. Material stored prior to previous report and remaining in storage.
  - 2. Material stored prior to previous report and since removed from storage and installed.
  - 3. Material stored following previous report and remaining in storage.
- I. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

# 2.2 SPECIAL REPORTS

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

# 2.3 RECORD DOCUMENTS

- A. Prior to the start of construction, the Architect shall deliver to the Contractor a complete set of "Issued for Construction" drawings, and a complete project manual, including addenda, for the purpose of maintaining record documents.
- B. Also, maintain a copy of all modifications and change orders.
- C. Maintain the documents in a safe, dry location during the entire construction process. The Contractor, together with his subcontractors, shall indicate clearly and accurately, any and all changes necessitated by field conditions. In addition, accurately maintain dimensions locating all pipes, ducts, etc. built into or under concrete slabs or masonry walls, including elevations, inverts, etc.

- D. With each monthly requisition, send certification, signed by the Contractor's Superintendent and Owner's Field Representative, that the documents are being maintained accurately and currently. At the completion of the Project, return the documents to the Architect, along with certification that the documents are complete in that they represent the true constructed conditions.
- E. Electronic Submission of Record Drawings in AutoCAD is mandatory in addition to hard copies.

# 2.4 ELECTRONIC FILES

- A. The Robinson Green Beretta Corporation shall make electronic drawing files available to the successful Contractor for the cost of \$500 non-refundable, for the purpose of preparing submittals, record drawings, etc in accordance with the following policy:
  - 1. Drawings shall be digitally transferred by flash drive or ShareFile link mailed.
  - 2. Requester must sign an Electronic File Transmittal Form.
  - 3. Copies of documents files in electronic media format, data, graphic or other furnished by the Architect to the Contractor are only for the convenience of the Contractor. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. When transferring documents in electronic media format, the Architect make no representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems or computer hardware differing from those in use by the Architect at the beginning of this project.

# PART 3 - EXECUTION

# 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

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

END OF SECTION

# SECTION 01 33 00 - SUBMITTAL PROCEDURES

# PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
  - 3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including the Contractor's construction schedule.
  - 4. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
  - 5. Division 01 Section "Closeout Procedures" for submitting warranties.
  - 6. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 7. Division 02 through 32 Sections for specific requirements for submittals in those Sections.

### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables the transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users can access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

# 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  - 4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's final release or approval.
    - g. Scheduled date of fabrication.
- B. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
  - 1. Architect will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - **b.** Contractor shall execute a data release agreement with RGB prior to receipt of digital files.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

- a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 1. Initial Review: Allow fifteen <15> days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow fifteen <15> > days for review of each resubmittal.
  - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow fifteen <15> days for initial review of each submittal.
  - 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow twenty (20) days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
  - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  - 2. Name file with submittal number or other unique identifier, including revision identifier.
    - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
  - 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
  - 4. Transmittal Form for Electronic Submittals: Use PDF format acceptable to Owner, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Names of the subcontractor, manufacturer, and supplier.
    - h. Category and type of submittal.
    - i. Submittal purpose and description.
    - j. Specification Section number and title.
    - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
    - I. Drawing number and detail references, as appropriate.
    - m. Location(s) where product is to be installed, as appropriate.
    - n. Related physical samples submitted directly.

- o. Indication of full or partial submittal.
- p. Transmittal number.
- q. Submittal and transmittal distribution record.
- r. Other necessary identification.
- s. Remarks.
- 5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
  - a. Project name.
  - b. Number and title of appropriate Specification Section.
  - c. Manufacturer name.
  - d. Product name.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include the same identification information as related submittal.
- H. Resubmittals: Make resubmittals in the same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

# PART 2 - PRODUCTS

# 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  - 1. Post electronic submittals as PDF electronic files directly to Project Web site specifically established for Project or via digital file sharing system.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  - 2. Submit electronic submittals via email as PDF electronic files.

- a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
- 3. Certificates and Certifications Submittals: Provide a statement that includes the signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
  - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard published data is not suitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  - 4. Submit Product Data before or concurrent with Samples.
  - 5. Submit Product Data in the following format:
    - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
  - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
  - 3. Submit Shop Drawings in the following format:
    - a. PDF electronic file.

- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
  - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  - 2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  - 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  - 4. Disposition: Maintain sets of approved Samples at Project site, available for qualitycontrol comparisons throughout the course of construction activity. Sample sets may be used to determine the final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit one (1) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  - 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
    - a. Number of Samples: Submit three (3) Samples. Architect will retain one (1) Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.
  - 7. <u>ALL</u> product samples will be submitted to the Architect a minimum of 3 weeks prior to the date that the first required material submittal return to allow for proper selection of materials and colors.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Type of product. Include a unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  - 2. Manufacturer and product name, and model number if applicable.
  - 3. Number and name of room or space.
  - 4. Location within room or space.
  - 5. Submit product schedule in the following format:
    - a. PDF electronic file.
- F. Coordination Drawing Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other specified information.
- J. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- K. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- L. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- M. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- N. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- O. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- P. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.

- 3. Time period when report is in effect.
- 4. Product and manufacturers' names.
- 5. Description of product.
- 6. Test procedures and results.
- 7. Limitations of use.
- Q. Compatibility Test Reports: Submit reports written by a qualified testing agency, on the testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- R. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

# PART 3 - EXECUTION

## 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

# 3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. The architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00

## SECTION 01 40 00 - QUALITY REQUIREMENTS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other qualityassurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, Commissioning Authority and/or Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

# 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect and/or Construction Manager.
- C. Product Testing: Tests and inspections that are performed by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

- F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. The use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

# 1.4 CONFLICTING REQUIREMENTS

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

## 1.5 ACTION SUBMITTALS

- 1. Indicate manufacturer and model number of individual components.
- 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
  - 1. Main wind-force-resisting system or a wind-resisting component listed in the wind-forceresisting system quality-assurance plan prepared by Architect.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

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

#### 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for the Project.
  - 1. Project quality-control manager may also serve as Project superintendent for small or limited projects.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: GC include a schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

# 1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.

- 3. Name, address, and telephone number of testing agency.
- 4. Dates and locations of samples and tests or inspections.
- 5. Names of individuals performing tests and inspections.
- 6. Description of the Work and test and inspection method.
- 7. Identification of product and Specification Section.
- 8. Complete test or inspection data.
- 9. Test and inspection results and an interpretation of test results.
- 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
- 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
- 12. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
  - 1. Name, address, and telephone number of technical representative making report.
  - 2. Statement on condition of substrates and their acceptability for installation of product.
  - 3. Statement that products at Project site comply with requirements.
  - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  - 6. Statement whether conditions, products, and installation will affect warranty.
  - 7. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

#### 1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce the required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce the required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

- 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
- 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- F. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
  - 1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

# 1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Where services are indicated as the Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  - 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  - 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  - 5. Testing and inspecting requested by the Contractor and not required by the Contract Documents are Contractor's responsibility.
  - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they are so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

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

# 1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency and/or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and in Statement of Special Inspections attached to this Section, and as follows:
  - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
  - 2. Notifying Architect, Commissioning Authority, , Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect and Commissioning Authority, and Construction Manager, with copy to Contractor and to authorities having jurisdiction.
  - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  - 6. Retesting and reinspecting corrected work.

# PART 2 - EXECUTION

## 2.1 ACCEPTABLE TESTING AGENCIES

- A. Firms acceptable to perform designated tests and inspections are:
  - 1. Briggs Engineering & Testing, 100 Weymouth Street, Rockland, MA 02370
  - 2. Other firms as approved by architect

# 2.2 TEST AND INSPECTION LOG

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

# 2.3 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 or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are the Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

# SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support and security facilities.
- B. Related Requirements:
  - 1. Division 01 Section "Summary of Work" for work restrictions and limitations on utility interruptions.

#### 1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's agent/representative, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Where water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas. Note parking areas for construction personnel will be available on the site. Contingent on Owners preference and designation.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

- 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
- 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
- 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

# 1.5 QUALITY ASSURANCE

- A. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- B. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

## 1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

#### 1.7 DRINKING WATER AND SERVICE

- A. Provide potable water in convenient and accessible locations for construction personnel.
- B. Provide all piping, fittings, valves, or connections, necessary for furnishing water during the construction period.
- C. Contractor to Pay costs of potable water and temporary services.

#### 1.8 TEMPORARY FIRE PROTECTION

- A. Provide general, temporary fire protection requirements.
- B. Permanent fire protection equipment, used for fire protection during construction, shall be the responsibility of the Installer.

# 1.9 WEATHER PROTECTION AND TEMPORARY HEAT/VENTILATION

- A. Refer throughout these specifications for the type, duration and level of requirements for heating/ventilating and weather protection.
- 1.10 STORAGE

- A. Coordinate the use and location of storage areas for various trades and subcontractors.
- B. Storage areas shall be approved by the Owner/Architect.
- C. Storage areas shall be always maintained in a clean condition.

## 1.11 SPECIAL CONTROLS

A. Maintain premises and property free from accumulations of waste, debris, and rubbish caused by operations.

## B. Hazards Control:

- 1. Store volatile waste in covered metal containers and remove them from the premises daily.
- 2. Prevent accumulation of waste and debris creating hazardous conditions.
- 3. Provide adequate ventilation during use of volatile or noxious substances.
- 4. Conduct cleaning and disposal operations to comply with local ordinances and antipollution laws.
- 5. Do not burn or bury rubbish and waste materials on the project site.
- 6. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner into the storm or sanitary drains.
- 7. Do not dispose of waste into streams or waterways.
- 8. Remove snow and ice from access to buildings.
- 9. Maintain cleaning until project, or portion thereof, is occupied by the Owner.

## 1.12 OTHER TEMPORARY FACILITIES AND CONTROLS

- A. Project Sign:
  - 1. Provide a temporary project sign, conforming to Architect's Sketch, with lettering as approved, and by a professional sign provider.
  - 2. Project Sign: Provide one (1), as follows.
    - a. Construction fence banner.
    - b. Size: 4 x 8 feet.
    - c. Material: Vinyl.
    - d. Provide the following minimum information on sign:
      - 1) Project name.
      - 2) Owner's name.
      - 3) Architect's name.
      - 4) Contractor's name.
  - 3. Project sign: Architect to provide sketch.
  - 4. No other signs or advertisements will be allowed to be displayed without the written approval of the Owner.
  - 5. Locate where directed.
    - a. Do not post other signs, unless approved by the Architect and Owner, within the Project or Contract Limit Line.

- B. Protection of Work-In-Place:
  - 1. Thoroughly protect all completed work and stored materials.
  - 2. Provide boards, cloths, planks, waterproof paper, canvas or other means of protection and use as required to prevent damage.
  - 3. Replace or rectify work or materials damaged by workmen, by the elements or by any other cause, to the satisfaction of the Architect and at no additional expense to the Owner.
  - 4. Do not allow workmen, including those of any sub-contractor or supplier, to mark finish surfaces with marking pens or other such devices which are not readily erasable.

# PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide cast concrete bases for support of fence posts.

# 2.2 TEMPORARY FACILITIES

A. Storage and Fabrication Sheds: Provide shed or container sized and equipped to accommodate materials and equipment for construction operations.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure filter system to run continuously.

## PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

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

### 3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for the use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of these fixtures.
- C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas, to the greatest extent possible.
  - 1. Prior to commencing work, isolate any system in work areas to be performed according to drawings.
  - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dustproducing equipment. Isolate limited work within occupied areas using portable dustcontainment devices.
  - 3. Perform daily construction cleanup using approved, HEPA-filter-equipped vacuum equipment.
- D. Ventilation and Humidity Control: Provide temporary protection of construction activities requiring curing or drying of completed installations of construction from adverse effects of high humidity. Select components and equipment that will not have a harmful effect on completed installations or elements being installed. Insert gas or other utility services if required for the Project.
- E. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
  - 1. Connect temporary service to Owner's existing power source, as directed by Owner.

## 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
  - 1. Provide storage sheds located within construction areas or within 30 feet of building lines that are noncombustible according to ASTM E 136. Comply with NFPA 241.
  - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Permanent Roads and Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for city fire-fighting equipment and access to fire hydrants.

- C. Parking: Due to Urban conditions, there are limited parking areas for construction personnel on the site. Construction workers will have to coordinate and may have to park on the city streets adjacent to the construction site.
- D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
  - 2. Temporary Signs: Provide other signs as indicated and as required to inform the public and individuals seeking entrance to the Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
  - 3. Maintain and touchup signs so they are always legible.
- E. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."
- G. Temporary Stairs: Provide temporary staging and scaffold stairs where ladders are not adequate.
- H. Temporary Use of Permanent Stairs: Use of existing stairs must be protected from damage and degradation during construction. All existing finishes will be restored to new condition by the contractor at time of Substantial Completion.

## 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair any and all damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - 1. Inspect, repair, and maintain erosion and sedimentation control measures during construction.
  - 2. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during construction of the Project.
  - 3. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

- D. Site Enclosure Fence: Before construction operations begin and prior to commencing work, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering the site except by appropriate entrance gates.
  - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  - 2. Maintain security by limiting the number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner when required by Owner.
- E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- H. Temporary Fire Protection:
  - 1. Smoking is prohibited in construction areas.

# 3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
  - 1. Protect porous materials from water damage.
  - 2. Protect stored and installed material from flowing or standing water.
  - 3. Keep porous and organic materials from coming into prolonged contact with concrete.

## 3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when the need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

- 1. Materials and facilities that constitute temporary facilities are property of Contractor. The Owner reserves the right to take possession of Project identification signs.
- 2. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
- 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 50 00

## SECTION 01 60 00 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project.

#### 1.3 DEFINITIONS

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

#### 1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit a request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request.

Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

## 1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

#### C. Storage:

- 1. Store products to allow for inspection and measurement of quantity or counting of units.
- 2. Store materials in a manner that will not endanger Project structure.
- 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 4. Protect foam plastic from exposure to sunlight, except to the extent necessary for period of installation and concealment.
- 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 6. Protect stored products from damage and liquids from freezing.
- 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  - 3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

# PART 2 - PRODUCTS

## 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
  - 1. Provide products complete with accessories, trim, finish, fasteners, and other appurtenances needed for complete installation and indicated use.
  - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  - 4. Where products are accompanied by the term "as selected," Architect will make selection.
  - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

## 2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: The Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied,

the Architect may return requests without action, except to record noncompliance with these requirements:

- 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
- 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, durability, and specific features and requirements indicated.
- 3. Evidence that proposed product provides specified warranty.
- 4. List of similar installations for completed projects with project names and addresses.
- 5. Samples, if requested.

END OF SECTION 01 60 00

SECTION 01 71 00 - CLEANING

PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Protect absorptive materials from moisture damage and replace filtration media prior to occupancy. If permanently installed air handlers are used during construction, filtration media having a minimum MERV of 8 per ASHRAE 52.2-1999 standards shall be installed at all return air grilles. All filtration media shall be replaced immediately prior to occupancy.

#### 1.2 SUBMITTALS

A. The contractor will be required to submit a During Construction Air Quality Management Plan conforming to SMACNA IAQ Guidelines to be followed for the duration of construction activities. The contractor will also be required to submit cut sheets of temporary filtration media highlighting MERV value indicated, as well as photographs taken during construction of IAQ measures in place, such as protection of ducts and, protection of absorptive materials from moisture damage to the architect at the end of the project.

#### 1.3 REQUIREMENTS INCLUDED

A. Execute cleaning, during the progress of the work, and at completion of the work, as required by General Conditions.

## 1.4 RELATED REQUIREMENTS

- A. Conditions of the contract.
- B. Each Specification Section: Cleaning for specific products or work.
- 1.5 DISPOSAL REQUIREMENTS
  - A. Conduct cleaning and disposal operations to comply with all State, local codes, ordinances, regulations and anti-pollution laws.

## PART 2 - PRODUCTS

## 2.1 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage existing or new surfaces.

- B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning product/material manufacturer.

## PART 3 - EXECUTION

#### 3.1 DURING CONSTRUCTION

- A. Execute periodic cleaning, not less than weekly, to keep the work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish per Section 015000.
- C. Remove waste materials, debris and rubbish from the site periodically, and dispose of material at legal disposal areas away from the site.

# 3.2 DUST CONTROL

A. Clean interior spaces that have been exposed to dust/debris due to construction activities and continue cleaning on an as-needed basis until the project is finished.

## 3.3 PROGRESSIVE CLEANING

A. Cleaning during construction is the responsibility of the Contractor. All areas shall be cleaned in a manner acceptable to the Owner's Representative. One cleaning personnel with appropriate tools shall be provided at initiation of construction to project completion. The primary function of this individual shall be cleaning the Facility in a manner acceptable to the owner or owner's representative.

## 3.4 FINAL CLEANING

- A. Final cleaning before final inspection. Interior and exterior areas of the building shall be cleared of all rubbish and debris and thoroughly cleaned by the Contractor, including the following:
  - 1. All construction facilities, debris, and rubbish shall be removed from the Owner's property and disposed of legally.
  - 2. All surfaces exposed to construction activity, directly or indirectly, shall be swept, dusted, washed, or polished.

# 3.5 OTHER CLEANING

A. Broom clean exterior paved surfaces, rake clean other surfaces of the site and grounds disturbed by construction.

- B. All work areas shall have the ground surface "swept" with the use of a high-power magnet to clear dropped or loose screws, nails or other attachment materials.
- C. Prior to final completion, the Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.

END OF SECTION 017100

# SECTION 01 73 00 - EXECUTION

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Installation of the Work.
  - 3. Cutting and patching.
  - 4. Protection of installed construction.
  - 5. Correction of the Work.

#### 1.3 DEFINITIONS

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

## 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For certified land surveyor or professional engineer.
- B. Cutting and Patching Plan: Submit a plan describing procedures at least ten (10) days prior to the time cutting and patching will be performed. Include the following information:
  - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
  - 4. Dates: Indicate when cutting and patching will be performed.

# 1.5 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

- 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
- 2. Operational or Construction Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
  - a. Tele-Data Control systems.
  - b. Fire-detection and alarm systems.
  - c. Electrical wiring systems.
  - d. Equipment supports.
  - e. Piping, ductwork, and equipment.
- B. Cutting and Patching Conference: Before proceeding, meet at the Project site with parties involved in cutting and patching, including electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match the in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in place materials.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine electrical systems to verify actual locations of connections before equipment or fixture installation.
  - 2. Examine walls in suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to Division 01 Section "Project Management and Coordination."

# 3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations.
- D. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Coordinate installation of anchorages. Furnish directions for installing anchorages, including inserts, anchor bolts, and items with integral anchors, that are to be embedded in masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, bypass such services/systems before cutting to prevent interruption to occupied areas.
- E. Cutting: Cut in-place construction by sawing, drilling, chipping, grinding, and similar operations, using methods least likely to damage elements retained or adjoining construction.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Proceed with patching after construction operations requiring cutting are complete.
- F. Patching: Patch construction by filling, repairing, refinishing, similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean iron, and similar features before applying paint or other finishing materials.
  - 3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

#### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
  - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  - 2. Do not hold waste materials for more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  - 4. Coordinate progress cleaning for joint-use areas where Contractor and other subcontractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 3.6 PROTECTION OF INSTALLED CONSTRUCTION

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

END OF SECTION 017300

# SECTION 01 74 20 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

## 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 the following:
  - 1. Salvaging nonhazardous construction waste.
  - 2. Recycling nonhazardous construction waste.
  - 3. Disposing of nonhazardous construction waste.
- B. Related Requirements:
  - 1. Division 31 Earthwork for Small Projects
  - 2. Drawing Sheets C1 and C2

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in the facility.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether the organization is tax exempt.
- B. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

C. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

## 1.5 WASTE MANAGEMENT PLAN

- A. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for demolition waste. Include estimated quantities and assumptions for estimates.
  - 1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including designated location where materials separation will be performed.

# 1.6 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: Use only available recycling receivers and processors licensed to do business in the local area.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include a list of acceptable and unacceptable materials at each container and bin.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

## 1.7 RECYCLING DEMOLITION WASTE

- A. Metals: Separate metals by type.
  - 1. Flashing: Stack according to size, type, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

## 1.8 RECYCLING CONSTRUCTION WASTE

## A. Packaging:

- 1. Cardboard Boxes: Break down packaging into flat sheets. Store in a dry location.
- 2. Polystyrene Packaging: Separate and bag materials.
- 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
- 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
  - 1. Clean Cut-Offs of Lumber and Clean Sawdust: Bag sawdust that does not contain painted wood.

## 1.9 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste from Project site and legally dispose of them as acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials. No burning of any kind allowed on site.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them. All building material debris associated with this project to be disposed of at a properly licensed and permitted disposal facility, Contractor to keep documentation and have available for review by Owner and Architect.

END OF SECTION 01 74 19

# SECTION 01 78 30 - PROJECT RECORD DOCUMENTS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.

#### B. Related Requirements:

- 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
- 2. Division 01 Section "Closeout Procedures" for operation and maintenance manual requirements.
- 3. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

## 1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit PDF electronic files of scanned record prints.
      - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit PDF electronic files of scanned record prints and one set(s) of prints.
      - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
  - 1. Where record Product Data is required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous recordkeeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

# PART 2 - PRODUCTS

## 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding archive photographic documentation.
  - 2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Changes made by Change Order or Construction Change Directive.
    - d. Details not on the original Contract Drawings.
    - e. Field records for variable and concealed conditions.
    - f. Record information on the Work that is shown only schematically.
  - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  - 6. Note Construction alternate numbers, Change Order numbers or similar identification, as applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
  - 1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.

- 2. Format: Annotated PDF electronic file.
- 3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
- 4. Refer instances of uncertainty to Architect for resolution.
- 5. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
  - a. See Division 01 Section "Submittal Procedures" for requirements related to use of Architect's digital data files.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
  - 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
  - 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation in relation to other construction.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
  - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Format: Annotated PDF electronic file.
  - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  - 4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

# 2.2 RECORD SPECIFICATIONS

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

### 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Provide information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to the Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
  - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

# PART 3 - EXECUTION

### 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in site office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 30

# SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

#### 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, and other pozzolans that do not retard short term strength of concrete; ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.
- B. Fly-Ash: Fly-ash is not allowed for this project.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer, testing agency.
- B. Welding certificates.

- C. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Form materials and form-release agents.
  - 4. Steel reinforcement and accessories.
  - 5. Fiber reinforcement.
  - 6. Curing compounds.
  - 7. Adhesives.
- D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- F. Field quality-control test and inspection reports.
- G. Minutes of preinstallation conference.

### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as ACIcertified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for 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.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician -Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code Reinforcing Steel."

- F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.]
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, manufacturers specified.

### 2.2 FORM-FACING MATERIALS

- A. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), 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.

#### 2.3 STEEL REINFORCEMENT

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

## 2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

### 2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I/II. Supplement with the following:
    - a. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
  - 1. Maximum Coarse-Aggregate Size: 3/4-inch (19 mm) nominal.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.

### 2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 4. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 5. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
  - 6. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include:
    - a. Euclid Chemical Company (The), an RPM company; EUCON CIA.

- b. Grace Construction Products, W. R. Grace & Co.; DCI.
- c. Sika Corporation; Sika CNI.
- d. Master Builders, Inc., Rheocrete, CNI
- e. Boral Material Technologies, Boral BCN
- C. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-setaccelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include:
    - a. BASF Construction Chemicals Building Systems; Rheocrete 222+.
    - b. Cortec Corporation; MCI- 2000 and/or 2005NS.
    - c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
    - d. Sika Corporation; FerroGard 901.
    - e. Axim Concrete Technologies, Gatexol 1000Cl
    - f. Boral Material Technologies, Inc., Boral BCN2

### 2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, the following:
    - a. Axim Italcementi Group, Inc.; CATEXOL CimFilm.
    - b. BASF Construction Chemicals Building Systems; Confilm.
    - c. ChemMasters; SprayFilm.
    - d. Conspec by Dayton Superior; Aquafilm.
    - e. Dayton Superior Corporation; Sure Film (J-74).
    - f. Edoco by Dayton Superior; BurkeFilm.
    - g. Euclid Chemical Company (The), an RPM company; Eucobar.
    - h. Kaufman Products, Inc.; Vapor-Aid.
    - i. Lambert Corporation; LAMBCO Skin.
    - j. L&M Construction Chemicals, Inc.; E-CON.
    - k. Meadows, W. R., Inc.; EVAPRE.
    - I. Metalcrete Industries; Waterhold.
    - m. Nox-Crete Products Group; MONOFILM.
    - n. Sika Corporation; SikaFilm.
    - o. SpecChem, LLC; Spec Film.
    - p. Symons by Dayton Superior; Finishing Aid.
    - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
    - r. Unitex; PRO-FILM.
    - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

1. VOC Content: Curing and sealing compounds shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

#### 2.8 RELATED MATERIALS

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

#### 2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301. Contractor shall also conform to all material provisions set forth in the Rhode Island Department of Transportation (RIDOT) for roads and bridge construction 2004 Edition with all revisions.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  - 1. Ground Granulated Blast-Furnace Slag: 40 percent.
  - 2. Combined Pozzolan and Ground Granulated Blast-Furnace Slag: 40 percent portland cement minimum, with pozzolan not exceeding 25 percent.
  - 3. Silica Fume: 10 percent.
  - 4. Combined Pozzolans, and Silica Fume: 35 percent with pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
  - 5. Combine Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

### 2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength: 3000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.50.

- 3. Slump Limit: 4 inches (100 mm) for concrete with verified slump of 2 to 4 inches (50 to 100 mm) before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch (25 mm).
- 4. Air Content: 6 percent, plus or minus 1.0 percent at point of delivery for 3/4-inch (19-mm) nominal maximum aggregate size.

## 2.11 FABRICATING REINFORCEMENT

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

### 2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M and furnish batch ticket information.
  - 1. When the air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
  - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
  - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

# PART 3 - EXECUTION

### 3.1 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 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 347 as abrupt or gradual, as follows:
  - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
  - 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- 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.
- F. Chamfer (unless specifically noted on drawings "do not chamfer"), exterior corners and edges of permanently exposed concrete.
- G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- H. 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 rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurate position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
  - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

## 3.4 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 unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

- D. Deposit concrete continuously in one layer or in horizontal 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 indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) 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 mixture constituents to segregate.
- E. 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 average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 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 mixture designs.
- F. Hot-Weather Placement: Comply with ACI 301 and as follows:
  - 1. Maintain concrete temperature below 90 deg F (32 deg C) 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

## 3.5 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with inplace construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

# 3.6 CONCRETE PROTECTING 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 ACI 301 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 (1 kg/sq. m 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 for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, 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 (300-mm) 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 (300 mm), 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.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor and/or traffic covering used on Project.
  - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat the process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.7 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one-part Portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  - Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). 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.
- D. 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 (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  - 2. After concrete has cured for at least 14 days, correct high areas by grinding.
  - 3. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing them with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  - 4. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove the 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.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a special inspector, and Contractor will engage qualified testing and inspecting agency unless noted otherwise to perform field tests and inspections and prepare test reports.
- B. Testing and Inspecting: Engage a qualified testing and inspecting agency subject to approval by Architect and/or Owner to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Steel reinforcement placement.
  - 2. Verification of use of required design mixture.
  - 3. Concrete placement, including conveying and depositing.
  - 4. Curing procedures and maintenance of curing temperature.
- D. Concrete Tests: 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 mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
  - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, 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 mixture.
  - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) 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 mixture.
  - 6. Compression Test Specimens: ASTM C 31/C 31M.
    - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
  - 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
    - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  - 8. When strength of field-cured cylinders is less than 85 percent of companion laboratorycured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

- 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- 10. 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 mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- 11. 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.
- 12. 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/C 42M or by other methods as directed by Architect.
- 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 03 30 00

# SECTION 04 01 20 - MASONRY RESTORATION

### PART 1 - GENERAL

### 1.1 DESCRIPTION OF THE WORK:

- A. The work includes, but is not limited to:
  - 1. Repair and repointing of damaged areas, repair of indicated cracks, and stonework.
  - 2. Selected demolition of exterior brick work and the reconstruction, to match the existing work.
- B. Cleaning areas of new masonry and mortar installation.
- 1.2 RELATED WORK SPECIFIED ELSEWHERE:
  - A. Painting Section 09 91 00

#### 1.3 REFERENCE

- A. The following guidelines apply to re-pointing, cleaning or repair of masonry on historic buildings:
  - 1. "Preservation Briefs: 1. The Cleaning and Waterproof Coating of Masonry Buildings," U.S. Department of the Interior, National Technical Preservation Services 2000
  - 2. "Preservation Briefs: 2. Repointing Mortar Joints in Historic Brick Buildings," U.S. Department of the Interior, National Technical Preservation Services 1998

#### 1.4 QUALITY ASSURANCE:

- A. Job Mock-Up (Sample Wall Panel):
- B. Prior to initiation of masonry work, provide a sample panel mock-up using materials, bond and joint tooling shown or specified for final work. Provide special features as directed for caulking and contiguous work. Provide mock-up, where directed, approximately 4' x 4', indicating the proposed range of color, texture and workmanship to be expected in the completed work. Obtain acceptance of visual qualities of the mock-up before start of masonry work. Additional panels may be required until such approval is granted. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until work is completed. Provide mock-up panel for the following:
  - 1. Typical repointed exterior face brick wall.
- C. Contractor Responsibility:
- D. Plan and manage a program for controlling the quality of materials and workmanship to ensure that the work conforms to the Contract Documents. As a minimum, this program shall consist of selection of suitable material sources, supervision of the construction process, performance of the specified testing and certification of conformance with the Contract Documents.

## 1.5 SUBMITTALS:

- A. Manufacturer's Data:
  - 1. Submit the manufacturer's specifications and other data for each type of masonry unit and accessory required including certification that each type complies with the specified requirements. Include instructions for handling, storage, installation and protection of each. Transmit a copy of each instruction to the Installer.
  - 2. Submit certification of mortar proportions for repointing.
  - 3. Submit sieve analysis of pointing aggregates.
- B. Samples:
  - 1. Submit samples of all materials for approval.
  - 2. Submit samples of each type of exposed brick required. Submit pre-mixed mortar color samples, if specified. Include in each set the full range of exposed color and texture to be expected in the completed work. Architect's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

## 1.6 JOB CONDITIONS:

- A. Protection of Work: During erection, cover top of wall with heavy waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.
- B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Staining: Prevent grout or mortar from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- D. Protect all sills, ledges and projections from droppings of mortar.
- E. Protect newly pointed joints from rain, until pointed joints are sufficiently hard to not be damaged.

### PART 2 - PRODUCTS

### 2.1 MATERIALS:

- A. Masonry Units:
  - 1. Manufacturer: Obtain masonry units from one manufacturer of uniform texture and color for each kind required, for each continuous area and visually related areas.
- B. Brick:
  - 1. Manufacturer: Stiles and Hart (Basis of Design)
  - 2. Color: Match Existing
  - 3. Salvage existing units for re-use where indicated.
- C. Size: To match size, shape, dimension, including the distortion of existing units.

- D. Finish: Exposed face shall match color, texture and form of the existing brick. Surface irregularities shall be as prevalent as the average brick in a given 10' x 10' square.
- E. Building (Common) Brick:
  - 1. Quality Standard: ASTM C 62.
  - 2. Grade SW for exterior exposures or where in contact with earth. Grade SW may be used in lieu of MW or NW, and Grade MW in lieu of NW. Brick may be "frogged" but not cored.
    - a. Color and Texture: Selected from manufacturer's colors and textures to match existing.

### F. Mortar:

- 1. Mortar Components:
  - a. Sand for repointing: Provide sand conforming to ASTM C 144 to assure proper gradation and freedom from impurities; some variation may be necessary to match the original size and gradation. Sand color and texture also should match the original as closely as possible to provide the proper color match without other additives.
  - b. Lime for repointing: Provide lime conforming to ASTM C 207, Type S, or Type SA, Hydrated Lime for Masonry Purposes. Provide lime is designed to assure high plasticity and water retention.
  - c. Cement for repointing: Provide Portland cement conforming to ASTM C 150. Provide white or gray non-staining Portland cement as required to provide color match for mortars. The cement should not have more than 0.60 per cent alkali to help avoid efflorescence.
  - d. Water: Provide water free from acids, alkalis, or other dissolved organic materials.
- G. Materials:
  - 1. The Contractor shall analyze the existing mortar, in the area where work is being performed, and install mortar which matches existing in color and physical properties
  - 2. Due to the age of the buildings, there may be more than one type of mortar installed.
  - 3. The mortar for brickwork construction and repointing shall be mortar in accordance with ASTM C 270 and shall conform to the tested proportions.
    - a. Where colored mortar is present, provide color to match existing.
  - 4. Strength: Each class or mixture of mortar shall have a 28-day compressive strength matching the compressive strength of the original existing mortar in the structure as determined by ASTM C 109/C 109M for mortar. Test specimens of existing mortars shall be taken from a sound and intact representative portion of the structure.
  - 5. Special Properties: Mortar may contain admixtures, such as pigments, to match the characteristics of the original mortar. Use of all admixtures shall be subject to approval.
  - 6. Cementitious Content of Mortar: Each class or mixture of mortar shall have a cement content matching the cement content of the original existing mortar in order to provide uniform strength, weathering characteristics, and appearance of repaired surfaces in relation to existing surfaces.
- 2.2 CHEMICAL WASH: (At new and existing areas of brick and mortar)
  - A. Basis of Design: Prosoco Sure Klean 600 mnd80.

- 1. Provide 4' x 4' test patch using gentlest method possible, allow to stand for seven days prior to review and approval by the Architect.
- B. Basis of Design: Prosoco Vana Trol
  - 1. Provide 4' x 4' test patch using gentlest method possible, allow to stand for seven days prior to review and approval by the Architect.

### 2.3 MASONRY ACCESSORIES:

- A. Provide straps, bars, bolts and rods fabricated from not less than 16-gauge sheet metal or 3/8" diameter rod stock.
  - 1. Flexible Anchors: Where masonry is to be anchored to structural framework with flexible anchors, provide 2-piece anchors which will permit horizontal and vertical movement of masonry but will provide lateral restraint.
  - 2. Masonry Veneer Anchors to existing Masonry Construction: Corrugated stainless-steel ties not less than 16 gauge and not less than 1-1/4" wide and 7" long, with one end crimped for attachment to substrate with 5/16" diameter hole. Size to extend to within 3/4" of face of masonry veneer. Equal to Heckmann #187 Brick Veneer Anchor.
- B. Provide concealed flashings, shown to be built into masonry. Provide "metal", and "fabric" where specifically indicated; and as follows:
  - 1. Metal: 20-ounce, copper.
  - 2. Fabricate through-wall metal flashings with deformations in both directions for integral mechanical mortar bond.
  - 3. Fabric: Afco Copper Fabric, Wasco "Copper-Fabric" or Phoenix Type "FCC"; 3-ounce copper bonded on sides and edges to asphalt saturated cotton fabric with asphalt mastic.
- C. Miscellaneous Masonry Accessories
  - 1. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 of the sizes shown.
  - 2. Pins: Stainless steel pins of the sizes indicated.
- D. Lintels: Provide galvanized steel lintels, sizes as detailed or to match existing dimensions and gauge.

# PART 3 - EXECUTION

## 3.1 INSPECTION:

1. Examine the areas and conditions under which masonry is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

# 3.2 INSTALLATION:

A. REPAIR AND REPOINTING:

- 1. Remove loose mortar and repoint brick joints as required to ensure weathertight installation. Provide materials to match color and texture of existing mortar. Take care to cut out any joints with hairline cracks and repoint.
- 2. Immediately prior to the application of mortar, dampen joints to be tuck pointed. Prior to application of pointing mortar, allow masonry units to absorb surface water.
- 3. Tightly pack mortar into joints in thin layers, approximately 1/4-inch-thick maximum.
- 4. Allow layer to become "thumbprint hard" before applying next layer.
- 5. Pack final layer flush with surfaces of masonry units. When the mortar becomes "thumbprint hard", tool joints.
- 6. Joint Preparation.
  - a. Remove old mortar to a minimum depth of 2 to 2-1/2 times the width of the joint to ensure an adequate bond and to prevent mortar "popouts." For most brick joints, remove the mortar to a depth of approximately 1/2 to 1 inch; for stone masonry with wide joints, remove mortar to a depth of several inches. Remove loose or disintegrated mortar beyond these minimum depths.
  - b. Careful joint preparation can help limit damage to masonry units.
  - c. At head joints, remove old mortar using hand chisels and mash hammer.
  - d. The use of power saws or grinders shall be permitted at horizontal joints only.
  - e. Thin diamond-bladed grinders may be used to cut out *horizontal* joints only on hard Portland cement mortar. Where horizontal joints are uniform and fairly wide, use a power masonry saw to remove mortar by cutting along the middle of the joint, and removing the mortar from the sides of the joints using a hand chisel and hammer.
    - 1) Prepare test areas, to demonstrate proficiency with power tools prior to commencing full scale operations. If the use of power tools is permitted, the contractor should establish a quality control program to account for worker fatigue and similar variables.
- 7. Remove mortar cleanly from the masonry units, leaving square corners at the back of the cut. Before filling, rinse the joints with a jet of water to remove all loose particles and dust. At the time of filling, the joints should be damp, but with no standing water present. For masonry walls and common brick that are extremely absorbent, continually mist surfaces with water for a few hours before repointing operation begins.

## 3.3 RECONSTRUCTION:

- A. Thickness: Build masonry construction to the full thickness shown, except, build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness shown or specified.
- B. Cut units with motor-driven saw designed to cut masonry with clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting them wherever possible.
- C. Wet clay brick having ASTM C 67 absorption rates greater than 0.025 oz. per sq. in. per minute.
- D. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents.
  - 1. Do not use calcium chloride in mortar or grout.
- E. Pattern Bond: Lay exposed masonry in a matching bond pattern. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners, unless otherwise shown.

- 1. Match coursing, bonding, color and texture of new masonry work with existing work.
- F. Layout walls in advance for accurate spacing of surface bond patterns, with uniform joint widths and to properly locate openings, movement-type joints, returns and offsets. Avoid the use of less than half-size units at corners, jambs, and wherever possible at other locations.
- G. Lay-Up walls plumb and true and with courses level, accurately spaced and coordinated with other work.
- H. Stopping and Resuming Work: Rack back 1/2 masonry unit length in each course; do not tooth. Clean the exposed surfaces of set masonry, wet units lightly (if specified to be wetted), and remove loose masonry units and mortar prior to laying fresh masonry.
- I. Built-In Work: As the work progresses, build-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items.

### 3.4 MORTAR BEDDING AND JOINTING:

- A. Mortar Mixes: (As previously specified)
- B. Measure and batch materials either by volume or weight, such that the required proportions for mortar can be accurately controlled and maintained. Measurement of sand by shovel will not be permitted.
- C. Mix mortars with the maximum amount of water consistent with workability to provide maximum tensile bond strength within the capacity of the mortar.
- D. Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Use water clear and free of deleterious materials which would impair the work. Do not use mortar which has begun to set, or if more than 2-1/2 hours have elapsed since initial mixing. Retemper mortar during 2-1/2 hour period as required to restore workability.
- E. Lay brick and other solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints. Take extreme care to fully bed fill continuous head joints in stack bond construction.
- F. Joints: Provide jointing and maintain joint widths to match existing or as shown, except for minor variations required to maintain bond alignment, but in no case will vertical joints over 1/2 inch or under 1/4 inch be accepted. Drawing dimensions are generally modular. Lay to this module. If not shown, lay walls with 3/8" joints. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise shown.
  - 1. Concave "Sled" type jointer, 1/2" round case-hardened or stainless steel, 16 inches minimum length, minimum 1/8" depth from wall face.
  - 2. Raked In joints for preparation for application of calking and sealants and where shown.
- G. Remove masonry units disturbed after laying, clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.
- 3.5 FLASHING OF MASONRY WORK:

- A. Provide concealed flashings in masonry work at, or above, all shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to direct such water to the exterior. Prepare masonry surfaces smoothly and free from projections which might puncture flashing. Place through-wall flashing on bed of mortar and cover with mortar. Seal flashing penetrations with mastic before covering with mortar. Terminate flashings 1/2" beyond face of exterior Wythe.
  - 1. Extend flashings the full length of lintels, shelf angles and sills (if any) at least 4" into masonry at each end and turn up edge on sides to form pan to direct moisture to exterior. Extend flashing from a line 1/2" beyond the exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 8", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2".
  - 2. Provide weepholes in the head joints of the same course of masonry bedded in the flashing mortar, spaced 16" o/c. at brick and 24" o/c. at CMU, unless shown otherwise.
  - 3. Interlock end joints of deformed metal flashings by overlapping deformations not less than 1-1/2" and seal lap with elastic sealant.
  - 4. Install fabric flashing in as long lengths as possible. Splice all joints by rolling back top layer of fabric 4". Interlock the pieces and coat all contacting surfaces with approved plastic cement.
- B. Install reglets and nailers for flashing and other related work where shown to be built into masonry work.

# 3.6 REPAIR, POINTING AND CLEANING: (For areas of "new" construction)

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install them in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of calking or sealant compounds, if any joint is to be so treated. Joints to be exposed shall be tooled to match existing adjacent, and stippled, to approximate the original joint finish.
- C. Cleaning:
  - 1. Clean exposed brick masonry surfaces by the bucket and brush hand cleaning method.
  - 2. If cleaning with liquid solutions, protect abutting non-masonry surfaces. As such solutions may affect the finishing of those surfaces.
  - 3. Clean all re-pointed areas with a low to medium pressure wash and stiff nylon bristle brushes to eliminate excess mortar and job residue as the work progresses. (NO ACIDIC CLEANING MATERIALS WILL BE PERMITTED.)
- 3.7 SEALING:
  - A. Apply Prosoco Sure Klean Weather Seal Siloxane PD all on non-painted brick.
- 3.8 WATERPROOFING:

- A. Protect all plant material, painted surfaces, glass and non-masonry surfaces from over-spray of waterproofing material.
- B. Protect all other masonry work, especially the limestone and polished granite from contact with the waterproofing material.
- C. Take caution to protect all glass, window frames and non-masonry surfaces from waterproofing.
- D. Apply waterproofing material, at a rate recommended by the manufacturer.

END OF SECTION 04 01 20

## SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Structural steel.
  - 2. Grout.
- B. Related Sections:
  - 1. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements.
  - 2. Division 05 Section "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other metal items not defined as structural steel.
  - 3. Division 06 Section "General Carpentry".
  - 4. Division 09 painting Sections for surface-preparation and priming requirements.

#### 1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Heavy Sections: Rolled and built-up sections as follows:
  - 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches.
  - 2. Welded built-up members with plates thicker than 2 inches.
  - 3. Column base plates that are thicker than 2 inches.
- C. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

### 1.4 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering analysis by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
  - 1. Select and complete connections using schematic details indicated and AISC 360.
  - 2. Use LRFD; data are given at factored-load level.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.

- 1. Include embedment drawings.
- 2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
- 3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
- 4. Identify members and connections of the seismic-load-resisting system.
- 5. Indicate locations and dimensions of protected zones.
- 6. Identify demand critical welds.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:
  - 1. Power source (constant current or constant voltage).
  - 2. Electrode manufacturer and trade name, for demand critical welds.

### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer, fabricator, professional engineer, and/or testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
  - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 2. Direct-tension indicators.
  - 3. Tension-control, high-strength bolt-nut-washer assemblies.
  - 4. Shop primers.
  - 5. Nonshrink grout.
  - 6. Structural steel
- F. Source quality-control reports.

# 1.7 QUALITY ASSURANCE

- A. The erection contractor to have a minimum of five [5] years experience in erection of projects of the size, scope, and project requirements or two [2] years with a AISC Certified Steel Erector Certification [CSE]. A CSE while not a mandatory requirement for this project nor specifically required for this project, certification is preferred. However, at a minimum the following is required for the erection contractor.
  - 1. All welders are qualified per American Welding Society (AWS) D1.1. Written welding procedures, compliant with AWS specifications, to be used by welders.
  - 2. Written bolting procedures, compliant with the Research Council on Structural Connections (RCSC) specifications are required.
  - 3. An effective procedure for contract and project specification review that provides information necessary for contract compliance to all responsible individuals in the organizations.
  - 4. An effective method is in place to issue and manage requests for information [RFI] necessary to resolve discrepancies or variations from original contract requirements.
  - 5. Methods for qualification of inspection personnel and a procedure for inspection to verify that product quality meets project requirements.

- 6. Material is ordered in accordance with design drawings and specifications, and an inspection procedure is in place to ensure material received meets the purchase order and ASTM requirements.
- 7. Written procedures for correction of non-conforming work are understood and used.
- 8. Crane operators are CCO Certified or have equivalently trained and/or experienced. Written documentation will be required.
- B. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- C. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- D. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1, P2, P3 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code Steel."
  - Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- F. Comply with applicable provisions of the following specifications and documents:
  - 1. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2"
  - 2. AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings"
  - 3. AISC's "Specification for the Design of Steel Hollow Structural Sections"
- G. Comply with applicable provisions of the following specifications and documents:
  - 1. AISC 303.
  - 2. AISC 341 and AISC 341s1.
  - 3. AISC 360.
  - 4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- H. Preinstallation Conference: Conduct conference at Project site.

### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. 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 the packaged materials from corrosion and deterioration.
  - 1. 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.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

#### 1.9 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of 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

### 2.1 STRUCTURAL-STEEL MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than the following:
  - 1. Channels, Angles
  - 2. Plate and Bar: 25 percent.
  - 3. Cold-Formed Hollow Structural Sections: 25 percent.
  - 4. All Other Steel Materials: 25 percent.
- C. Channels, Angles, S-Shapes: ASTM A 36/A 36M.
- D. Plate and Bar: ASTM A 36/A 36M.
- E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- F. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- G. Steel Forgings: ASTM A 668/A 668M.
- H. Welding Electrodes: Comply with AWS requirements.

### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
  - 1. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with plain finish.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers with plain finish.
  - 1. Direct-Tension Indicators: ASTM F 959, Type 490, compressible-washer type with plain finish.
- C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers.
  - 1. Finish: Hot-dip or mechanically deposited zinc coating.

- 2. Direct-Tension Indicators: ASTM F 959, Type 325, compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.
- D. Headed Anchor Rods: ASTM F 1554, Grade 55, weldable, straight.
  - 1. Nuts: ASTM A 563hex carbon steel.
  - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 3. Washers: ASTM F 436, Type 1, hardened carbon steel.
  - 4. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C as indicated.
- E. Threaded Rods: A 572/A 572M, Grade 50.
  - 1. Nuts: ASTM A 563hex carbon steel.
  - 2. Washers: ASTM F 436, Type 1, hardened carbon steel.
  - 3. Finish: Plain or Hot-dip zinc coating, ASTM A 153/A 153M, Class C as indicated.
- F. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.
- G. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

## 2.3 PRIMER

- A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- C. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

### 2.4 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 360.
  - 1. Identify high-strength structural steel according to ASTM A 6/A 6M 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 shoppriming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to the greatest extent possible.
  - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, mechanically thermal cut, 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 SSPC-SP 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning."
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.

- 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
- 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

#### 2.5 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: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and 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 in AISC 303 for mill material.

#### 2.6 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
  - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  - 2. Surfaces to be field welded.
  - 3. Surfaces to be high-strength bolted with slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change the color of the second coat to distinguish it from the first.
- D. Painting: Prepare steel and apply a one-coat, non-asphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils.

# 2.7 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  - 1. Fill vent and drain holes that will be exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize all lintels, shelf angles, and welded door frames attached to structural-steel frame and located in exterior walls.

#### 2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
  - 1. Provide a 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 tested and 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/D1.1M 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/D1.1M 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/D1.1M.

### PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary shoring, 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.
  - 1. Do not remove temporary shoring supporting composite deck construction until cast-inplace concrete has attained its design compressive strength.

# 3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bondreducing materials and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tightened anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and 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 within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form 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 it is indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

### 3.4 FIELD CONNECTIONS

- A. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smoothly.
  - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
  - 4. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent evidence of the weld show-through on exposed steel surfaces.
    - a. Grind butt weld flush.
    - b. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

### 3.5 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: 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: Field welds will be visually inspected according to AWS D1.1/D1.1M.

- 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M 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. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests on additional shear connectors to see if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 05 12 00

SECTION 05 50 00 - METAL FABRICATIONS

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. DESCRIPTION OF THE WORK:
  - 1. The extent of metal fabrication work is shown and includes items fabricated from steel shapes, plates, bars, strips, tubes, pipes and castings which are not part of structural steel or other metal systems in other sections of these specifications. Such work includes but is not limited to:
  - 2. Section Includes:
    - a. Miscellaneous steel framing and supports.
    - c. Shelf angles.
    - g. Bolts, anchors, nuts, washers, fastening devices, etc.
    - h. Miscellaneous structural steel, metals and supports, including angles, loose bearing plates, lintels and supports.
    - i. Steel plate.
- C. Products furnished, but not installed, under this Section:
  - 1. Loose steel lintels.
  - 2. Anchor bolts.
  - 3. Steel weld plates and angles for casting into concrete.

#### 1.2 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
  - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

### 1.3 RELATED WORK UNDER OTHER SECTIONS;

- A. Division 05 Section Structural Steel.
- B. Division 09 Section Painting
- 1.4 QUALITY ASSURANCE;
  - A. Code and Standards:
    - 1. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including "Commentary of the AISC Specifications".
    - 2. AISC "Specification for the Design of Cold-Formed Steel Structural Members".
    - 3. AWS "Structural Welding Code".

- B. Qualification for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure". Welding operators shall be qualified in accordance with Section 05 of AWS D1.1 Qualification records shall be maintained at the site for review by the Inspection Agency representative and the Architect, when requested.
- C. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting wherever taking field measurements before fabrication might delay work.
- D. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.
- E. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

# 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Paint products.
  - 2. Grout.
- B. Manufacturer's Data: For information only, submit copies of manufacturer's specifications, anchor details and installation instructions for products to be used in the fabrication of miscellaneous metal work, including paint products. Transmit copy of instructions to Installer.
- C. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal assemblies. Include plans and elevations at not less than 1" to 1'-0" scale, and include details of sections and connections at not less than 3" to 1'-0" scale. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.
- D. Samples: For each type and finish of extruded nosing and tread.
- E. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

# PART 2 - PRODUCTS

- 2.1 METALS, GENERAL
  - A. Metal Surfaces, General: Provide materials with smooth, flat surfaces without blemishes.
- 2.2 FERROUS METALS
  - A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trades names and roughness.
  - B. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent
  - C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - D. Steel Tubing: ASTM A 500, cold-formed steel tubing.

# 2.3 FASTENERS

- A. General: Provide zinc-coated fasteners, with galvanizing complying with ASTM A 153, for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required for the installation of miscellaneous metal items.
  - 1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
  - 2. Lag Bolts: FS FF-B-561, square head type.
  - 3. Machine Screws: FS FF-S-92, cadmium plated steel.
  - 4. Plain Washers: FS FF-W-92, round general assembly, grade carbon steel.
  - 5. Lock Washers: FS FF-W-84, helical spring type, carbon steel.
  - 6. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
  - 7. Toggle Bolts: Tumble-wing type; FS FF-B-588, type, class and style as required.
- B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

### 2.4 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
- B. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- C. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Weld corners and seams continuously, complying with AWS recommendations. Grind exposed welds smooth and flush, to match and blend adjoining surfaces.
- E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts.
- F. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices as shown and as required to provide adequate support for intended use.
- G. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finish hardware and similar items.
- H. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- I. Galvanizing: provide a hot-dip zinc coating, with the addition of 0.05 0.09% Nickel to the zinc bath, for those items supporting or built-into exterior masonry or concrete, steel items exposed to the weather, and other items shown or specified to be galvanized, as follow:
  - 1. ASTM A 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plate, bars and strip 1/8" thick and heavier.

- 3. After pickling and prior to galvanizing, the steel shall be immersed in a bath of zinc ammonium chloride. The dry kettle process shall be used to eliminate any flux inclusions on the surface of the galvanized material.
- J. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- K. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors as indicated. If not indicated, at not more than 24 inches o.c. maximum spacing.

#### 2.5 MISCELLANEOUS METAL FABRICATIONS:

- A. Loose Bearing Plates:
  - 1. Provide for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area, as indicated. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

### 2.6 MISCELLANEOUS MATERIALS

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.
- B. Concrete: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3,000 psi (20 MPa) minimum.
- 2.7 FRAMING AND SUPPORTS
  - A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
  - B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

### 2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
- C. Galvanize exterior miscellaneous steel trim.

### 2.9 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

# 2.10 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

### 2.11 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

### PART 3 - EXECUTION

#### 3.1 INSPECTION:

A. Examine the areas and conditions under which miscellaneous metal items are to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION:

A. Furnish setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

### 3.3 INSTALLATION:

- A. Setting Loose Bearing Plates:
  - 1. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.
  - 2. Set loose bearing plates on wedges, or other adjustable devices. After the joints have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with mortar.
  - 3. Pack bedding mortar solidly between bearing surfaces and plates to ensure that no voids remain.

#### 3.4 GALVANIZING:

- A. Completely clean interior as well as exterior surfaces and coat with zinc. Provide vent holes for air and frothy fluxes to be allowed to flow upward and completely out; cleaning solutions and molten zinc must be allowed to flow in and completely wet surfaces.
- B. Interconnect all sections of fabricated pipework with full open tee or with miter joints. Each enclosed section must be provided with a vent hole at each end.
- C. Base plates and end plates must be designed to facilitate venting and draining. Fully cutting the plate provides minimum obstruction to a full, free flow into and out of the pipe. Since this is not always possible, the use of vent holes in the plate often provides a solution.
- D. Completely submerge tubular structures in one dip in the galvanizing kettle.
- E. In rectangular hollow shapes, the four corners of the internal gusset plates should be cropped. Internal gusset plates in all large hollow sections should be provided with an additional opening at the center.

## 3.5 FASTENING TO IN-PLACE CONSTRUCTION:

A. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items, including ladder, cages, alternating tread ladders, etc. to in-place construction; using

threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, wood screws and other connectors as required.

### 3.6 CUTTING, FITTING AND PLACEMENT:

- A. Perform cutting, drilling and fitting required for installation of miscellaneous metal items. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry, or similar construction.
- B. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

### 3.7 FIELD WELDING:

A. Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

### 3.8 ADJUSTING AND CLEANING:

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

### 3.9 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
- C. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.10 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05 50 00

## SECTION 06 06 20 - PLASTIC LAMINATE

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. The extent of each type of Decorative Plastic Laminate is shown.
- B. The types of Decorative Plastic Laminate include, but are not necessarily limited to, the following:
  - 1. High Pressure Laminate (HPL)
- C. The installation and finishing of Decorative Plastic Laminates include, but is not necessarily limited to:
  - 1. Factory finishing of the work in this Section.
  - 2. Edge Banding
  - 3. Installation of the work in this Section.

### 1.3 RELATED WORK UNDER OTHER SECTIONS:

A. Division 6 Section – "Rough Carpentry".

### 1.4 QUALITY ASSURANCE:

- A. Quality Standards: Except as otherwise shown or specified, comply with specified provisions of the following:
  - 1. Architectural Woodwork Institute (AWI) "Quality Standards", current edition.
- B. Manufacturer Qualifications: Manufacturer producing products in an ISO 9001, ISO 14001, and OHSAS 18001 certified facility.
- C. Fabricator Qualifications: Minimum of three years documented experience in fabricating decorative plastic laminates similar in scope and complexity of this Project.
- D. Installer Qualifications: Minimum of three years documented installation experience for projects similar in scope and complexity to this Project.
- E. Compliance shall be provided by the firm through the application of AWI Quality Certification Program labels on the work according to AWI/QCP labeling guidelines.

- F. Certification Labels shall be applied to each item of work.
  - 1. The Contractor, upon award of the Work, shall register the work under this section with the AWI Quality Certification Program. AWI QCP Phone 1-800-449-8811.

### 1.5 SUBMITTALS:

- A. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for each item of factory-fabricated Laminate.
  - 1. Quality Certification: Submit manufacturer's (fabricator's) certification, stating that the fabricated work meets the woodwork grade(s) specified.
- B. Samples: Submit samples for each Decorative Plastic Laminate Product:

### 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Storage and Protection: Store plastic laminate materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer. Store sheet materials flat on pallets or similar rack-type storage to preclude damage.
- B. Do not deliver laminates until painting, wet work, grinding and similar operations which could damage, soil, or deteriorate laminates have been completed in installation areas. If, due to unforeseen circumstances, laminates must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas. Comply with AWI.

### 1.7 JOB CONDITIONS:

- A. Examine the substrates and conditions under which the work is to be installed; and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Environmental Requirements: Ensure appropriate acclimatization between plastic laminate and substrate prior to fabrication. Condition plastic laminate and substrate surfaces in the same environment for 48 hours prior to fabrication. Condition at approximately 75 deg F (24 deg C) and 45 percent to 55 percent relative humidity.
- C. Adhesive: For best results, apply adhesives at temperatures at or above 65 degrees F.
- D. Field Measurements: Verify actual measurements and openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

PART 2 - PRODUCTS

### 2.1 SCHEDULE OF MATERIALS

### 2.2 BASIC MATERIALS AND FABRICATION METHODS

- A. Basis of Design:
  - 1. A Wilsonart, 2501 Wilsonart Drive, Temple, TX 76503- 6110. Tel. 254.207.7000, Toll-Free 800.433.3222, Fax 254.207.2384. Website: www.wilsonart.com
  - 2. Other acceptable manufacturers:

a. Formica

- b. Decotone Surfaces
- B. Laminate Composition: Decorative surface papers impregnated with melamine resins and pressed over kraft paper core sheets impregnated with phenolic resin. Sheets then bonded together under pressures greater than 1,000 lbs. per sq. in. and high temperatures approaching 300 deg F (149 deg C). Finished sheets trimmed and backs sanded to facilitate bonding to substrate.
- C. General: Where counters are indicated or required, provide complete with plastic laminated faces, edges, backsplashes and side splashes. Provide balancing (backing) sheets where required by AWI 400-26.
- D. Material Surface Quality:
  - 1. Horizontal Surfaces: Grade 10 (0.048" thick), general-purpose type, (high pressure).
  - 2. Horizontal Surfaces: Grade 41 (0.051" thick), solid core type, high pressure.
  - 3. Exposed Surfaces: Grade 20 (0.048" thick), general-purpose type (high-pressure).
  - 4. Semi-Exposed parts: High-Pressure Laminate compatible color, nominal .028" thick.
  - 5. Concealed parts: Grades 72 or 91, as required, (0.020" thick), backer type, (high-pressure).
  - 6. Colors, textures, finish (reflectance) and patterns as selected by architect from full color line including Premium.
- E. Core: 3/4" thick particleboard, CS 236, Type 2, medium density, Class 1; Norbord "MR" Medium Density Fiberboard, Wheat Board; or other AWI approved core materials.
- F. Quality for Integral Work: Where plastic laminate finished elements are an integral part of wood casework, provide same Quality Grade specified for other portions of casework.

## 2.3 STANDARD DECORATIVE LAMINATES

- A. Product: Plastic Laminate HPL
  - 1. Enhanced Laminate Performance: Fabricate laminate with AEON™ Enhanced.
  - 2. Performance Technology for increased surface wear resistance and surface abrasion.
  - 3. Antimicrobial Protection Agents: Available with finish 35
  - 4. Laminate Conformance Standard: ISO 4586, Grade HGS.
  - 5. Color, Pattern, and Finish: To be selected by Architect

## PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine surfaces for conditions that could adversely affect the performance of the decorative plastic laminate installation, including edge performance.
- B. Surfaces to be adhesively bonded shall be clean, dry and free of any dust, loose paint, wax, moisture, dirt, grease, oil, rust, or other contaminants.
- C. Commencement of work will constitute acceptance of existing conditions and surfaces to receive the work.
- 3.2 INSTALLATION, GENERAL
  - A. Install materials according to referenced Specification Sections and the following conformance standards as applicable:
    - 1. AWI AWS.
    - 2. KCMA A161.1.
  - B. To avoid stress cracking, do not use square-cut inside corners. All inside corners have a minimum 1/8-inch radius and all edges routed smooth.
  - C. Drill oversized holes for screws, bolts, and similar fasteners. Slightly countersink fasteners into the face side of laminate-clad substrate.
  - D. Use carbide-tipped saw and router blades for cutting, with high tool speed and low feed speed. Keep cutting blades sharp. Use appropriate hold-downs to prevent vibration.

### 3.3 ADHESIVE SPRAY APPLICATIONS

- A. Comply with adhesive manufacturer's printed installation instructions.
- B. Apply contact adhesive uniformly to both surfaces and with a minimum 80 percent coverage for each surface. Apply PVA adhesive to one side with a minimum 80 percent coverage.
- C. Apply two coats of adhesive to porous surfaces. Provide 100 percent coverage for edges.
- D. Apply uniform downward pressure (30 to 40 psi minimum) across the entire bonded surface.

### 3.4 ADHESIVE BRUSH APPLICATIONS

- A. Comply with adhesive manufacturer's printed installation instructions.
- B. Apply contact adhesive uniformly to both surfaces with a brush or solvent-resistant medium nap roller; cover each surface 100 percent. Apply PVA adhesive to one side, for 100 percent coverage.
- C. Provide two coats of adhesive on porous surfaces. Double coat edges.
- D. Apply uniform downward pressure (30 to 40 psi minimum) across the entire bonded surface.
- 3.5 CLEANING AND PROTECTION

- A. Clean decorative plastic laminate according to manufacturer's printed care and maintenance instructions.
- B. Protect installed products and finish surfaces from damage during remainder of construction period

END OF SECTION 06 06 20

SECTION 06 10 00 - ROUGH CARPENTRY

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Materials and installation requirements for other work, commonly assigned to carpentry trade, are specified in other sections of these specifications.
- B. The types of carpentry work specified in this section include (but are not necessarily limited to) the following:
  - 1. Wood furring.
  - 2. Wood nailers and blocking.
  - 3. Miscellaneous wood framing.
  - 4. Plywood backing panels.

### 1.3 RELATED WORK UNDER OTHER SECTIONS

- 1. Division 06 Section Rough Carpentry and Miscellaneous Rough Carpentry for plywood backing panels.
- 2. Division 07 Section "Sound Attenuation Insulation"
- 3. Division 09 Sections "Gypsum Board"
- 4. Division 26, 27, and 28 Sections for Electrical, Communications, and/or Security wall mounted equipment.

### 1.4 DELIVERY, STORAGE, AND HANDLING

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

### PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.

- 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
- 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

## 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
  - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. blocking, furring, and similar concealed members in contact with masonry or concrete.

### 2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Provide wood for support or attachment of other work such as nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes shown or specified, worked to shapes shown, and as follows:
    - a. Moisture Content: 15% maximum for lumber items not specified to receive wood preservative treatment.
  - 2. Grade: Construction Grade light framing size lumber of any species, or board size lumber, as required. Provide Construction Grade boards (RIS or WCLIB) or No. 2 boards (SPIB or WWPA).
- B. For items of dimension lumber size, provide Construction, or No. 2 grade lumber and any of the following species with moisture content not exceeding 15%:
  - 1. Hem-fir (north); NLGA.
  - 2. Mixed southern pine; SPIB.
  - 3. Spruce-pine-fir; NLGA.
  - 4. Hem-fir; WCLIB or WWPA.
  - 5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
  - 6. Western woods; WCLIB or WWPA.
  - 7. Northern species; NLGA.
  - 8. Eastern softwoods; NeLMA.
- C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

- 1. Mixed southern pine; No. 2 grade; SPIB.
- 2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
- 3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
- 4. Eastern softwoods; No. 2 Common grade; NeLMA.
- 5. Northern species; No. 2 Common grade; NLGA.
- 6. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: NES NER-272.
- C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
  - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).
- E. Wood Screws: ASME B18.6.1
- F. Screws for securing wood to metal stud framing: Self tapping: Teks #12 2-3/4 in. Phillips Flat-Head Self-Drilling Screws manufactured by ITW Buildex and Illinois Tool Works, Inc; Phillips II Plus Wood to Metal Screws manufactured by Phillips Fasteners, Fastenal or other similar products specifically recommended for use securing wood to metal stud framing.
- G. Screws specifically designed for securing through metal to wood blocking #10-24x 1-7/16-inch self-drilling flat head as manufactured by Fastenal; ITW Buildex and Illinois Tool Works; Phillips Fasteners, or other manufacturer providing products specifically designed for securing blocking when first drilling through metal to engage the wood blocking.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. NES NER-272 for power-driven fasteners.
  - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
  - 4. Wood Screws: ASME B18.6.1
- G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- H. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
  - 1. Comply with approved and/or indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
  - 2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
  - 3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

### 3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet or sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- C. Where wood preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

END OF SECTION 06 10 00

### SECTION 07 21 50 - SOUND ATTENUATION BATTS

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section Includes: Glass fiber acoustical insulation for interior wall partitions as indicated.

### 1.3 MATERIALS PROVIDED IN OTHER SECTIONS

- A. Division 06 "Rough Carpentry".
- B. Division 09 Section "Gypsum Drywall".
- C. Division 09 Section "Non-Structural Metal Framing".

#### 1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM).
  - 1. C 665 Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - 2. E 84 Test Method for Surface Burning Characteristics of Building Materials.
  - 3. E 119 Test Method for Fire Tests of Building Construction Materials.
  - 4. E 136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.

### 1.5 SUBMITTALS

A. Product Data: Submit product literature, samples, and installation instructions for approved insulation.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.
- B. Label insulation packages to include material name, production date and/or product code.

### PART 2 - PRODUCTS

### 2.1 MANUFACTURER

A. Owens Corning, as specified; equivalent products by Certainteed or Johns Manville may be submitted for approval.

### 2.2 MATERIAL

- A. Type: OC "Sound Attenuation Batts", unfaced glass fiber acoustical insulation complying with ASTM C 665, Type I.
  - 1. Size:
    - a. Thickness: as detailed, to provide indicated STC
    - b. Width: To suit stud spacing
  - 2. Surface Burning Characteristics: When tested in accordance with ASTM E 84.
    - a. Maximum flame spread: 10
    - b. Maximum smoke developed: 10
  - 3. Combustion Characteristics: Noncombustible, tested in accordance with ASTM E 136.
  - 4. Fire Resistance Ratings: Wall assemblies containing Owens Corning SAB have achieved fire resistance ratings when tested in accordance with ASTM E119. See listing documents for full assembly construction details.
  - 5. Sound Transmission Class: STC required, as indicated in details.
  - 6. Dimensional Stability: Linear shrinkage less than 0.1 %
- B. Concealed Blanket Type Insulation:
  - 1. Poly-encapsulated, formaldehyde-free fiberglass insulation above indicated ceilings.

### 2.3 BLANKET INSULATION:

- A. Provide above ceiling insulation, as shown, equal to "Johns Manville ComfortTherm Formaldehyde-free Thermal and Acoustical Fiber Glass Insulation." Thermal resistance "R" (RSI) values of the insulation shall be R (RSI) 19 in ceilings.
- B. Criteria:
  - 1. ASTM C 665, Type II, Class A, Category 1
  - 2. ASTM E 96 Permeability; vapor retarder facer films on standard product: 0.5 Perms.
  - 3. UL File R3711
  - 4. ASTM E 84 Flame Spread 25 or less, Smoke Developed 50 or less

### PART 3 - EXECUTION

# 3.1 INSPECTION AND PREPARATION

- A. Examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with the requirements of the section in which substrate and related work is specified.
- B. Obtain installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
- C. Clean substrates of substances harmful to insulation.

## 3.2 INSTALLATION-GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case.
- B. Sound Attenuation Batts may be friction-fit in place until the interior finish is applied. Install batts to fill entire stud cavity. If stud cavity is less than 96" in height, cut lengths to friction fit against floor and ceiling tracks. Walls with penetrations require that insulation be carefully cut to fit around outlets, junction boxes and other irregularities.
- C. Where walls are not finished on both sides or insulation does not fill the cavity depth, provide manufacturer approved supplementary support to hold insulation in place.
- D. Where insulation must extend higher than 8 feet, temporary support can be provided to hold product in place until the finish material is applied.
- E. Extend fiberglass insulation full thickness as shown over entire surface. Cut and fit tightly around obstructions, and fill voids with insulation. Install a single layer, unless otherwise shown, with joints staggered in one direction.
  - 1. Provide two layers for applications in excess of 6".

### 3.3 PROTECTION

A. Protect installed insulation as recommended by the approved manufacturer.

END OF SECTION 07 21 00

# SECTION 074110 - METAL ROOF PANELS

# PART 1 - GENERAL

# 1.1 RELATED DOCUMENTS

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

# 1.2 SUMMARY

- A. Section Includes:
  - 1. Exposed-fastener, lap-seam metal roof panels.
- B. Related Sections:
  - 1. Division 05 Section "Structural Steel Framing".
  - 2. Division 07 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.
  - 3. Division 05 "Metal Fabrications"

# 1.3 DEFINITIONS

A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight roofing system.

# 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- C. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
  - 1. Uplift Rating: per IBC and RISBC requirements
- D. FMG Listing: Provide metal roof panels and component materials that comply with requirements in FMG 4471 as part of a panel roofing system and that are listed in

FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

- E. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
  - 1. Wind Loads: Determine loads based on the following minimum design wind pressures: per IBC and RISBC requirements
  - 2. Snow Loads: 30 lbf/sq. ft.
  - 3. Deflection Limits: Metal roof panel assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/240 of the span.

# 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
  - 1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):
    - a. Flashing and trim.
    - b. Gutters.
    - c. Downspouts.
- C. Samples for Initial Selection: For each type of metal roof panel indicated with factoryapplied color finishes.
  - 1. Include similar Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Metal roof Panels: 12 inches (300 mm) long by actual panel width. Include fasteners, clips, closures, and other metal roof panel accessories.
  - 2. Trim and Closures: 12 inches (300 mm) long. Include fasteners and other exposed accessories.
  - 3. Accessories: 12-inch- (300-mm-) long Samples for each type of accessory.

# 1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Roof plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installers of the items involved:

- 1. Roof panels and attachments.
- 2. Purlins and rafters.
- 3. Roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, snow guards, and items mounted on roof curbs.
- B. Manufacturer Certificates: Signed by manufacturer certifying that roof panels comply with energy performance requirements specified in "Performance Requirements" Article.
  - 1. Submit evidence of meeting performance requirements.
- C. Qualification Data: For qualified installer.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- E. Field quality-control reports.
- F. Warranties: Samples of special warranties.
- 1.7 CLOSEOUT SUBMITTALS
  - A. Maintenance Data: For metal roof panels to include in maintenance manuals.
- 1.8 QUALITY ASSURANCE
  - A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
  - B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
  - C. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.
  - D. Surface-Burning Characteristics: Provide metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - 1. Flame-Spread Index: 25 or less.
    - 2. Smoke-Developed Index: 450 or less
  - E. Fire-Resistance Ratings: Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

- 2. Combustion Characteristics: ASTM E 136.
- F. Preinstallation Conference: Conduct conference at project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal roof panel Installer, metal roof panel manufacturer's representative, and installers whose work interfaces with or affects metal roof panels including installers of roof accessories and roof-mounted equipment.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal roof panel installation, including manufacturer's written instructions.
  - 4. Examine deck substrate and purlin and rafter conditions for compliance with requirements, including flatness and attachment to structural members.
  - 5. Review structural loading limitations of deck, purlins and rafters during and after roofing.
  - 6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
  - 7. Review temporary protection requirements for metal roof panel assembly during and after installation.
  - 8. Review roof observation and repair procedures after metal roof panel installation.
  - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

# 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.
- E. Protect foam-plastic insulation as follows:
  - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  - 2. Protect against ignition at all times.

# 1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

# 1.11 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of deck, purlins and rafters and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

# 1.12 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, cracking, or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: 2 years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 10 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Weathertight Warranty Period: 10 years from date of Substantial Completion.

# PART 2 - PRODUCTS

# 2.1 EXPOSED-FASTENER, LAP-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.
- B. Corrugated-Profile, Exposed-Fastener Metal Roof Panels as indicated on drawings.
   1. Basis-of-Design Product: Pac Clad.
  - a. AEP-Span.
  - b. Alcoa Inc.
  - c. CENTRIA Architectural Systems.
  - d. Copper Sales, Inc.
  - e. Fabral.
  - f. Flexospan Steel Buildings, Inc.
  - g. Galvamet; Galvacer Building Systems.
  - h. MBCI; a division of NCI Building Systems, L. P.
  - i. McElroy Metal, Inc.
  - j. Metal Sales Manufacturing Corporation.
  - k. Metecno-Morin Corporation; Division of Metecno Inc.
  - 2. Material: Zinc-coated (galvanized) steel sheet
    - a. Exterior Finish: match existing finish
    - b. Color: match existing color and finish.
  - 3. Panel Coverage: 34.67 inches (881 mm)
  - 4. Panel Height: 0.875 inch (22 mm)

# 2.2 ACCESSORIES

- A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
  - 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
  - 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefinfoam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile.

Provide closure strips where indicated or necessary to ensure weathertight construction.

- 3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
- B. Flashing and Trim: Formed from same material as roof panels, prepainted with coil coating, thickness as noted on drawings. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.
- C. Gutters: Formed from same material roof panels. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2400-mm-) long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches (900 mm) o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels and trim.
- D. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot- (3-m-) long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual". Finish downspouts to match gutters.

# 2.3 FABRICATION

- A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal roof panel side laps with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will seal weathertight and minimize noise from movements within panel assembly.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  - 2. End Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
  - 3. End Seams for Other Than Aluminum: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

- 4. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
- 6. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's "Architectural Sheet Metal Manual" or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

# 2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

# PART 3 - EXECUTION

# 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.
- B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
- C. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
- D. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
- E. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.
- B. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written instructions.
- 3.3 METAL ROOF PANEL INSTALLATION, GENERAL
  - A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
  - B. Install metal roof panels as follows:
    - 1. Commence metal roof panel installation and install minimum of [300 sq. ft. (27.8 sq. m.)] in presence of factory-authorized representative.
    - 2. Field cutting of metal panels by torch is not permitted.
    - 3. Install panels perpendicular to purlins.
    - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
    - 5. Provide metal closures
    - 6. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
    - 7. End Splices: Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
    - 8. Install metal flashing to allow moisture to run over and off metal roof panels.
  - C. Fasteners:
    - 1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
  - D. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
  - E. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
    - 1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.
  - F. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

- 1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
- 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

# 3.4 METAL ROOF PANEL INSTALLATION

- A. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
  - 1. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
  - 2. Lap ribbed or fluted sheets one full rib corrugation.
  - 3. Provide metal-backed neoprene or EPDM washers under heads of exposed fasteners bearing on weather side of metal roof panels.
  - 4. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
  - 5. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
  - 6. At panel end splices, nest panels with minimum 6-inch (150-mm) end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

# 3.5 METAL SOFFIT PANEL INSTALLATION

- A. In addition to complying with requirements in "Metal Roof Panel Installation, General" Article, install metal soffit panels to comply with requirements in this article.
- B. Metal Fascia Panels: Align bottom of panels and fasten with blind rivets, bolts, or selftapping screws. Flash and seal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

# 3.6 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
  - 1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges

folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.

- C. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
  - 1. Provide elbows at base of downspouts to direct water away from building.
  - 2. Connect downspouts to underground drainage system indicated.

# 3.7 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

# 3.8 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
- C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

# 3.9 CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074110

SECTION 07 84 00 - FIRESTOPPING

PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

- A. Section Includes: This section includes labor, materials and equipment necessary to complete the installation required for the items specified under this Section, including but not limited to:
  - 1. Firestopping of Through Penetrations in Fire Rated Assemblies.
    - Only tested firestop systems shall be used in specific locations as follows: Penetrations for the passage of cables, conduit, and other electrical equipment through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
  - 2. Smoke and Acoustical Sealing in Non-Rated Assemblies Only tested Smoke & Acoustic systems shall be used in specific locations as follow: penetration for the passage of cables, conduits, and other electrical equipment through non-fire-rated vertical and horizontal partitions.
- B. Locations Requiring Firestopping Include, but not limited to, the following locations:
  - 1. Through-penetration firestopping in fire rated wall, floor, and roof construction.
  - 2. Construction gap and joint firestopping within fire-rated walls, floors or floor-ceiling assemblies.
  - 3. Construction gap and joint firestopping at intersections of the same or different materials in fire-rated construction.
  - 4. Construction gap and joint firestopping at the top of fire-rated walls.
  - 5. Openings around structural members that penetrate floors or walls.
  - 6. Openings and penetrations in fire-rated partitions or walls containing fire rated doors.
  - 7. Openings between structurally separated sections of walls or floors.
  - 8. Expansion joints in fire rated walls and/or floors.
  - 9. Through-penetration and Construction gap and joint smoke stopping in smoke partitions.

# 1.3 RELATED SECTIONS

- A. Division 07 Section Joint Sealers.
- B. Division 09 Nonstructural metal framing
- C. Division 26
- D. Division 27
- E. Division 28
- 1.4 DEFINITION

- A. Fire Rated Assembly: Includes all fire rated walls, floors, floor/ceiling and roof system assemblies. Ratings shall be as per ASTM E 119 or UL 263.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Use of a material or combination of materials to fill or seal openings in a fire-rated assembly to restore the integrity of the assembly and prevent the spread of heat, fire, gases and smoke.
- D. System: Specific products and applications, classified and numbered by Underwriter's Laboratories, Inc. to seal openings in fire-rated assemblies.
- E. Penetration: An opening or object passing through or into a fire-rated wall or floor that breaches the fire-rated assembly.
- F. Construction Gaps: Any gap, joint or opening (static or dynamic) between adjacent sections of walls or floors, at wall tops between top of wall and ceiling, exterior walls and structural floors or roof decks. Where dynamic movement is required, the system must comply with UL 2079.

## 1.5 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications:
  - 1. ASTM E 84: Standard Test Methods for Surface Burning Characteristics of Building Materials.
  - 2. ASTM E 119: Methods of Fire Tests of Building Construction and Materials.
  - 3. ASTM C 679, "Standard Test Method for Tack-Free Time of Elastomeric Sealants"
  - 4. ASTM E 814: Standard Method of Fire Tests of Through-Penetration Firestops.
  - 5. ASTM C 719: Adhesion and Cohesion of Elastomeric Joint Sealants under Cyclic Movement.
  - 6. ASTM C 920: Standard Specification of Elastomeric Joint Sealants.
- B. Underwriters Laboratories Inc. (UL) Publications:
  - 1. UL 263: Fire Tests of Building Construction and Materials
  - 2. UL 723: Surface Burning Characteristics of Building Materials.
  - 3. UL 1479: Fire Tests of Through-Penetration Firestops.
  - 4. UL 2079: Standard for Fire Tests of Joint Systems.
- C. Underwriters Laboratories "Fire Resistance Directory" (Current Year).
  - 1. Through-Penetration Firestop Device (XHJI)
  - 2. Fire-Resistive Ratings (BXUV) & (BXRH)
  - 3. Through-Penetration Firestop Systems (XHEZ)
  - 4. Fill, Void, or Cavity Material (XHHW)
  - 5. Joint Systems (XHBN)
  - 6. Forming Materials (XHKU)
  - 7. Perimeter Fire Containment Systems (XHDG)
- D. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- E. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- F. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops."
- G. Test Requirements: ASTM E 90, "Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements"
- H. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems"
- I. Test Requirements: ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials."

- J. Test Requirements: ASTM E 2178, "Standard Test Method for Air Permeance of Building Materials"
- K. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus"
- L. ANSI/TIA-1179-2010 "Healthcare Facility Telecommunications Infrastructure Standard"
- M. ANSI/TIA-EIA-569 "Commercial Building Standard for Pathway's and Spaces"

### 1.6 QUALITY ASSURANCE

- A. Do not commence work until submittals have been reviewed.
- B. Fire-Test-Response Characteristics: Provide through-penetration fire stop systems and fireresistive joint systems that comply with specified requirements of tested systems.
- C. Fire stop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- D. Provide Installation by an experienced firestopping contractor, certified, licensed or otherwise qualified by the firestopping manufacturer to install the manufacturer's products as per specified requirements.
- E. Provide all firestopping materials manufactured by one manufacturer and manufactured in their own facilities and provide documentation of same.
- F. A manufacturer's direct representative (not distributor or agent) must be on-site during initial installation of firestop and sealing systems to train contractor personnel in proper selection and installation procedures. Installation must be conducted per manufacturer's written recommendations published in their literature and drawing details
- G. Install material in accordance with manufacturer's written installation instructions.
- H. Provide materials tested to provide fire rating at least equal to that of the construction.
- I. For those firestop applications that exist for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

### 1.7 SUBMITTALS

- A. Submit in compliance with Division 1.
  - 1. Shop Drawings
    - a. Submit complete list of all firestop systems and materials to be utilized, including documentation of UL or FM classifications or approved third party testing. Include all the individual materials required for each complete system. Indicate manufacturer's product name and number for each material.
    - b. Submit drawings of through-penetrations or construction joints, which indicate the firestop system to be utilized for each different firestopping application. Drawing shall indicate construction of wall or floor assembly; size, number and material of penetrating items; firestop systems designation; required F-rating, T-rating and remarks.
    - c. For installations or configurations not covered by UL or FM design number, a recommendation shall be obtained from the Manufacturer, in writing, for the specific application, signed by a certified engineer.
  - 2. Product Data

- a. Submit copies of manufacturer's product data, Material Safety Data Sheets, specifications, recommendations, standard details and installations instructions for all firestop assemblies.
- b. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in drawing.
- c. Submit safety data sheets provided with products delivered to jobsite, as required by the Contractor as per OSHA GHS/Hazard Communication Standard.
- B. Installation Responsibility: assign installation of through-penetration firestop systems and fireresistive joint systems in Project to a single sole source firestop specialty contractor.
- C. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping/sealing manufacturer as having been provided with the necessary training to install manufacturer's products per specified requirements.
  - 1. A manufacturer's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualifications on the buyer.
  - 2. The work is to be installed by a Contractor/Installer with at least one of the following qualifications:
  - 3. FM 4991 Approved Contractor
  - 4. UL Approved Contractor
  - 5. Firestopping 'Manufacturer's' Approved or Accredited Fire Stop 'Specialty' Contractor
  - 6. Hilti Accredited Fire Stop Specialty Contractor
- D. Submit Statement of Contractor Qualifications.
  - 1. Include the Contractor/Installer's qualification as defined above.
  - 2. Include the Work Scope for the Contractor/Installer
  - 3. Include past projects of comparable scale projects or using similar systems indicating required experience for this project.

### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials undamaged to project site in manufacturer's original packaging, clearly labeled, unopened containers, clearly identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at jobsite.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature limitations
- D. Handle firestop materials in a manner providing protection from damage and exposure to the elements, in accordance with manufacturer's instructions.
- E. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- F. Material Safety Data Sheets (MSDS) will be provided on the job site for all materials. Following manufacturer's guidelines for use, handling and disposal.

### 1.9 WARRANTY

- A. Provide all firestop and firesafing materials warranted, in writing, by the manufacturer against defects in manufacturing and materials.
- B. Completed installation shall be warranted, in writing, by the installer against defects in workmanship.

### 1.10 PROJECT CONDITIONS

- A. Do not use materials that contain flammable solvents.
- B. Existing Conditions:
  - 1. Conform to Manufacturer's printed instructions for installation.
  - 2. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding
  - 3. Proceed with installation only after penetrations of the substrate have been installed.
  - 4. Weather Conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet. Also do not proceed with installation of firestop materials when temperature falls below 40° F.
- C. Environmental Requirements:
  - 1. Furnish adequate ventilation.
  - 2. During installation protect surrounding area to prevent contamination of adjacent surfaces by firestopping materials. Provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces
  - 3. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
  - 4. Firestop materials used shall not require solvent- based chemicals for clean-up purposes.
  - 5. Products allowing silicons/silicas to become airborne before or during a fire shall not be used when electronic switching devices or painting operations are located within the same building.
- D. Scheduling
  - 1. Schedule installation of cast-in place firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete. Schedule installation of firestop sleeves and smoke & acoustic sleeves before openings are made and cables are run.
- E. 2 Schedule installation of other firestopping materials after completion of penetrating item

installation but prior to covering or concealing of openings

# PART 2 - PRODUCTS

### 2.1 GENERAL REQUIREMENTS

- A. Provide firestopping materials and systems meeting the requirements specified herein.
  - 1. Design and install all firestop products and systems so that the system will allow full restoration of the thermal and fire resistance properties of the assembly being penetrated with minimal repair if penetrants are subsequently removed or added.
  - 2. Protect penetrations containing loose electrical, data or communications cabling using firestopping products that allow unrestricted cable changes without damage to seal.
  - 3. Firestopping materials and systems must be intumescent or capable of filling throughopenings created by the burning or melting of combustible pipes, pipe insulation materials or cable jacketing and the deflection of sheet metal due to thermal expansion.
  - 4. Firestop sealants must be elastomeric or flexible to allow for normal pipe movement
  - 5. All products used shall be water-resistant after drying or curing and shall be unaffected by high humidity, condensation or transient water exposure.
  - 6. Provide materials with a maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E 84.
  - 7. Provide materials with a minimum of one year shelf life.
  - 8. Materials shall not affect or de-rate the properties of cables in energized cable applications.

- 9. Supply materials compatible with materials used in building construction.
- 10. Firestop materials must not shrink upon curing.
- 11. Firestop materials must be moisture-resistant and may not dissolve in water after curing.
- 12. All materials shall be asbestos free and non-carcinogenic. Materials should meet the requirements for use in a "Green Building" as defined by the US Green Building Council and the ASTM Green Building Sub-Committee E 50.06.
- 13. Firestop materials shall not contain flammable or toxic solvents and shall not produce toxic or flammable outgassing during the drying or curing process.
- 14. Water-based, non-toxic firestop materials shall be used in lieu of silicone or solvent based materials.
- 15. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  - a. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated
- 16. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  - a. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
- 17. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  - a. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures
- 18. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating less than or equal to 01 as determined by ASTM G21.
- 19. Rain and water resistance: provide perimeter joint sealant with tack-free time (ASTM C 697) capable of meeting ASTM D6904 standard for wind driven rain resistance.
- 20. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

### 2.2 GENERAL REQUIREMENTS COMMUNICATIONS SYSTEMS

- 1. Provide firestopping and sealing materials composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- 2. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- 3. Provide a round fire-rated cable management device whenever cables penetrate fire rated walls, where frequent cable additions and changes may occur. The fire-rated cable management device of approximately 12 inches in length, shall consist of a corrugated steel tube with zinc coating, contain and inner plastic housing, intumescent material rings, and inner fabric smoke seal membrane. The fire-rated cable management device shall contain integrated intumescent firestop wrap strip materials sufficient to maintain the hourly rating of the barrier being penetrated. The fire-rated cable management device shall contain a smoke seal fabric membrane or intumescent firestop plugs sufficient to achieve the L-Rating requirements of the barrier type.
- 4. Provide a round cable management device whenever cables or cable bundles penetrate **non-fire** rated construction (e.g. smoke partition) where frequent cable additions and changes may occur. The manufacturer shall furnish independent test reports documenting the in-use sound transmission class (STC) characteristics of the non-fire rated assembly as tested per ASTM E 90. The test report shall provide the STC ratings

of the assembly while the device is in use, with a minimum of two additional data points other than 0% and 100% visual fill.

- 5. Provide non-curing, re-penetrable, intumescent firestop blocks around communication cable trays or ladder racks penetrating through fire rated walls. The firestop system assembly shall be accessible from one side of the wall. The firestop material shall allow up to 10 inches of unreinforced annular space.
- 6. Provide a non-curing, self-adhesive, surface mounted cable disc for single cables and cable bundles up to one inch (1") diameter in membrane and through penetration assemblies as tested in accordance with UL 1479 or ASTM E 814.
- 7. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  - a. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated
- 8. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  - a. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
  - b. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
- 9. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
  a. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures
- 10. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating less than or equal to 01 as determined by ASTM G21.
- 11. Rain and water resistance: provide perimeter joint sealant with a tack-free time (ASTM C 697) capable of meeting ASTM D6904 standard for wind driven rain resistance.
- 12. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement

### 2.3 THROUGH-PENETRATION FIRESTOPPING OF FIRE-RATED CONSTRUCTION

- A. Through-penetration firestop product(s) tested to ASTM E814 listed in the UL Fire Resistance Directory in which it is classified as a fill, void or cavity material or a firestop device. This should be classified for approval with the particular type of penetrating item and the wall or floor assembly that the item is penetrating in order to maintain the integrity required.
  - 1. All firestopping products must be from a single manufacturer.

### 2.4 CONSTRUCTION GAP AND JOINT FIRESTOPPING OF FIRE-RATED CONSTRUCTION

- A. Identify the gap/joint to be sealed as a dynamic (movement) or static (no movement) system. Products used for dynamic joints must be tested to and passed UL 2079, Standard for Fire Tests of Joints.
- B. Joints should be classified as: Floor to Floor, Wall to Wall, Floor to Wall or Top of Wall.
- C. All firestopping products must be from a single manufacturer.

### 2.5 ACCESSORIES

A. Fill, void or cavity materials: As approved in the UL Fire Resistance Directory or Factory Mutual Approval Guide.

- B. Forming materials: As approved in the UL Fire Resistance Directory or Factory Mutual Approval Guide.
- 2.6 ACCEPTABLE MANUFACTURERS
  - A. Subject to compliance with through penetration firestop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:
    - 1. W. R. Grace "Flamesafe", 1330 Industry Rd., Hatfield, PA (800-334-8796)
    - 2. 3M Fire Protection Products, St Paul, Minnesota
    - 3. Hilti Inc., Plano, TX, 800-879-8000, www.us.hilti.com

## 2.7 MATERIALS

- A. Intumescent Firestop Sealants
  - 1. FlameSafe® FS 1900 Intumescent Elastomeric Sealant
  - 2. 3M Fire Barrier Caulk CP25WB+
- B. Endothermic Water-Based Sealants
  - 1. FlameSafe® FS 900 Endothermic Sealant
  - 2. 3M Interam FireDam 150 Caulk
- C. Elastomeric Firestop Coating
  - 1. FlameSafe® FS2900 Intumescent Elastomeric Firestop Coating
  - 2. 3M FireDam Spray
- D. Intumescent Firestop Putty
  - 1. FlameSafe® FSP 1000 Intumescent Putty
  - 2. 3M Fire Barrier Moldable Putty+
- E. Firestop Mortar
  - 1. FlameSafe® Mortar Seal
  - 2. 3M Fire Barrier Mortar
- F. Firestop Bags
  - 1. FlameSafe® Intumescent Firestop Bags
- G. Firestop Sleeves
  - 1. FlameSafe® Intumescent Sleeve
- H. Wrap Strips
  - 1. FlameSafe® Intumescent Wrap Strip
  - 2. 3M Fire Barrier FS-195+ Wrap/Strip
- I. Restraining Collars
  - 1. FlameSafe® FSRC 100/ FSRC 150 Restraining Collars
  - 2. 3M Fire Barrrier RC-1 Restricting Collar
- J. Composite Sheet

1. 3M Fire Barrier CS-195+ Composite Sheet

## K. Accessories

- 1. Forming or Damming Materials as specified by the manufacturer.
- 2.8 RE-PENETRABLE, ROUND CABLE MANAGEMENT DEVICES: for use with new or existing cable bundles penetrating gypsum or masonry walls, the following products are acceptable:
  - A. Hilti Speed Sleeve (CP 653) with integrated smoke seal fabric membrane.
  - B. Similar products by FlameSafe or 3M Fire Barrier

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine adjoining construction and the conditions under which the work is to be completed. Do not proceed with work until any unsatisfactory conditions detrimental to the proper and timely completion of the work have been corrected.
- B. Verify adjacent materials are clean, dry and ready to receive installation.
- C. Verify that openings and items (penetrations) passing through them are ready to receive the work of this section.
- D. Verify that field dimensions are as shown on the drawings and as recommended by the manufacturer.

## 3.2 PREPARATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion. Do not proceed until unsatisfactory conditions have been corrected.
- B. Verify penetrations are properly sized and in suitable condition for application of materials.
- C. In accordance with manufacturer's requirements for proper installation, remove any incompatible materials (dirt, debris, greases, oils and solvents) which may inhibit the adhesion or physical properties of the firestop products.
- D. Beginning of installation means acceptance of existing conditions.
- E. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping/sealing products

### 3.3 INSTALLATION

- A. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- C. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.

D. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector

### 3.4 INSTALLATION

- A. Coordinate with fire protection and other trades to assure that all pipe, conduit, cable and other items which penetrate fire rated and/or smoke wall construction have been permanently installed prior to installation of firestops and smoke seals. Schedule and sequence work to assure that partitions and other construction that would conceal penetrations are not erected prior to the installation of firestop, firesafing and smoke seals.
- B. Firestop System installation must meet requirements of ASTM E 814 or UL 1479 tested assemblies that provide a fire rating equal to that of the construction being penetrated
- C. Apply firestops and smoke seals at all locations as required by national, municipal and local governing laws and codes, per approved submittals referenced above.
- D. Apply firestopping materials only when the temperature of the surfaces to be filled and the surrounding air temperature complies with the manufacturer's printed instructions.
- E. Comply with manufacturer's instructions for installation of through-penetration materials.
- F. Personal safety gear shall be utilized in accordance with manufacturer's instructions, material and environmental considerations.
- G. For applications not covered by the literature or installation guide/drawing. Call the manufacturer's technical service engineer for assistance.

### 3.5 FIELD QUALITY CONTROL

- A. Verify that system(s) are installed in all specified and/or indicated locations in rated assemblies.
- B. Verify that proper, specified firestopping materials are used in the firestop system and that system is installed in strict accordance with the latest independent testing agency or manufacturer's latest published requirements.
- C. Where system design permits, remove damming or support materials only after it has been determined that the firestop materials have fully cured or dried.
- D. Install any covering materials or finish as per design requirements and manufacturer's instructions.
- E. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.
- F. Inspection of through-penetration firestopping and sealing shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standards.
- G. Do not proceed to enclose firestopping with other construction until applicable code building inspectors, including fire department inspectors, have inspected the work and given approval to close the work.
- H. Where necessary, repairs shall be made, and repaired installations shall be re-inspected.
- I. Protect materials from damage on surfaces subject to traffic.
- 3.6 INDENTIFICATION & DOCUMENTATION

- A. After installation, properly identify all firestop systems. Identification shall occur at location where system has been installed and shall include:
  - 1. Identify the firestopping system that has been installed as being a "Rated Through-Penetration Firestop System - Do Not Disturb."
  - 2. Use label minimum 3" x 5", yellow and black OSHA colors with manufacturers; and building owner representative and/or contractor clearly identified.
- B. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project. Documentation to include through penetration and construction joints. Provide documentation in line and coordinated with the manufacturer's specifications for Identification & Documentation forms.
- C. Copies of these documents are to be provided to the general contractor at the completion of the project.
- D. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
  - 1. The words: "Warning -Through Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's Name, address, and phone number.
  - 3. Through-Penetration firestop system designation of applicable testing and inspecting agency.
  - 4. Date of Installation.
  - 5. Through-Penetration firestop system manufacturer's name.
  - 6. Installer's Name.
  - 7. Labels shall have a unique QR code for each penetration which can be scanned by firestop documentation software to quickly identify the penetration attributes.

## 3.7 CLEAN-UP

- A. Remove excess firestopping materials from surfaces not required to be firestopped.
- B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.
- C. Clean application equipment in water immediately after use.

END OF SECTION 07 84 00

SECTION 07 92 00 - JOINT SEALANTS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes: The extent of each type of joint sealer is indicated. Provide "sealant" for all exterior joints, certain indicated interior joints, and where "mastic" is indicated. Provide "calking" at all remaining interior joints.
- B. The required applications include, but are not limited to the following:
  - 1. Flashing and coping joints.
  - 2. Miscellaneous concrete construction joints.
  - 3. Masonry control joints.
  - 4. Floor (interior) joints.
  - 5. Partition and ceiling joints.
  - 6. Joints at openings and indicated frames or subframes.
  - 7. Equipment
  - 8. Security sealant.

#### 1.3 PRE-INSTALLATION MEETING:

- A. Pre-Installation Meeting: Meet at the project well in advance of the time scheduled for work, (a minimum of one week), and review requirements for the work and conditions which could possibly interfere with successful performance of the work. Require all parties concerned with the work, or required to coordinate with it, or to protect it thereafter, to attend the meeting, including:
  - 1. Owner or Representative
  - 2. General Contractor
  - 3. Installer
  - 4. Manufacturer(s) Representatives
  - 5. Architect

#### 1.4 QUALITY ASSURANCE:

- A. At the Owner's option, testing of depth of joint material may be undertaken to ensure compliance with the specification and conformance to manufacturer's specifications and recommendations for joint design. If the joint fails to comply with design requirements, the Contractor shall pay for the cost of testing and replacement of all affected joints.
- 1.5 SUBMITTALS:

- A. Product Data:
  - 1. For information only, submit copies of the manufacturer's specifications, recommendations and installation instructions for each type of material required. Include manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown.
- B. Samples:
  - Submit samples of each color required (except black) for each type of joint sealer exposed to view. Install sample between two strips of material similar to or representative of typical surfaces where sealer will be used, held apart to represent typical joint widths. Samples will be reviewed for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
- C. Guarantee:
  - 1. Submit copies of written two-year guarantee agreeing to repair or replace joint sealers which fail to perform as air-tight and water-tight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.
    - a. Provide a guarantee signed by the Installer and Contractor.

## 1.6 JOB CONDITIONS:

- A. Examine the joint surfaces and backing, and their anchorage to the structure, and the conditions under which the joint sealer work is to be performed. Do not proceed with the joint sealer work until unsatisfactory conditions have been corrected.
- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with the work only when weather conditions are favorable for proper cure and development of high early bond strength. Where joint width is affected by ambient temperature variations, install elastomeric sealants when temperatures are in the lower third of manufacturer's recommended installation temperature range.

## PART 2 - PRODUCTS

- 2.1 MATERIALS, GENERAL:
  - A. Colors: For exposed materials provide color as indicated or, if not indicated, as selected from manufacturer's standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.
  - B. Hardness: As recommended by manufacturer for application shown.

- C. Modulus of Elasticity: Provide the lowest available modulus of elasticity, which is consistent with exposure to weathering, indentation, vandalism, abrasion, support of loading, and other requirements.
- D. Compatibility: Before purchase of each required material, confirm its compatibility with each material it will be exposed to in the joint system.
- E. Size and Shape: As shown or, if not shown, as recommended by the manufacturer for the type and condition of joint, and for the indicated joint performance or movement.
- F. Grade of Sealant: For each application, provide the grade of sealant (non-sag, self-leveling, no-track, knife grade, preformed, etc.) recommended by the manufacturer for the particular condition of installation (location, joint shape, ambient temperature, and similar conditions), to achieve the best possible overall performance. Grades specified herein are for normal conditions of installation.
- 2.2 SEALANTS (See Sealant Schedule at end of Section for specific use of sealants.)
  - A. Urethanes:
    - 1. Type "A1": Two-Part Urethane: Self-Leveling, ASTM C920, Type M, Grade P, Class 25. (Fed. Spec. TT-S-00227E Type I, Class A.)
      - a. Chem-Calk CC-550, by Bostik.
      - b. Vulkem 245, by Tremco.
      - c. Vulkem 255, Wide-Joint, by Tremco.
      - d. NR-200 Urexpan, by Pecora Corporation.
      - e. Sikaflex-2c NS/SL, by Sika Corporation.
      - f. SL-2, by Sonneborn
    - 2. Type "A2": Two-Part Urethane: Non-Sag, ASTM C920, Type M, Grade NS, Class 25. (Fed. Spec. TT-S-00227E Type II, Class A.)
      - a. Chem-Calk 500, by Bostik.
      - b. Vulkem 227, by Tremco.
      - c. Dynatrol II, by Pecora Corporation.
      - d. Sikaflex-2c NS/SL, by Sika Corporation.
      - e. Sonolastic NP 2, by Sonneborn Building Products, ChemRex Inc.
      - f. Dymeric, by Tremco
    - 3. Type "A3": One-Part Urethane: Self-Leveling, ASTM C920, Type S, Grade P, Class 25. (Fed. Spec. TT-S-00230C Type I, Class A.)
      - a. Vulkem 45, by Tremco.
      - b. Urexpan NR-201, by Pecora Corporation.
      - c. Sonolastic SL1, by Sonneborn Building Products, ChemRex Inc.
    - 4. Type "A4": One-Part Urethane: Non-Sag, ASTM C920, Type S, Grade NS, Class 25. (Fed. Spec. TT-S-00230C Type II, Class A.)
      - a. Chem-Calk 900, by Bostik.
      - b. Vulkem 116, by Tremco.
      - c. Sonolastic NP I, by Sonneborn Building Products, ChemRex Inc.
      - d. Dymonic, by Tremco.

- B. Silicones:
  - 1. Type "B1": One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25. Vertical Surfaces Only.
    - a. 795 Silicone Structural Glazing, Glazing, and Weatherproofing Sealant, by Dow Corning.
    - b. 864 Architectural Silicone, by Pecora Corporation.
    - c. Sonolastic 150 Silyl Terminated polyether, by Sonneborn
    - d. Spectrem 3, by Tremco.
  - 2. Type "B2": One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25. Vertical Surfaces Only.
    - a. 795 Silicone Structural Glazing, Glazing, and Weatherproofing Sealant, by Dow Corning. (colors only)
    - b. 999-A, Dow Corning.
    - c. Construction 1200 Sealant, General Electric Company.
    - d. Sonolastic 150 Silyl Terminated polyether, by Sonneborn (Not for wet glazing)
    - e. Spectrem 2, by Tremco.
  - 3. Type "B3": One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25. Vertical Surfaces Only.
    - a. 795 Silicone Structural Glazing, Glazing, and Weatherproofing Sealant, by Dow Corning. (colors only)
    - b. Construction 1200 Sealant, General Electric Company.
    - c. 999-A, Dow Corning.
    - d. 864 Architectural Silicone, by Pecora Corporation. (colors only)
    - e. Sonolastic 150 Silyl Terminated polyether, by Sonneborn
    - f. Spectrem 1, by Tremco.
  - 4. Type "B4": One-Part Silicones: ASTM C920, Type S, Grade NS, Class 25.
    - a. 786 Mildew Resistant Silicone Sealant, Dow Corning.
    - b. SCS 1700 Sanitary Sealant, General Electric.
    - c. 898 Silicone Sanitary Sealant, Pecora Corporation.
    - d. Omniseal or Omniplus (Sanitary applications), by Sonneborn
    - e. Tremsil, by Tremco.
- C. Acrylics, Latex: (For interior use only.)
  - 1. Type "C1": One-Part Acrylic Latex, Non-Sag, ASTM-C-834-76.
    - a. Chem-Calk 600, by Bostik.
    - b. LC-130, by MACCO Adhesives, The Glidden Company.
    - c. Easa-ply ALS, by W. R. Meadows, Inc.
    - d. AC-20+Silicone Acrylic Latex, by Pecora Corporation.
    - e. Sonolac, Sonneborn Building Products, ChemRex Inc.
- D. Acoustical Sealants:
  - 1. Type "D1":
    - a. AC-20 FTR Acoustical and Insulation Sealant, by Pecora Corporation.

- b. 60+ Unicrylic, by Pecora Corporation.
- c. Sheetrock Acoustical Sealant, by United States Gypsum.
- E. Butyls:
  - 1. Type "E1": One-Part Butyl, Non-Sag, FS TT-S-1657.
    - a. Chem-Calk 300, by Bostik.
    - b. BC-158 Butyl Rubber, by Pecora Corporation. (ASTM C1085)
- F. Preformed Compressible & Non-Compressible Fillers:
  - 1. Type "F1": Backer Rod Closed cell polyethylene foam:
    - a. HBR Backer Rod, by Nomaco.
    - b. #92 Greenrod, by Nomaco.
    - c. Sonolastic Closed-Cell Backer Rod, Sonneborn Building Products, ChemRex Inc.
    - d. Soft Cell Backer Rod (Non-gassing), by Sonneborn.
  - 2. Type "F2": Backer Rod Open cell polyurethane foam:
    - a. Denver Foam, by Backer Rod Mfg. Inc.
    - b. Foam Pack II, by Nomaco.
  - 3. Type "F3": Neoprene compression seals:
    - a. WE, WF, and WG Series, by Watson Bowman & Acme Corp.
    - b. Will-Seal 150 Precompressed Expanding Foam Sealants, by Will-Seal, a Division of Illbruck.
  - 4. Type "F4": Butyl Rod:
    - a. Kirkhill Rubber Co. (714)529-4901.
  - 5. Type "G1":
    - a. Bond Breaker Tape: Polyethylene tape of plastic as recommended by sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate of joint filler must be avoided for proper performance of sealant

## 2.3 PAVING SEALANTS:

- A. Type "P1": Two-Part Urethane: Self-Leveling, ASTM C920, Type M, Grade P, Class 25.
  - 1. Vulkem 202, by Tremco. (Jet Fuel Resistant) (FS SS-S-200D, Type H only)
  - 2. NR-300 Urexpan, by Pecora Corporation. (FS SS-S-200E)
  - 3. Sonomeric 2, by Sonneborn
- B. Type "P2": One-Part Urethane: Self-Leveling, ASTM C920, Type S, Grade P, Class 25.
  - 1. Sonomeric 1 Sealant, by Sonneborn Building Products, ChemRex Inc. (FS SS-S-200E)
  - 2. Vulkem 45, by Tremco.
- C. Type "P3": Epoxy Joint Filler (Heavy Traffic Areas)

1. Epolith P or Epolith G, by Sonneborn

#### 2.4 SECURITY SEALANT

- A. Manufacturer: Pecora Corporation, 165 Wambold Road, Harleysville, PA 19438, Phone: 215-723-605, 800-523-6688, Fax: 215-721-0286, Website:www.pecora.com.
- B. Product: Dynapoxy EP-1100, a two-part, non-sag chemically curing epoxy adhesive/sealant, specially formulated for security areas and other areas where tenacious bonding properties and durability are required.

#### 2.5 MISCELLANEOUS ACCESSORIES:

- A. Joint Primer/Sealer: Provide the type of joint primer/sealer recommended by the sealant manufacturer for the joint surfaces to be primed or sealed.
- B. Bond Breaker Tape: Polyethylene tape or other plastic tape recommended by the sealant manufacturer to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.
- C. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam; or other flexible, permanent, durable non-absorptive material as recommended by the sealant manufacturer.

## PART 3 - EXECUTION

- 3.1 Manufacturer's Instructions:
  - 1. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.
  - B. Joint Preparation:
    - 1. Clean joint surfaces immediately before installation of sealant or calking compound. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant or calking compound. Etch concrete and masonry joint surfaces and roughen vitreous or glazed joint surfaces as recommended by sealant manufacturer.
    - 2. Prime or seal the joint surfaces where recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

#### 3.2 INSTALLATION:

- A. Set joint filler units at proper depth or position in the joint to coordinate with other work, including the installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between the ends of joint filler units.
- B. Install sealant backer rod for liquid elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.

- C. Install the bond breaker tape where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- D. Employ only proven installation techniques, which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Fill the sealant rabbet to a slightly concave surface, between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- E. Install sealants to depths recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
  - 1. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.
  - 2. For joints sealed with non-elastomeric sealants and calking compounds, fill joints to a depth in the range of 75% to 125% of joint width.
  - 3. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
  - 4. Do not overheat hot-applied sealants.
  - 5. Recess exposed edges of joint fillers slightly behind adjoining surfaces, so compressed units will not protrude from the joint.

# 3.3 CURE AND PROTECTION:

A. Cure sealants and calking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise the Contractor of procedures required for the cure and protection of joint sealers during the construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at the time of acceptance.

## 3.4 SEALANT SCHEDULE

- A. Exterior Joints:
  - 1. Perimeters of exterior openings where frames and other penetrations meet exterior facade of building: precast concrete, brick, CMU, reinforced concrete.
    - a. Sealant Type A2
    - b. Sealant Type B1 (for prefinished materials only)
  - 2. Expansion and control joints in exterior surfaces of unit masonry walls.
    - a. Sealant Type A2
  - 3. Coping joints, coping-to-facade joints, cornice and wash, or horizontal surface joints not subject to foot or vehicular traffic.
    - a. Sealant Type A2
    - b. Sealant Type A4
    - c. Sealant Type B1 (for prefinished materials only)
  - 4. Exterior joints in horizontal wearing and non-wearing surfaces.

- a. Sealant Type A1
- b. Sealant Type A3
- c. Backer Material Type F1
- 5. Setting bed for threshold and saddles.
  - a. Sealant Type E1
- 6. Painted metal lap or flashing joints.
  - a. Sealant Type B1
- B. Interior Joints:
  - 1. Seal interior perimeters of exterior openings.
  - 2. Expansion and control joints on interior of exterior cast-in-place concrete walls.
  - 3. Expansion and control joints on interior of exterior surfaces of masonry walls.
  - 4. The perimeters of the interior are hollow metal and aluminum frames.
  - 5. Exposed interior control joints in drywall and concealed joints.
    - a. Sealant Type C1
    - b. Sealant Type D1
  - 6. Joints of underside of precast beams or planks.
    - a. Sealant Type A2
    - b. Sealant Type A4
  - 7. Joints at tops of non-load bearing masonry walls at underside of cast-in-place concrete.
    - a. Sealant Type A2
    - b. Sealant Type A4
  - 8. Perimeter of bath fixtures: sinks, urinals, water closets, basins, vanities, etc.
    - a. Sealant Type B4
  - 9. Interior expansion and control joints in floor surfaces exposed to foot traffic.
    - a. Sealant Type A1
    - b. Sealant Type A3
    - c. Backer Material Type F1
  - 10. Painted metal lap joints.
    - a. Sealant Type B1
- C. Glazing:
  - 1. Structural Glazing.
    - a. Sealant Type B2
    - b. Sealant Type B3

- 2. General Purpose Glazing.
  - a. Sealant Type B3
- 3. End Damming.
  - a. Sealant Type E1

END OF SECTION 07 90 00

# SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Section Includes:
  - 1. Standard hollow metal door frames.
  - 2. Custom hollow metal frames for vision panels.

## B. Related Sections:

- 1. Division 08 Section "Door Hardware" for door hardware for hollow metal doors.
- 2. Division 08 Glass and Glazing.

## 1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.
- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.
- C. Custom Hollow Metal Work: Hollow metal work fabricated according to ANSI/NAAMM-HMMA 861.

## 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door design.
  - 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.

- 6. Details of anchorages, joints, field splices, and connections.
- 7. Details of accessories.
- 8. Details of moldings, removable stops, and glazing.
- 9. Details of conduit and preparations for power, signal, and control systems.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification:
  - 1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 125 mm).
- E. Other Action Submittals:
  - 1. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with door hardware schedule.

## 1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
  - 1. Provide additional protection to prevent damage to the finish of factory-finished units.
- B. Temporary spreader bars are intended for shipping and handling purposes only.
- C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- D. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
  - 1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

# 1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

#### 1.8 COORDINATION

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

## PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers listed below produce either standard or custom hollow metal work unless otherwise indicated. Verify specific capabilities with individual manufacturers.
  - 1. Amweld Building Products, LLC.
  - 2. Benchmark; a division of Therma-Tru Corporation.
  - 3. Ceco Door Products; an Assa Abloy Group company.
  - 4. Curries Company; an Assa Abloy Group company.
  - 5. Deansteel Manufacturing Company, Inc.
  - 6. Fleming Door Products Ltd.; an Assa Abloy Group company.
  - 7. Habersham Metal Products Company.
- B. The manufacturer listed in first subparagraph below produces only custom hollow metal work.
  - 1. Karpen Steel Custom Doors & Frames.
  - 2. Kewanee Corporation (The).
  - 3. Mesker Door Inc.
  - 4. Pioneer Industries, Inc.
  - 5. Security Metal Products Corp.
  - 6. Steelcraft; an Ingersoll-Rand company.
  - 7. Windsor Republic Doors.
  - 8. <Insert manufacturer's name>.

# 2.2 MATERIALS

A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 (ZF120) metallic coating.
- C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- D. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool with 6- to 12-lb/cu. ft. (96- to 192-kg/cu. m) density; with maximum flame-spread and smoke-development indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- E. Glazing: Comply with requirements in Division 08 Section "Glazing."

#### 2.3 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Face-welded frames are welded only along the face and not along the soffit, stops, and rabbets. Fully welded frames are completely welded along all elements.
- C. Interior Frames: Fabricated from cold-rolled steel sheet.
  - 1. Fabricate frames with mitered or coped corners.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

## 2.4 CUSTOM HOLLOW METAL FRAMES

- A. General: Fabricate frames of construction indicated. Close contact edges of corner joints tight with faces mitered and stops butted or mitered. Continuously weld faces and soffits and finish faces smooth. Comply with ANSI/NAAMM-HMMA 861.
  - 1. Fabricate frames with mitered or coped corners.
  - 2. Frames for Vision Panels: 0.053-inch- (1.3-mm-) minimum thick steel sheet.
- B. Exterior Frames: Formed from metallic-coated steel sheet.
- C. Interior Frames: Fabricated from cold-rolled steel sheets.
- D. Hardware Reinforcement: Fabricate according to ANSI/NAAMM-HMMA 861 with reinforcing plates from same material as frame.
- E. Head Reinforcement: Provide minimum 0.093-inch- (2.3-mm-) thick, steel channel or angle stiffener for opening widths more than 48 inches (1219 mm).

## 2.5 FRAME ANCHORS

- A. Jamb Anchors:
  - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames.

2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

## 2.6 STOPS AND MOLDINGS

A. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

## 2.7 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

# 2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in [SDI 117] [ANSI/NAAMM-HMMA 861].
- C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
  - 2. Vision Panel and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  - 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
- D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
  - 1. Locate hardware as indicated, or if not indicated, according to [ANSI/SDI A250.8] [ANSI/NAAMM-HMMA 861].
  - 2. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
  - 3. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
- E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

- 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.
- 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
- 3. Provide fixed frame moldings on the outside of exterior and on secure side of interior doors and frames.
- 4. Provide loose stops and moldings on the inside of hollow metal work.
- 5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

#### 2.9 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
  - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- B. Factory-applied finishes are not covered by ANSI/NAAMM-HMMA 861.

## PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Tolerances in first paragraph below are required by ANSI/NAAMM-HMMA 861.
- C. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

- 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
- 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
- 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

#### 3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with [ANSI/SDI A250.11] [HMMA 840].
  - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. Install frames with removable glazing stops located on secure side of opening.
    - b. Install door silencers in frames before grouting.
    - c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - d. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - e. Field apply bituminous coating to backs of frames that are filled with grout containing anti-freezing agents.
  - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post installed expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.
  - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
- C. Fastening:
  - 1. In-Place Gypsum Board Partitions: Secure frames in place with post installed expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  - 2. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend the top of struts to provide flush contact for securing the supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.

- 3. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

## 3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Retain one of two paragraphs below.
- D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- E. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

## SECTION 08 71 00 - DOOR HARDWARE

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SECTION INCLUDES

A. Furnish and deliver all finish hardware necessary for all doors, also hardware as specified herein and as enumerated in hardware sets and as indicated and required by actual conditions at the building. The hardware shall include the furnishing of all necessary screws, bolts, expansion shields, drop plates, and all other devices necessary for the proper application of the hardware.

## 1.3 RELATED SECTIONS

- A. Division 06 Wood, Plastics, and Composites
- B. Section 08 14 16 Flush Wood Doors
- C. Division 26 Electrical
- D. Specific Omissions: Hardware for the following is specified or indicated elsewhere, unless specifically listed in the hardware sets:
  - 1. Windows.
  - 2. Cabinets of all kinds, including open wall shelving and locks.
  - 3. Signs, except as noted.
  - 4. Toilet accessories of all kinds including grab bars and coat hooks.
  - 5. Overhead doors (except cylinders where scheduled).

## 1.4 REFERENCES

- A. International Code Congress (ICC)/American National Standards Institute (ANSI):
  - 1. ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities.
  - 2. ANSI/BHMA A156.1 A156.24 Standards for Hardware and Specialties.
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 101 Life Safety Code
- C. Underwriters Laboratories, Inc. (UL):
  - 1. UL 10C Positive Pressure Test of Fire Door Assemblies
  - 2. UL 305 Panic Hardware
- D. Applicable state and local building codes.
- E. Accessibility
  - 1. ADA Americans with Disabilities Act
- F. Door and Hardware Institute (DHI):

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- 1. Sequence and Format for the Hardware Schedule.
- 2. Recommended Locations for Builders Hardware

# 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Include manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
  - 1. Type, style, function, size, and finish of each hardware item.
  - 2. Name and manufacturer of each item.
  - 3. Fastenings and other pertinent information.
  - 4. Location of each hardware set cross-referenced to indications on Drawings.
  - 5. Explanation of all abbreviations, symbols, and codes contained in schedule.
  - 6. Mounting locations for hardware.
  - 7. Mounting type for closers.
  - 8. Door and frame sizes, materials, degree of opening, handing, and fire/smoke rating.
  - 9. Name and phone number for the local manufacturer's representative for each product.
- D. Key Schedule: After a keying meeting between representatives of the Owner, Architect, and the hardware supplier, provide a keying schedule, listing the levels of keying, as well as an explanation of the key system's function, the key symbols used, and the door numbers controlled. This schedule can be submitted as a part of the hardware schedule or as a separate schedule.
- E. Samples: If requested by the Architect, submit samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule.
  - 1. Samples will be returned to the supplier in like-new condition. Units that are acceptable may, after final check of operations, be incorporated in the Work, within limitations of key coordination requirements.
- F. Templates: After final approval of the hardware schedule, provide templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware.
- G. Wiring Diagrams: After final approval of the hardware schedule, submit wiring diagrams as required for the proper installation of all electrical, electro-mechanical, and/or electro-magnetic products.
- H. Operations and Maintenance Data: Provide in accordance with Section 01 78 23 and include the following:
  - 1. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - 2. Catalog pages for each product.
  - 3. Name, address, and phone number of local representative for each manufacturer.
  - 4. Parts list for each product.
  - 5. Copy of final approved hardware schedule, edited to reflect "As installed."
  - 6. Copy of final keying schedule.

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- 7. As installed "Wiring Diagrams" for each opening connected to power, both low voltage and 110 volts.
- 8. One (1) complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- 9. Copy of warranties including appropriate reference numbers for manufacturers to identify the project.

# 1.6 QUALITY ASSURANCE

- A. Substitutions: Submit substitutions in accordance with Division 01.
- B. Supplier Qualifications: A recognized architectural hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an accredited Architectural Hardware Consultant (AHC), who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work for consultation.
- C. Product Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- D. Supplier Single Source Responsibility: Procure hardware for all doors from a single supplier.
- 1.7 DELIVERY, STORAGE AND HANDLING
  - A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
  - B. Each article of hardware shall be individually packaged in manufacturer's original packaging.
  - C. Contractor will provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items so that completion of the Work will not be delayed by hardware losses both before and after installation.
  - D. Items damaged in shipment shall be replaced promptly and with proper material and paid for by whomever did the damage or caused the damage to occur.
  - E. All the hardware shall be handled at this project in a manner to avoid damage, marring or scratching. Any irregularities that occur to the hardware after it has been delivered to the project shall be corrected, replaced or repaired by the Contractor at their expense. All hardware items shall be protected against malfunction due to paint, solvent, cleanser or any chemical agent.
  - F. No direct shipments will be allowed unless approved by the Contractor.
- 1.8 WARRANTY
  - A. Starting date for warranty periods to be date of manufacture of that hardware item.
  - B. No liability is to be assumed where damage or faulty operation is due to improper installation, improper usage or abuse.
  - C. Provide guarantee from hardware supplier as follows:

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- 1. Hinges: Limited Lifetime.
- 2. Closers: Limited Lifetime.
- 3. All other Hardware: One (1) year.
- D. Products judged to be defective during the warranty period shall be replaced or repaired in accordance with the manufacturer's warranty, at no additional cost to the Owner.

## 1.9 MAINTENANCE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. Approval of manufacturers other than those listed shall be in accordance with Paragraph 1.6A.
- B. Note that even though an acceptable substitute manufacturer may be listed, the product must provide all the functions and features of the specified product or it will not be approved.
- C. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- D. Where the exact types of hardware specified are not adaptable to the finished shape or size of the members requiring hardware, furnish suitable types having as nearly as possible the same operation and quality as the type specified, subject to Architect's approval.

## 2.2 MATERIALS

- A. Fasteners:
  - 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
  - 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
  - 3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent that no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely.
  - 4. All hardware shall be installed with the fasteners provided by the hardware manufacturer.

## 2.3 HINGES

- A. Provide five-knuckle, concealed bearing hinges of type, material, and height as outlined in the following guide for this specification:
- B. 1-3/4 inch thick doors, up to and including 36 inches wide:

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- 1. Exterior: standard weight, stainless steel, 4-1/2 inches high
- 2. Interior: standard weight, steel, 4-1/2 inches high
- C. 1-3/4 inch thick doors over 36 inches wide:
  - 1. Exterior: heavy weight, stainless steel, 5 inches high
  - 2. Interior: heavy weight, steel, 5 inches high
- D. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.
- E. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Steel Hinges: Steel pins
  - 2. Non-Ferrous Hinges: Stainless steel pins
  - 3. Out-Swinging Exterior Doors: Non-removable pins
  - 4. Out-Swinging Interior Lockable Doors: Non-removable pins
  - 5. Interior Non-lockable Doors: Non-rising pins
- F. The width of hinges shall be 4-1/2 inches at 1-3/4 inch thick doors. Adjust hinge width as required for door, frame, and/or wall conditions to allow proper degree of opening.
- G. Acceptable manufacturers and/or products: Stanley CB series, Hager, and Bommer.
- 2.4 CARD READER WIRELESS LOCKSET
  - A. Provide Schlage Engage Wireless Lever Lockset as specified.
  - B. Basis of design is Schlage NDE Engage, substitutions only as approved.
- 2.5 DOOR CLOSERS
  - A. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1-1/2 inch diameter.
  - B. Provide hydraulic fluid requiring no seasonal closer adjustment. Fluid shall be fireproof and shall pass the requirements of the UL10C "positive pressure" fire test.
  - C. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
  - D. Provide closers with heavy-duty forged forearms for parallel arm closers.
  - E. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
  - F. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other finish hardware items interfering with closer mounting.
  - G. Closers shall be mounted with thru-bolts only.

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- H. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- I. Door closers meeting this specification: Dormakaba QDC100 Series, LCN 4040, and Sargent 280.

# 2.6 PROTECTION PLATES

- A. Provide kick plates, and mop plates, minimum of 0.050 inch thick as scheduled. Furnish with machine or wood screws, finished to match plates. Sizes of plates shall be as follows:
  - a. Kick Plates 8 inches or 18 inches high (as scheduled) x 2 inches less width of door on single doors, 1 inch less width of door on pairs
- B. Acceptable manufacturers and/or products: Trimco, Don-Jo Mfg., Burns.

## 2.7 DOOR STOPS

- A. Provide door stops for all doors in accordance with the following requirements:
  - 1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
  - 2. Where wall stops cannot be used, provide dome type floor stops of the proper height.
  - 3. At any opening where a wall or floor stop cannot be used, a medium duty surface mounted overhead stop shall be used.
- B. Acceptable manufacturers and/or products: Trimco, Don-Jo Mfg., Burns.
- 2.8 Thresholds, Seals, Door Sweeps, Automatic Door Bottoms, and Gasketing
  - A. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items as closely as possible. Size of thresholds shall be as follows:
     1. Bumper Seal Thresholds 1/2 inch high x jamb depth x door width
  - B. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
  - C. Acceptable manufacturers and/or products: National Guard, Zero, Reese.

#### 2.9 FINISHES

- A. Provide finishes as specified in hardware sets.
- 2.10 CYLINDERS AND KEYING
  - A. Provide a key system conforming to the Owner's existing SFIC Best key system and the following requirements:
  - B. Provide removable core cylinders at all keyed devices. The manufacturer's agent, accompanied by the Owner or Owner's security agent, shall install permanent keyed cores upon completion of the project. The temporary construction cores are to be returned to the manufacturer.

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- C. The manufacturers' agent, shall meet with Owner and Architect to review keying requirements and lock functions prior to ordering finish hardware. Submit a keying schedule to Architect for approval.
- D. Provide keys as follows:
  - 1. Ten grand master keys for each set.
  - 2. Ten master keys for each set.
  - 3. Three keys per core and/or cylinder.
  - 4. Two construction core control keys
  - 5. Two permanent core control keys
  - 6. Six construction master keys for each type (Contractor is to provide one set of construction keys to Architect)
- E. Visual key control:
  - 1. Keys shall be stamped with their respective key set number and stamped "DO NOT DUPLICATE".
  - 2. Grand master and master keys shall be stamped with their respective key set letters.
  - 3. Do not stamp any keys with the factory key change number.
  - 4. Do not stamp any cores with key set on face (front) of Core. Stamp on back or side of cores so not to be visible when core is in cylinder.
- F. Deliver grand master keys, master keys, change keys, and/or key blanks from the factory or directly to the Owner in sealed containers, return receipt requested. Failure to comply with these requirements may be cause to require replacement of all or any part of the keying system that was compromised at no additional cost to the Owner.
- G. Approved products: Match Owner's existing Best system.
- 2.11 ELECTRIFIED HARDWARE
  - A. Manufacturers:
    - 1. SDC.
    - 2. Precision
    - 3. Schlage Electronics
- 2.12 Properties:
  - A. Latch Retraction Retro-fit Kit.
    - 1. Provide motorized latch retraction kit compatible with existing to remain exit device.
      - a. Listed by UL and ULC.
  - B. Power Transfers:
    - 1. Armored Loop Type.
      - a. Listed by UL and ULC.
  - C. Products:
    - 1. LR100 Latch Retraction Kit.
    - 2. EPT-2.

## PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of any hardware, examine doors, frames, walls and related items for conditions that would prevent proper installation of finish hardware. Correct defects prior to proceeding with installation.
- B. Pre-Installation Conference: Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective products. A letter of compliance, indicating when the meeting was held and who was in attendance, shall be sent to Architect and Owner.

#### 3.2 INSTALLATION

- A. Hardware shall be installed by qualified tradesmen skilled in application of commercial grade hardware. For technical assistance if necessary, installers may contact manufacturer's representative for the item in question, as listed in the hardware schedule.
- B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations, using only the fasteners provided by the manufacturer.
- D. Do not install surface mounted items until finishes have been completed on the substrate. Protect installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- F. Operating parts shall move freely and smoothly without binding, sticking, or excessive clearance.
- G. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant complying with requirements specified in Section 07 92 00.
- 3.3 ADJUSTING, CLEANING AND DEMONSTRATING
  - A. Adjust and check each operating item of hardware and each door, to insure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly.
  - B. Where door hardware is installed more than one (1) month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make a final check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
  - C. Clean adjacent surfaces soiled by hardware installation. Remove bulk trash form the building, clean up any dust/debris caused by the installation of hardware.
  - D. Instruct Owner's personnel in the proper adjustment, lubrication, and maintenance of door hardware and hardware finishes.
- 3.4 FIELD QUALITY CONTROL

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- A. At completion of the project, a qualified factory representative for the manufacturers of locksets, closers, and exit devices shall inspect installations of their products. After the inspections, a letter shall be sent to the Architect reporting on conditions, verifying that their respective products have been properly installed and adjusted.
- B. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the installer, accompanied by representatives of the manufacturers of latchsets and locksets, door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:
  - 1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
  - 2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
  - 3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
  - 4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

## 3.5 PROTECTION

A. Provide for the proper protection of items of hardware until Owner accepts the project as complete. Damaged or disfigured hardware shall be replaced or repaired by the responsible party.

## 3.6 HARDWARE SCHEDULE

- A. Provide hardware for each door to comply with requirements of hardware set numbers indicated in door schedule, and in the following schedule of hardware sets.
- B. It is intended that the following schedule includes all items of finish hardware necessary to complete the work. If a discrepancy is found in the schedule, such as a missing item, improper hardware for a frame, door or fire codes, the preamble will be the deciding document.
- C. Hardware sets:

## HARDWARE SETS:

Set #01 – MAIN ENTRY EXTERIOR			
DO	OR 100.1, 106.2, 202.2		
1	Latch Retraction Kit	LR100 Series	SDC
1	Armored Transfer Loop	EPT-2	PRE
1	Door Contact	Specified/Provided Elsewhere	
1	Card Reader	Specified/Provided Elsewhere	
1	Controller	Specified/Provided Elsewhere	
1	Power Supply	Specified/Provided Elsewhere	

Remainder of hardware existing to remain. Verify manfuacturer of existing exit device manufacturer prior to ordering latch retraction retro-fit kit.

Set #02 – EXTERIOR	
DOOR 105.1, 106.3	
1 Latch Retraction Kit	LR100 Series

## SDC

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1	Armored Transfer Loop	EPT-2		PRE
1	Door Contact	Specified/Provided Elsewhere		
1	Card Reader	Specified/Provided Elsewhere		
1 St	Perimeter Gasketing	706E X HEAD AND JAMBS	AL	NGP
1	Sweep	C627A X DOOR WIDTH	AL	NGP
1	Threshold	896ADJ X OPENING WIDTH	AL	NGP
1	Controller	Specified/Provided Elsewhere		
1	Power Supply	Specified/Provided Elsewhere		

Remainder of hardware existing to remain.

Verify manfuacturer of existing exit device manufacturer prior to ordering latch retraction retro-fit kit.

Set #03 –EXTERIOR DOOR 100.2

1 Door Contact Surface Specified/Provided Elsewhere Remainder of hardware existing to remain.

Set #04 –EXTERIOR DOOR 101.1

2 Door Contact Surface Specified/Provided Elsewhere Remainder of hardware existing to remain.

Set #05 –INTERIOR DOOR WIRELESS LOCK DOOR 110.1, 111, 113.2, 114, 115, 117.1, 201.1, 203

1	Wireless Lock	NDEBBD X 13-247-47267101 X RHO	626	SCH
1	Core	SFIC Match Owner's Existing System	626	BES
1	Closer	QDC111 BF R (mount inside room)	689	DOR
Demoinder of herdware evicting to remain				

Remainder of hardware existing to remain.

Set #06 –INTERIOR DOOR CARD READER HARDWIRED DOOR 112.1, 116.1

1	Latch Retraction Kit	LR100 Series	SDC
1	Armored Transfer Loop	EPT-2	PRE
1	Card Reader	Specified/Provided Elsewhere	
1	Controller	Specified/Provided Elsewhere	
1	Power Supply	Specified/Provided Elsewhere	
Remainder of hardware existing to remain.			

Verify manfuacturer of existing exit device manufacturer prior to ordering latch retraction retro-fit kit.

Set #07 – NEW OFFICE DOOR DOOR 201.2

3	Hinges	CB179 TYPE AS REQUIRED	626	BES
1	Office Lock	ND53 X RHO	626	SCH
1	Core	SFIC Match Owner's Existing System	626	BES
1	Closer	QDC111 BF R (mount inside room)	689	DOR
1	Kick Plate	K050 8" x 2" LDW CSK 4BE	630	TRI
1	Door Stop	1211/1270CV AS REQUIRED	626	TRI

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# 3 Door Silencers 1229A

GREY TRI

## Set #08 – Engage Accessories

All gateways, software, credentials, and other necessary accessories to complete Engage Access Control System specified/provided elsewhere.

# Set #08 –INTERIOR DOOR CARD READER WIRELESS – ALTERNATE 3 DOOR 112.1, 116.1

1	Exit Device w/Trim	9927L X Wireless Trim X LBR	626	VON	
1	Exit Device	9927EO LBR	626	VON	
1	Wireless Trim	AD400-993S-70-MT X B X X4B RHO	626	SCH	
1	Armored Transfer Loop	EPT-2		PRE	
1	Card Reader	Specified/Provided Elsewhere			
1	Controller	Specified/Provided Elsewhere			
1	Power Supply	Specified/Provided Elsewhere			
Provide fillers as needed for door/frame.					
_					

Remainder of hardware existing to remain.

END OF SECTION

SECTION 08 80 00 - GLASS AND GLAZING

PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. Section Includes:
  - 1. Glazing exterior entrances.
  - 2. Interior glazing.

#### 1.3 RELATED SECTIONS:

- A. Related work under other sections:
  - 1. Division 07 Section "Joint Sealants."
  - 2. Division 08 Section "Hollow Metal Doors and Frames."

## 1.4 QUALITY ASSURANCE:

- A. Manufacturer of Basic Glass: (one of the following)
  - 1. C-E Glass Division
  - 2. Libbey-Owens-Ford Company (Spectrum)
  - 3. PPG Architectural Glass
  - 4. Virginia Glass Co.
  - 5. Cardinal Glass Co.

#### 1.5 DEFINITIONS

- A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in reference glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

# 1.6 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thickness by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
  - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
    - a. Specified Design Wind Loads: As required by Code.
    - b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
      - 1) Load Duration: 60 seconds or less.
    - c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.
      - 1) Load Duration: 30 days.
    - d. Maximum Lateral Deflection: For the following types of glass supported on all 4 edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side strength or 1 inch, whichever is less.
      - 1) For monolithic glass lites heat-treated to resist wind loads.
      - 2) For insulating glass.
      - 3) For laminated glass lites.
    - e. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.
- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
  - 1. For insulating-glass units, properties are based on units with lites 6.0 mm thick and have a nominal 1/2-inch-wide interspace.
  - 2. Center-of-Glass Values: Based on using LBL-44789 WINDOW 5.0 computer program for the following methodologies:
    - a. U-Factors: NFRC 100 expressed as Btu/sq. ft. x h x deg F.
    - b. Solar Heat Gain Coefficient: NFRC 200.
    - c. Solar Optical Properties: NFRC 300.

## 1.7 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: Submit 12" x 12" x 1" manufacturers/fabricators samples of each glass Type and any alternate samples that may be requested by the Architect. Samples to match exactly the glass specifications, manufacturing techniques, thickness, color, and/or coatings.

- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
  - 1. For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.
- E. Qualification Data: For installers.
- F. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- G. Product Test Reports: For each of the following types of glazing products.
  - 1. Insulating glass.
  - 2. Glazing sealants.
  - 3. Glazing gaskets.
- H. Warranties: Special warranties specified in this Section.

## 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance.
- B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, laminated glass and insulating glass.
- C. Source Limitations for Glass Sputter-Coated with Solar Control Low-E Coatings: Where solarcontrol low-e coatings of a primary glass manufacturer that has established a certified fabricator program is specified, obtain sputter-coated solar-control low-e coated glass in fabricated units from a manufacturer that is certified by coated-glass manufacturer.
- D. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.
- E. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
  - Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  - 2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
- F. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:

- 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
- 2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
- 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
- 4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
- 5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing, materials matching those submitted.
- G. Safety Glazing Products: Comply with testing requirements in 16 CFR 120.
  - 1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
  - 2. Where glazing units are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, providing glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.
- H. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- I. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:
  - 1. Insulating Glass Certification Council.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturers written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

## 1.10 JOB CONDITIONS:

A. Examine the framing and glazing channel surfaces, backing, removable stop design, and the conditions under which the glazing is to be performed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the glazing until unsatisfactory conditions have been corrected.

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

## 1.11 WARRANTY

- A. Manufacturer's Special Warranty for Insulated Glass and for Coated-Glass Products: Manufacturer's standard form, made out to the Owner and signed by coated glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
  - 1. Warranty Period: Ten years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 MATERIALS:

- A. Glass:
  - 1. Tempered Safety Glass: Either plate glass or float glass (FS DD-G-1403); which has been heat-strengthened by manufacturer's standard process (after cutting to final size), to achieve a flexural strength of four times normal glass strength; 1/4" thick, except as otherwise indicated.
    - a. Clear: Kind FT, Condition A, Type I, Class 1, Quality q3.
- B. Insulating Glass: Manufacturer's standard units of two sheets of 1/4" thick plate or tempered glass as required (inner sheet-clear as specified above; exterior sheet clear, as specified above); permanently and hermetically sealed together at edges with spacers, sealant and desiccant, etc.; to provide a dehydrated air space 1/2" thick with -60 degrees F. dew point; fabricated to the sizes and shapes indicated. Permanently label all sealed insulating units through the IGCC. Provide units with Class "C" label.
  - 1. Guarantee: Provide manufacturer's ten (10) year guarantee.
- C. Laminated Glass: Thickness as indicated, consisting of clear, tempered exterior glass, a clear PVB interlayer of .030" thickness and clear, tempered interior glass. Laminated Glass shall meet the current requirements of the ASTM E-1172 "Standard Specification for Laminated Architectural Float Glass." For safety glazing applications, Laminated Glass shall comply with the Consumer Product Safety Commission 16 CFR 1201 and the Safety Glass requirements of ANSI Z-97.1 (current editions).
- D. Edge Seals: ASTM E 773, with aluminum spacers and silicone sealant for glass spacer seals.
- E. Sealants: Approved by glass manufacturer, grey color as approved by the Architect.

## 2.2 GLAZING SEALANTS/COMPOUNDS:

- A. General: Provide products of type indicated, complying with the following requirements:
  - 1. Compatibility: Verify glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and

glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

- 2. Suitability: Comply with sealant and glass manufacturer's written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
- 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Two-Component Polysulfide Glazing Sealant: Polysulfide two-part elastomeric sealant, complying with FS TT-S-00227 Class A, Type 2 (non-sag); with container bearing Thiokol Chemical Corporation seal of approval; compounded by manufacturer specifically for glazing.
- C. Butyl Rubber Glazing Tape: Partly-vulcanized, self-adhesive, non-staining, elastomeric butyl rubber tape, 98% solids, intended for 35% compression, no appreciable deterioration for 3000-hour test in Atlas Weatherometer.
- D. Acrylic-Latex Glazing Sealant (interior only): Modified latex rubber and acrylic emulsion-polymer, compounded specifically as a glazing sealant with permanent flexibility (non-hardening), non-staining and non-bleeding.
- E. Glazing sealant for fire-resistive glazing products: Identical to products used in test assemblies to obtain fire-protection rating.
- 2.3 MISCELLANEOUS GLAZING MATERIALS:
  - A. Setting Blocks: Neoprene, 70-90 durometer hardness, compatible with sealants used.
  - B. Spacers: Neoprene, 40-50 durometer hardness, compatible with sealants used.
  - C. Compressible Filler Rod (Cp-FR): Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.
  - D. Cleaners, Primers and Sealers: type recommended by sealant or gasket manufacturer.

# PART 3 - EXECUTION

## 3.1 GENERAL:

- A. Standards and Performance:
  - 1. Watertight and airtight installation of each piece of glass is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and air-tight, deterioration of glazing materials and other defects in the work.
  - 2. Protect glass from edge damage at all times during handling, installation and operation of the building.
  - 3. Glazing channel dimensions, as shown, are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thicknesses, with

reasonable tolerances. The Glazier is responsible for correct glass size for each opening, within the tolerances and necessary dimensions established.

- 4. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where the manufacturer's technical representative direct otherwise.
- 5. Comply with "Glazing Manual" by Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.
- 6. Inspect each piece of glass immediately before installation and eliminate any which have observable edge damage or face imperfections.
- 7. Unify the appearance of each series of lights by setting each piece to match the others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.
- 8. Install polysulfide sealants as recommended by Thiokol Chemical Corporation, except as otherwise recommended by the sealant manufacturer.

# 3.2 INSTALLATION:

- A. Preparation of Glazing:
  - 1. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.
  - 2. Apply primer or sealer to joint surfaces where it is recommended by sealant manufacturer.

## B. Glazing:

- 1. Install setting blocks of proper size at quarter points of sill rabbet. Set blocks in thin course of the heel-bead compound, if any.
- 2. Provide spacers inside and out, of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets are used for glazing. Provide I/8" minimum bite of spacers on glass and use thickness equal to sealant width; except with sealant tape, use thickness slightly less than final compressed thickness of tape.
- 3. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.
- 4. Do not attempt to cut, seam, nip or abrade glass which is tempered, heat strengthened, or coated.
- 5. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
- 6. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.
- 7. Clean and trim excess glazing materials from the glass and stops and frames promptly after installation and eliminate stains and discolorations.
- 8. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.
- 9. Gasket Glazing: Miter cut, and bond ends together at corner, where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

# 3.3 CURE, PROTECTION AND CLEANING:

- A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Protect exterior glass from breakage immediately upon installation, by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surfaces of glass.
- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during the construction period, including natural causes, accidents and vandalism.
- D. Maintain glass in a reasonably clean condition during construction, so that it will not be damaged by corrosive action and will not contribute (by wash-offs) to the deterioration of glazing materials and other work.
- E. Provide final glazing clean, when directed, prior to building/Project completion and final payment.

END OF SECTION 08 80 00

### SECTION 09 22 20 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 DESCRIPTION OF WORK:

- A. The types of metal stud systems required include:
  - 1. Steel studs for non-load-bearing curtain walls.
  - 2. Screw-type steel studs for drywall work.

# 1.3 RELATED WORK UNDER OTHER SECTIONS:

- A. Division 05 Section "Metal Fabrications."
- B. Division 07 Section "Sound Attenuation Batts"
- C. Division 09 Section "Gypsum Board."

### 1.4 SUBMITTALS:

A. Product Data: For information only, submit copies of manufacturer's specifications and installation instructions for each type of metal stud and accessories including other data as may be required to show compliance with these specifications.

### 1.5 QUALITY ASSURANCE:

- A. U.L. Rated Assemblies: Where metal studs are components of assemblies indicated for a fire-resistance rating, including those required for compliance with governing regulations, provide studs identical with units, tested and shown in the applicable UL design of the "Fire Resistance Index" and Gypsum Association "GA-600" latest edition.
- B. Manufacturer: Provide steel studs, of the type(s) indicated, produced by one of the following:
  - 1. Punched-type non-load-bearing curtain wall studs:
    - a. Marino Corporation
    - b. Dietrich Industries
    - c. Certified members of the Steel Stud Manufacturers Association
  - 2. Screw-type light gauge drywall studs:
    - a. Marino Corporation
    - b. Dietrich Industries
    - c. Certified members of the Steel Stud Manufacturers Association

### 1.6 PRODUCT DELIVERY AND STORAGE:

A. Protect metal studs from rusting and damage. Deliver to the project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off the ground in a dry ventilated space.

# PART 2 - PRODUCTS

## 2.1 GENERAL:

- A. Installation standard ASTM C 754.
- B. System Components: With each type of metal stud required, provide manufacturer's standard runners (tracks), shoes, clips, ties, stiffeners, fasteners, door jamb reinforcers and accessories as recommended by the manufacturer for the applications indicated, to provide a complete metal stud system.
- C. Punched Steel Non-Load-Bearing Studs: Manufacturer's standard formed steel studs of the height, depth, shape and gage indicated; and with the section modulus indicated, if any; with punched webs to facilitate erection of system and passage of mechanical/electrical service lines.
  - 1. Gage: As scheduled.
  - 2. Depth of Section: As shown.
  - 3. Steel: ASTM A 570, Grade D (40,000 psi yield strength).
  - 4. Finish: Hot-dip zinc coating complying with ASTM A 525, G90.
  - 5. Face of Flanges: Screw type (knurled to facilitate use of self-drilling tapping fasteners).
- D. Drywall Screw-Type Steel Studs: Manufacturer's standard formed light gauge steel studs complying with ASTM C 645, of the height, size, and gage indicated; with punched webs to facilitate erection of system and passage of mechanical/electrical service lines.
  - 1. Gage: 25 gage minimum, however, provide 20 gage studs in unbraced partitions over 10 feet in height, and at certain door jambs hereinafter specified.
  - 2. Depth of Section: As indicated.
  - 3. Flange Width: Not less than 1.25".
  - 4. Shape: "Cee" shape (returned flanges).
  - 5. Steel and Finish: ASTM A 591 Commercial Quality electrolytic zinc coated steel, Class B.
  - 6. Face of Flanges: Screw-type (knurled to facilitate use of self-drilling tapping fasteners).

- E. Recycled content:
  - 1. Target recycled content for Electric Arc Furnace Steel Products 64% post-consumer / 30% post industrial
  - Target recycled content for Basic Oxygen Furnace Steel Products 21% post-consumer / 8% post industrial

# PART 3 - EXECUTION

## 3.1 INSTALLATION:

### A. General:

- 1. Manufacturer's Instructions: Install metal stud systems in accordance with manufacturer's printed or written instructions and recommendations.
- 2. ANSI Standards: Comply with applicable requirements of ANSI A 42.3 and A 42.4, except where more detailed or more stringent requirements are indicated.
- 3. Gypsum Association Specifications: Comply with the requirements and recommendations of GA-203 latest edition "Installation of Screw-Type Steel Framing Members to Receive Gypsum board", where metal studs are indicated to receive gypsum board.
  - a. Coordinate requirements and recommendations with GA-600 latest edition for wall construction type and/or sound ratings.
- 4. Runner Tracks: Install continuous tracks sized to match studs. Align tracks accurately to the layout at base and tops of studs. Secure tracks for the type of construction involved, except do not exceed 24" O.C. spacing for nail or power-driven fasteners, nor 16" O.C. for other types of attachment. Provide fasteners at corners and ends of tracks.
  - a. Isolation of Stud Systems from Structures: Where stud systems abut ceiling or deck construction or vertical structural elements, provide slip or cushion-type joint between stud system and structure to prevent the transfer of structural loads or movements to stud systems, unless otherwise shown.
- 5. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- 6. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.
- 7. Height of Partition Stud Systems: Terminate top of all partitions at underside of construction above, unless shown otherwise.
- 8. Stud Spacing: Space studs at 16" O.C. maximum, install studs so flanges within framing system, point in same direction.
- B. Installation of Stud System to Receive Gypsum Board:
  - 1. Runner Tracks: At partition corners and intersections, butt runner tracks, except leave clearance where base course of gypsum board is to run through.
  - 2. Friction fit studs to runner tracks by positioning and rotating into place. Provide positive attachment to tracks for studs located at partition corners and intersections, and adjacent to openings, and for jack studs located above and below openings. Attach with either self-tapping screws or by use of clinching tool, at both flanges of stud.
  - 3. At partition corners and intersections, provide a minimum of 3 studs, positioned to support each surface of partition; or provide 2 studs with the second stud installed after the base course of gypsum board has been run through, and screw anchor the second stud through the gypsum board to the first stud at 2' O.C. spacing.
  - 4. Install full length studs between runner tracks wherever possible. If necessary, splice studs by nesting with a minimum lap of 8" and fasten laps with 2 screws through each flange.
  - 5. Frame door openings with vertical studs securely attached to each jamb of door frame. On head of door frame install runner track; cut flanges at ends, bend web 90 degrees and screw attach to jamb studs. Install jack studs over door opening, spaced same as full-height studs. Where control joints are shown to extend upward from door jambs, install an

unattached cripple stud spaced 1/2" from jamb or strut stud(s). Space next full-height stud not more than 6" from jamb or strut stud(s).

- a. Provide jamb stud(s) at swing/hinged-door openings as follows:
  - 1) Door widths up to 4'-0" 2-25 gage or 1-20 gage
  - 2) Door opening in excess of 4' 2-20 gage
- b. Attach jamb studs to metal door frames with metal clips, each with two screws into jamb stud.
- 6. Frame openings other than door openings in the same manner as required for door openings and install framing below sills of openings to match framing required above door heads.
- 7. Frame both sides of expansion and control joints as shown for the partition system, with a separate stud and do not bridge the joint with components of the stud system.

END OF SECTION 09 22 20

### SECTION 092650 - GYPSUM VENEER PLASTERING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Gypsum veneer plaster and gypsum base for veneer plaster.
- B. Related Requirements:
  - 1. Division 09 Section "Non-Structural Metal Framing" for non-load-bearing steel framing.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
  - 1. Show locations, fabrication, and installation of control joints, reveals, and trim; include plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 10-inch (250-mm) length for each trim accessory.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Stack panels flat on leveled supports off floor or slab to prevent sagging.

#### 1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 843 requirements or gypsum veneer plaster manufacturer's written recommendations, whichever are more stringent.

- B. Room Temperatures: Maintain not less than 55 deg F (13 deg C) or more than 80 deg F (27 deg C) for seven days before application of [gypsum base and gypsum veneer plaster, continuously during application, and after application until veneer plaster is dry.
- C. Avoid conditions that result in gypsum veneer plaster drying too rapidly.
  - 1. Distribute heat evenly; prevent concentrated or uneven heat on veneer plaster.
  - 2. Maintain relative humidity levels, for prevailing ambient temperature, that produce normal drying conditions.
  - 3. Ventilate building spaces in a manner that prevents drafts of air from contacting surfaces during veneer plaster application until it is dry.
- D. Do not install panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Source Limitations: Obtain gypsum veneer plaster products, including gypsum base for veneer plaster, joint reinforcing tape, and embedding material, from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. High-Strength, One-Component Gypsum Veneer Plaster: ASTM C 587, ready-mixed, smooth, finish-coat veneer plaster containing mill-mixed, fine silica sand; with a compressive strength of 3000 psi (20 MPa) when tested according to ASTM C 472; and formulated for application directly over substrate without use of separate base-coat material.
  - 1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Basis of Design: National Gypsum Company:
      - 1) Base Coat: Kal-Kote Plaster Base.
      - 2) Smooth Finish Coat: Kal-Kote Smooth Finish, Uni-Kal Plaster, X-KALibur Plaster.
      - 3) Smooth Finish Coat: Diamond Interior Finish Plaster.

### 2.3 PANEL PRODUCTS

- A. Gypsum Base for Veneer Plaster, Type X: ASTM C 1396/C 1396M.
  - 1. Products: Subject to compliance with requirements, provide the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. CertainTeed Corp.; ProRoc Veneer Plaster Base, Type X.
    - b. Georgia-Pacific Gypsum LLC, Subsidiary of Georgia Pacific; Tough Rock Fireguard Veneer Plaster Base.
    - c. National Gypsum Company; Kal-Core Fire-Shield, Type X.
    - d. USG Corporation; Imperial Firecode Gypsum Base.
  - 2. Thickness: 5/8 inch (15.9 mm)

# 2.4 TRIM ACCESSORIES

- A. Standard Trim: ASTM C 1047 provided or approved by manufacturer for use in gypsum veneer plaster applications indicated.
  - 1. Material: Galvanized-steel sheet or aluminum-coated steel sheet; rolled zinc, plastic, or paper-faced galvanized-steel sheet, Galvanized-steel sheet or aluminum-coated steel sheet or rolled zinc, Plastic, Paper-faced, galvanized-steel sheet.
  - 2. Shapes:
    - a. Cornerbead.

# 2.5 JOINT REINFORCING MATERIALS

- A. General: Comply with joint strength requirements in ASTM C 587 and with gypsum veneer plaster manufacturer's written recommendations for each application indicated.
- B. Joint Tape:
  - 1. Gypsum Base for Veneer Plaster: As recommended by gypsum veneer plaster manufacturer for applications indicated.
- C. Embedding Material for Joint Tape:
  - 1. Gypsum Base for Veneer Plaster: As recommended by gypsum veneer plaster manufacturer for use with joint-tape material and gypsum veneer plaster applications indicated.

# 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced product standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing), produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- D. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, nonstaining latex sealant complying with ASTM C 843. The product effectively reduces airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

# PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.

#### 3.2 PREPARATION

#### 3.3 INSTALLING PANELS, GENERAL

- A. Gypsum Base for Veneer Plaster: Apply according to ASTM C 844 unless manufacturer's written recommendations are more stringent.
  - 1. Do not allow gypsum base to degrade from exposure to sunlight, as evidenced by fading of paper facing.
  - 2. Erection Tolerance: No more than 1/16-inch (1.6-mm) offsets between planes of gypsum base panels, and 1/8 inch in 8 feet (3 mm in 2.4 m) noncumulative, for level, plumb, warp, and bow.
- B. Install sound attenuation blankets before installing gypsum base for veneer plaster.
- C. Install panels with face side out. Butt the panels together for a light contact at edges and ends with not more than 1/16 inch (1.6 mm) of open space between panels. Do not force it into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not locate joints, other than control joints, at corners of framed openings.
- E. Attach panels to steel studs so the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- F. Attach panels to framing provided at openings and cutouts.
- G. Form control joints with space between edges of adjoining panels.

- H. Cover both sides of partition framing with panels in concealed spaces, including above ceilings, except in internally braced chases.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.74 sq. m) in area.
  - 2. Fit panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints; seal joints with acoustical sealant.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Fastener Spacing: Comply with ASTM C 844, manufacturer's written recommendations, and fire-resistance-rating requirements.
  - 1. Space screws a maximum of 12 inches (305 mm) O.C. along framing members for wall or ceiling application.

## 3.4 INSTALLING PANELS

- A. Install panels for veneer plaster in locations indicated on Drawings.
- B. Single-Layer Application:
  - 1. On walls, apply gypsum base panels vertically and parallel, horizontally and perpendicular to framing unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
- C. Fasteners: Drive fasteners flush with gypsum base surface. Do not overdrive fasteners or cause surface depressions.
- D. Single-Layer Fastening Methods: Apply gypsum base panels to support steel drill screws.

# 3.5 INSTALLING TRIM ACCESSORIES

- A. General: Install trim with back flanges intended for fasteners and attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.

#### 3.6 INSTALLING JOINT REINFORCEMENT

A. Gypsum Base: Reinforce interior angles and flat joints with joint tape and embedding material to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.

### 3.7 GYPSUM VENEER PLASTERING

- A. Bonding Agent: Apply bonding agent on dry exposed masonry (where patching ceiling) according to gypsum veneer plaster manufacturer's written recommendations.
- B. Gypsum Veneer Plaster Mixing: Mechanically mix gypsum veneer plaster materials to comply with ASTM C 843 and with gypsum veneer plaster manufacturer's written recommendations.
- C. Gypsum Veneer Plaster Application: Comply with ASTM C 843 and with veneer plaster manufacturer's written recommendations.

### 3.8 PROTECTION

- A. Protect installed gypsum veneer plaster from damage from weather, condensation, construction, and other causes during remainder of the construction period.
- B. Remove and replace gypsum veneer plaster and gypsum base panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that gypsum base panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that gypsum base panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092650

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. American Society for Testing and Materials (ASTM):
  1. ASTM C 840 Standard Specification for Application and Finishing of Gypsum Board
- C. Gypsum Association (GA)1. GA-216 Application and Finishing of Gypsum Board

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum board.
- B. Related Requirements:
  - 1. Division 07 Section "Sound Attenuation Batts"

# 1.3 ACTION SUBMITTALS

- A. Product Data: For information only, submit copies of manufacturer's product specifications and installation instructions for each gypsum drywall component, including other data as may be required to show compliance with these specifications.
- B. Submittals: Shall indicate compliance with the International Green Construction Code 2012:
  - 1. Products: Products and materials are required to comply with the requirements stated in the IGCC 2012 Chapter 5 Material Resource Conservation. Include a statement indicating that the product is in compliance and submit the appropriate documentation.
- C. Certification: Submit certification that proposed materials conform to the Fire Test Data of ASTM E 84.
- D. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

## 1.4 QUALITY ASSURANCE

- A. Fire-Resistance Rating: Where work is indicated for fire-resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies tested and listed by recognized authorities, including U.L. and A.I.A.
- B. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer.
- C. Allowable Tolerances: 1/8" offsets between planes of board faces, and 1/4" in 8'-0" for plumb, level, warp and bow.

### 1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver gypsum drywall materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers off the ground on a flat platform to prevent sagging.

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 and GA-216 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Examine the substrates and the spaces to receive gypsum drywall, and the conditions under which gypsum drywall is to be installed; and do not proceed with the installation until unsatisfactory conditions have been corrected.
- C. Maintain ambient temperatures at not less than 55 degrees F., for the period of 24 hours before drywall finishing, during installation and until compounds are dry.
- D. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- E. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

# PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

#### 2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

#### 2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. American Gypsum.
  - 2. CertainTeed Corp.
  - 3. Georgia-Pacific Gypsum LLC.
  - 4. National Gypsum Company.
  - 5. USG Corporation.
- B. General: Comply with GA-216 ASTM C 1396/C 1396M.
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch (15.9 mm).
  - 2. Long Edges: Tapered.

#### 2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Material: Galvanized steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
  - 2. Shapes:
    - a. Corner bead.
    - b. Bullnose bead.
    - c. Casing bead / LC-Bead: J-shaped; exposed long flange receives joint compound.

- d. L-Bead: L-shaped; exposed long flange receives joint compound.
- e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
- f. Expansion (control) joint.
- g. Curved-Edge corner bead: With notched or flexible flanges.

# 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  - 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Prefilling: At open joints, rounded edges, and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
  - 4. Finish Coat: For the third coat, use drying-type, all-purpose compound.
  - 5. Skim Coat: For the final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

### 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Expansion Joints: Rigid vinyl, 1-1/2" wide, 10' lengths, with removable flexible vinyl strip.
- C. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  - 1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- E. Sound Attenuation Blankets: As specified in Division 07 Section "Sound Attenuation Batts."

- F. Acoustical Joint Sealant: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834. The product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Accumetric LLC; BOSS 824 Acoustical Sound Sealant.
    - b. Grabber Construction Products; Acoustical Sealant GSC.
    - c. Pecora Corporation; AC-20 FTR.
    - d. Specified Technologies, Inc. Smoke N Sound Acoustical Sealant.
    - e. USG Corporation; SHEETROCK Acoustical Sealant.
  - 2. Acoustical joint sealant shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 APPLYING AND FINISHING PANELS, GENERAL
  - A. Comply with ASTM C 840.
  - B. Install panels with face side out. Butt the panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
  - C. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
  - D. Form control and expansion joints with space between edges of adjoining gypsum panels. Control joints to be installed minimum 24'-0" o.c. until noted otherwise.
  - E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
    - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

- 2. Fit gypsum panels around ducts, pipes, and conduits.
- 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8- inches- (6.4- to 9.5-mm-) wide joints to install sealant.
- F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2- inches- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- G. Attachment to Steel Framing: Attach panels so the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- H. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- I. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

## 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  - 1. Wallboard Type: As indicated on Drawings.
  - 2. Type X: As indicated on Drawings.
- B. Single-Layer Application:
  - 1. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  - 2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
  - 1. Corner bead: Use at outside corners.
  - 2. Bullnose Bead: Use where indicated.
  - 3. LC-Bead: Use at exposed panel edges.
  - 4. L-Bead: Use where indicated.
  - 5. U-Bead: Use at exposed panel edges.

# 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Drywall finishing to be installed in accordance with Gypsum Association "Recommended Levels of Gypsum Board Finish, #GA-214-M-97" and ASTM C 840.
  - 1. Level #0
    - a. For use in areas of temporary construction
    - b. No taping, finishing or accessories.
  - 2. Level #1
    - a. In areas above ceilings and areas not exposed to public view. Tape and fastener heads need not be covered with joint compound.
    - b. Tape, set in joint compound at joints and interior angles.
    - c. Finish surface to be free of excess compound. Some tool marks and ridges are acceptable.
  - 3. Level #4
    - a. Use in areas to receive flat paint, light texture finish, or light-duty wall covering.
    - b. At joints: Taped as "Level #2" then covered with two separate coats of joint compound.
    - c. At interior angles: Taped as "Level #2" then covered with one separate coat of joint compound.
    - d. At accessories and fasteners: Cover with three separate coats of joint compound.
    - e. Surface to be smooth and free of all ridges and tool marks.
  - 4. Level #5: Typical at interior walls unless noted otherwise.
    - a. Primer and its application to surfaces are specified in other Division 09 Sections.

### 3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove them from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during the remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet, or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 29 00

SECTION 09 30 00 - TILING

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Porcelain tile.
- B. Related Sections:
  - 1. Division 07 Section "Joint Sealants."

#### 1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

### 1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
  - 1. Level Surfaces: Minimum 0.60 minimum.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
  - 1. Full-size units of each type and composition of tile and for each color and finish required.

### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and -grouting product.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

### 1.8 QUALITY ASSURANCE

1.

- A. Source Limitations for Tile:
  - Obtain tile of each type and color or finish from one source or producer.
    - a. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
  - 1. Waterproof membrane.
- D. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

### 1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

### PART 2 - PRODUCTS

### 2.1 PRODUCTS, GENERAL

- A. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- B. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tiles units taken from one package show same range in colors as those taken from other packages and match approved Samples.

### 2.2 TILE PRODUCTS

A. Basis-of-Design Product: Match existing floor tile finish and size.

Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- Daltile
- Florida Tile
- American Olean

### 2.3 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, selected from the following that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Latex-Portland Cement: Flexible mortar consisting of cement-based mix and latex additive.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Laticrete
    - b. Boiardi Products; a QEP company; Elastiment 323 Cement Based Waterproofing, Anti-Fracture/Crack Suppression Membrane.
    - c. C-Cure; UltraCure 971.
    - d. MAPEI Corporation; Mapelastic (PRP 315).
    - e. Southern Grouts & Mortars, Inc.; Southcrete 1100.
    - f. TEC; a subsidiary of H. B. Fuller Company; Triple Flex Waterproofing, Crack Isolation Membrane & Mortar.

# 2.4 SETTING MATERIALS

- A. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3., with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24)., that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Bostik, Inc.
    - b. Laticrete International, Inc.
    - c. MAPEI Corporation.
    - d. Mer-Kote Products, Inc.
    - e. TEC; a subsidiary of H. B. Fuller Company.

#### 2.5 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Bostik, Inc.
    - b. Custom Building Products.
    - c. Laticrete International, Inc.
    - d. MAPEI Corporation.
    - e. Mer-Kote Products, Inc.

#### 2.6 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
  - 1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Sealants shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  - 3. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

#### 2.7 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cementbased formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

### 2.8 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
  - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  - Verify that concrete substrates for tile floors installed with adhesives, bonded mortar bed or thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
    - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
  - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
  - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

### 3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
    - a. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
    - b. Tile floors composed of rib-backed tiles.
- B. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- C. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to groutsealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

### 3.4 WATERPROOFING INSTALLATION (when required)

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

### 3.5 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Remove epoxy grout residue from tile as soon as possible.
  - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned.
  - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

### 3.6 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
- B. Contractor shall follow the appropriate installation methods & techniques per TCA for both the required tile and underlayments for subsurface conditions to be covered.
  - 1. Tile Installation F125A: Thin-set mortar on crack isolation membrane; TCA F125A.
    - a. Tile Type: Porcelain Tile
    - b. Thin-Set Mortar: Latex Portland cement mortar.
    - c. Grout: Water-cleanable epoxy grout.

END OF SECTION 09 30 00

### SECTION 09 51 10 - ACOUSTICAL TILE CEILINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Acoustical tiles for ceilings.
  - 2. Concealed suspension systems.
- B. Related Requirements: 1. Division 26-27
- C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

#### 1.3 PRE-INSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6-inches- (150mm-) in size.
- C. Samples for Initial Selection: For components with factory-applied color finishes.
- D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
  - 1. Acoustical Tile: Set of full-size Samples of each type, color, pattern, and texture.
  - 2. Concealed Suspension-System Members: 6-inch- (150-mm-) long Sample of each type.
  - 3. Exposed Moldings and Trim: Set of 6-inch- (150-mm-) long Samples of each type and color.

### 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

- 1. Ceiling suspension-system members.
- 2. Method of attaching hangers to building structure.
  - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
- 3. Size and location of initial access modules for acoustical tile.
- 4. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- 5. Minimum Drawing Scale: 1/8 inch = 1 foot (1:96).
- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical tile ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.
- E. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed.
  - 2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.

## 1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to the National Voluntary Laboratory Accreditation Program (NVLAP) for testing indicated.

### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and stabilized moisture content.
- C. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

#### 1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for the Project when occupied for its intended use.

## PART 2 - PRODUCTS

#### 2.1 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

#### 2.2 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

#### 2.3 ACOUSTICAL TILES, GENERAL

- A. Low-Emitting Materials: Acoustical tile ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Source Limitations:
  - 1. Acoustical Ceiling Tile: Obtain each type from single source from single manufacturer.
  - 2. Suspension System: Obtain each type from single source from single manufacturer.
- C. Source Limitations: Obtain each type of acoustical ceiling tile and supporting suspension system from single source from single manufacturer.
- D. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
  - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.

- E. Acoustical Tile Colors and Patterns: Match appearance characteristics indicated for each product type.
  - 1. Where appearance characteristics of acoustical tiles are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

### 2.4 ACOUSTICAL TILES

- A. Basis-of-Design Product: Match existing acoustical ceiling tile size, type and finish. Subject to compliance with requirements, otherwise provide product indicated on Drawings or comparable product by one of the following. If not indicated, provide 24" x 24" x <sup>3</sup>/<sub>4</sub>"" thick and 24" x 48" x 34" thick, angled or tegular. to match existing ceiling tiles and grid.
  - 1. Basis of Design by Armstrong World Industries, Inc. Mesa High CAC.

Other acceptable manufacturers:

- 2. CertainTeed Corp.
- 3. USG Interiors, Inc.;
- 4. For other manufacturers see substitutions sections for product requirements.
- B. Color: match existing ceiling tiles.
- C. Supply new ceiling tiles at Social Room where existing tiles are wet, damaged and/or broken. Match existing size and type (+/- 20 ceiling tiles, confirm final count in field). Modifications may be required at existing ceiling grid and tiles where new projector and drop down screen are to be installed in Social Room.
- D. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

# 2.5 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension-System Standard: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M as applicable to the type of suspension system required for the type of ceiling units indicated. Coordinate with other work supported by or penetrating through the ceilings, including light fixtures, HVAC equipment, and partition system (if any).
- B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
  - 1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without

failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 12 gauge diameter wire.
- D. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.
- E. Angle Hangers: Angles with legs not less than 7/8-inch (22 mm) wide; formed with 0.04-inch-(1-mm-) thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

# 2.6 METAL SUSPENSION SYSTEM

- A. Product: Match existing metal suspension system. Subject to compliance with requirements, otherwise provide same as acoustical ceiling manufacturer or comparable product by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CertainTeed Corp.
  - 3. USG Interiors, Inc.;
- B. Type of System: Either Direct-Hung, Double-Web Suspension System or Indirect Hung Suspension System (as Contractor's option): Main and cross runners roll formed from and capped with cold-rolled steel sheet, pre-painted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 (Z90) coating designation.
  - 1. Indirect-Hung Suspension System, conform to the following:
    - a. Carrying Channels: 1-1/2" steel channels, hot-rolled or cold-rolled, not less than 0.475 lbs. per lin. Ft.
- C. Exposed Suspension System: Manufacturer's standard exposed runners, cross-runners and accessories, of the types and profiles indicated, with exposed cross-runners coped to lay flush with main runners.
  - 1. Finish of Exposed Members: Provide uniform factory-applied finish on exposed surfaces of ceiling suspension system including moldings, trim and accessories.
  - 2. Finish: Manufacturer's standard baked enamel finish, white unless otherwise selected by Architect.
  - 3. Profile: Tee, square edge panels 15/16" wide face (match existing)
  - 4. Color: Match existing
  - 5. Basis of Design: Prelude XL, 15/16" by Armstrong. Match existing, confirm in field.

## 2.7 METAL EDGE MOLDINGS AND TRIM

A. Edge Moldings: Provide manufacturer standard angle moldings; in finish to match exposed system. Provide manufacturer's standard angle moldings in finish to match exposed system.

### 2.8 ACOUSTICAL SEALANT

A. Acoustical Sealant: A heavy-bodied, non-shrinking, non-drying, non-sag, grade mastic compound intended for interior sealing of concealed construction joints.

#### PART 3 - EXECUTION

### 3.1 EXAMINATION AND PREPARATION WORK

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Verify that layout of hangers will not interfere with other work; make adjustments in layout as necessary.
- E. Do not begin ceiling installation until services above ceiling are complete except for final trim.
- F. Notify Architect of unsatisfactory conditions before proceeding.
- G. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.
- H. Locate system on room axis according to reflected ceiling plan.

### 3.2 INSTALLATION OF CEILING TILES

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
  - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Install acoustical panels in accordance with manufacturer's written instructions.
- C. Lay panels flat into the tee grid. Scribe and cut panels for accurate fit at perimeter and around penetrations.
- D. Hold tile field in compression when performing cuts.
- E. Install acoustical panels after above-ceiling work is complete. Install panels level, in uniform plane, and free from warp, twists, and dents.

F. Installation Tolerance: Maximum variation from flat and level surface is 1:360.

### 3.3 INSTALLATION OF SUSPENSION SYSTEM

- A. General:
  - 1. Conform to the requirements of CISCA (AC) Acoustical Ceilings: Use and Practice.
  - 2. Install in accordance with manufacturer's instructions and ASTM C 636 and ASTM E 580.
  - 3. Attach hangers to structural members. Do not support ceilings directly from permanent metal forms or steel floor or roof deck.
  - 4. Space hangers not more than 48 inches o.c. in both directions.
  - 5. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
  - 6. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
  - 7. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently. Do not eccentrically load system or induce rotation of runners.
  - 8. Perimeter Trim: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required, and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  - 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  - 8. Do not attach hangers to steel deck tabs.
  - 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 10. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
  - 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.
  - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  - 2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
  - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Arrange directionally patterned acoustical tiles as follows:
  - 1. As indicated on reflected ceiling plans.
  - 2. Install tiles with pattern running in one direction parallel to long or short axis of space.
  - 3. Install tiles in a basket-weave pattern.
- G. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.
  - 1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
  - 2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tile and moldings, spaced 12 inches (305 mm) o.c.
  - 3. Protect lighting fixtures and air ducts to comply with requirements indicated for the indicated fire-resistance-rated assembly design.

## 3.4 CLEANING

- A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.
- B. Protect installed acoustical panel ceilings until completion of project.

END OF SECTION 09 51 10

### SECTION 09 65 00 - RESILIENT FLOORING

### PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. All resilient flooring work indicated on the drawings and herein specified.

### 1.3 QUALITY ASSURANCE:

- A. Provide resilient flooring and accessories produced by a single manufacturer.
- B. If requested, finish a sample room for Architect's approval, prior to continuing with the work.
- C. Substrate Testing:
  - 1. Calcium Chloride Test Requirements: Perform anhydrous calcium chloride testing in accordance with ASTM F 1869-98, and forward copies of the test reports to the Architect, Owner, General Contractor, and Flooring Manufacturer's Representative.
  - Surface Tension Test Requirements: Perform pull off test in accordance with ASTM D4541 "Standard Test Method for Pull Off Strength of Coatings Using Portable Adhesion Testers" to test substrate surface tension.
  - 3. In-Situ Relative Humidity Test Requirements: Perform in-situ relative humidity testing in accordance with ASTM F 2170-02, and forward copies of the test reports to the Architect, Owner, General Contractor, and Flooring Manufacturer's Representative.

### 1.4 SUBMITTALS:

- A. Product Data: For information only, submit copies of manufacturer's technical data and installation instructions for each type of resilient flooring and accessory.
  - 1. Submit flame spread test reports in accordance with UL Standard #992, for Index of 0-75.
  - 2. Submit manufacturer's specifications for installation of recycled rubber flooring and underlayment.
- B. Samples:
  - Submit sets of samples of each type, color and finish of resilient flooring and accessory required. Provide full-size tile units and 12" square samples of sheet flooring and 6" long sample of accessory. Include full range of flooring color and pattern variation. Sample submittals will be reviewed for color, texture and pattern only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

- C. Certifications:
  - 1. Submit manufacturer's certifications indicating all resilient flooring materials conform to the following standards:
    - a. Resilient Flooring
      - 1) ASTM E648; NFPA 253, Critical radiant Flux 0.45 watts/cm<sup>2</sup> or greater.
      - 2) ASTM E622; NFPA 258, NBS Smoke Density 450 or less.
  - 2. Submit manufacturer's certification that all products and materials, including mastics, furnished and installed under this Section are "Asbestos-Free".
- D. Maintenance Instructions:
  - 1. Submit copies of the manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring and accessories.
- E. Extra Stock:
  - 1. After completion of work, deliver replacement materials to the project site, as follows:
    - a. Tile flooring, not less than one box for each type, size and color installed.
    - b. Furnish replacement materials from the same manufactured lot as the materials installed.
- F. Pre-installation Meeting: As previously specified.

### 1.5 JOB CONDITIONS:

A. Continuously heat areas to receive flooring to 70 degrees F. for at least 48 hours prior to installation, when project conditions are such that heating is required. Maintain 70 degrees F. temperature continuously during and after installation as recommended by the flooring manufacturer, but for not less than 48 hours.

## PART 2 - PRODUCTS

- 2.1 COLORS AND PATTERNS:
  - A. Provide colors and patterns as selected from manufacturer's standards.
- 2.2 VINYL COMPOSITE TILE FLOORING:
  - A. Manufacturer:

Vinyl Composition or Reinforced Vinyl Tile: FS SS-T-312, Type IV, 12" x 12" x 1/8" gage, "asbestos free".

 <u>Basis of Design:</u> Armstrong Flooring Inc, Migrations BBT with Diamond 10 Technology. Color and type to match existing flooring at Recreation office 201 and Conference Room 203. 2. For other manufacturers provide similar. Flooring to match the existing color and floor type.

## 2.3 LUXURY VINYL TILE FLOORING

- A. Basis-of-Design Product:
  - 1. Type: Luxury Vinyl Tile (LVT)
    - a. Manufacturer: Interface
    - b. Type: High Performance Luxury Vinyl Tile
    - c. Style: Natural Woodgrains A002
    - d. Size: 25 cm x 1m (9.845"x39.38")
    - e. Color: As be selected by Architect
    - f. Installation Layout: As be selected by Architect
    - g. Installation: Direct Glue
    - h. Testing Requirements:
      - IIC Sound Rating ASTM E492-09: 64llc
      - Slip Resistance ASTM D2047: >0.55 wet/dry, ADA Compliant
      - Static Load Limit ASTM F970: 1500 psi
      - Flexibility ASTMF137: Passes
      - Resistance to Heat ASTM F1514: Passes
      - Resistance to Light ASTM F1515: Passes
      - Radiant Flux ASTM E 648: Class I
      - Smoke Density: ASTM E-662: ≤ 450
      - Thickness ASTM F386: Passes
      - Residual Indentation ASTM F1914: Passes
      - Resistance to Chemicals ASTM F925: Passes
  - B. Manufactures: Subject to compliance with requirements, provide comparable product by one of the following:
    - 1. Shaw Contract
    - 2. Mannington
    - 3. Milliken

#### PART 3 - EXECUTION

#### 3.1 INSPECTION:

- A. Examine the areas and conditions under which resilient flooring and accessories are to be installed and do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Verify that that subfloor surfaces are smooth, flat and dust free.

#### 3.2 PREPARATION:

- A. Prior to laying flooring, broom clean or vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work.
  - 1. Use leveling compound as recommended by the flooring manufacturer for filling small cracks and depressions in subfloors.
  - 2. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with the manufacturer's directions.

#### 3.3 INSTALLATION:

- A. General:
  - 1. Install flooring after finishing operations, including painting, have been completed and permanent heating system is operating. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer.
  - 2. Place flooring with adhesive cement in strict compliance with manufacturer's recommendations. Butt tightly to vertical surfaces, thresholds, nosing and edgings. Scribe around obstructions and to produce neat joints, laid tight, even, and straight. Extend flooring into toe spaces, door reveals, and into closets and similar openings.
  - 3. Maintain reference markers, holes or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking devices.
  - 4. Install flooring on covers for telephone and electrical ducts, and other such items occur within finished floor areas.
  - 5. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly cement edges to perimeter of floor around covers and to covers.
  - 6. Tightly cement flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.
- B. Tile Floors:
  - 1. Lay tile from center marks established with principal walls, discounting minor offsets, so that tile at opposite edges of the room is of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.
  - 2. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tiles are not acceptable.
    - a. Lay tile with grain in tile running in the same direction.
- C. Accessories:
  - 1. Apply resilient base to walls, columns, pilasters, casework and other areas where base is required. Except as otherwise indicated, base is required in rooms and areas which have finished floor surfaces. Install base in as long lengths as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces.

- 2. Place resilient edge strips tightly butted to flooring and secure with adhesives. Install edging strips at all unprotected edges of flooring, unless otherwise shown.
- 3. Apply resilient accessories at stair systems as indicated and in strict conformance to manufacturer's installation instructions.

# 3.4 CLEANING AND PROTECTION:

- A. Remove any excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring the manufacturer. Protect installed flooring from damage by covering.
- B. Finishing: After completion of the project and just prior to final inspection of work, thoroughly clean floors and accessories.
  - 1. Apply wax and buff, with type of wax, number of coats and buffing procedures in compliance with flooring manufacturer's instructions.

END OF SECTION 09 65 00

## SECTION 096510 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Resilient.
  - 2. Resilient molding accessories.
- B. Related Sections: Division 09 Section "Ceramic Floor Tile".

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use the same designations indicated on Contract Drawings.

#### 1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Furnish not less than 3% of each type, color, pattern, and size of resilient product installed.

# 1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturers, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

#### 1.7 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturers, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive resilient products during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturers, but not less than 55 deg F (13 deg C) or more than [95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

# 1.8 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Using Portland based cementitious base leveler or patch fill and cover all seams, nail heads, voids, cracks, and expansion joints. Achieve smooth, even, firmly attached substrate for best finish results. Gypsum based underlayment not acceptable with Flooring unless it is first properly prepared.
- C. Encapsulate any gypsum with a premium latex primer/sealer recommended by gypsum manufacturer.
- D. Once substrate flatness is achieved, 1/8 inch in 10 feet (3 mm in 3048 mm), continue with the next step.
- E. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- F. Verify that substrates are dry, free of debris, and that all surfaces have properly cured.
- G. Remove substrate coatings, all existing adhesives, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Mechanical methods shall not telegraph through new flooring finish. Do not use solvents.
- H. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

# PART 2 - PRODUCTS

## 2.1 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
  - 1. Manufacturers:
    - a. Johnsonite / Tarkett
    - b. Roppe Corporation, USA, accessories from flooring manufacturer is not available.
    - c. Schluter Systems
- B. Description:1. Transition strips (where needed).
- C. Material: 4" Rubber
- D. Profile and Dimensions: ADA complaint. To suit flooring. Submit for approval
- E. Colors and Patterns: As selected by Architect from the manufactures full range of colors.

## 2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Floor Polish: Provide protective liquid floor polish products as recommended by resilient stair tread manufacturer.

PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
  - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

#### 3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. A tightly adhered resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along the top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

#### 3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at the edges of carpet and resilient floor covering that would otherwise be exposed.

#### 3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

- B. Perform the following operations immediately after completing resilient product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
  - 1. Apply the number of coat(s) recommended by manufacturer.
- E. Cover resilient products until Substantial Completion.

END OF SECTION 096510

## SECTION 096723 RESINOUS EXPOXY FLOORING

## PART 1 – GENERAL

## 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This section includes the following:
  - 1. Resinous flooring system as shown on the drawings and in schedules.

## 1.3 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of an epoxy based multi roller applied flooring system with Macro colored decorative chips and urethane topcoat. The system shall have the color and texture as specified by the Owner with a nominal thickness of 60 mils. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- B. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted.

#### 1.4 SUBMITTALS

- A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- B. Manufacturer's Safety Data Sheet (SDS) for each product being used.
- C. Samples: A 3 x 3-inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

#### 1.5 QUALITY ASSURANCE

- A. The Manufacturer shall have a minimum of 10 years experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.
- C. No requests for substitutions shall be considered that would change the generic type of the specified System.
- D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
- E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
- F. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

## 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
  - 1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.

- B. Storage and Protection
  - 1. The Applicator shall be provided with a storage area for all components. The area shall be between 60 F and 90 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
  - 2. Copies of Safety Data Sheets (SDS) for all components shall be kept on site for review by the Engineer or other personnel.
- C. Waste Disposal
  - 1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

#### 1.7 PROJECT CONDITIONS

- A. Site Requirements
  - 1. Application may proceed while air, material and substrate temperatures are between 60 F and 90 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
  - 2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
  - 3. The Applicator shall ensure that adequate ventilation is available for the work area.
  - 4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.
- C. Safety Requirements
  - 1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
  - 2. "No Smoking" signs shall be posted at the entrances to the work area.
  - 3. The Owner shall be responsible for the removal of foodstuffs from the work area.
  - 4. Non-related personnel in the work area shall be kept to a minimum.

#### 1.8 WARRANTY

- A. Dur-A-Flex, Inc. warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to Dur-A-Flex, Inc. published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- B. Dur-A-Flex, Inc. liability with respect to this warranty is strictly limited to the value of the material purchase.

#### PART 2 – PRODUCTS

#### 2.1 FLOORING

- A. <u>Basis of Design</u>: Dur-A-Flex, Inc, Dur-A-Chip, Epoxy-Based seamless flooring system with Urethane Top coat.
  - 1. System Materials:
    - a. Primer: Dur-A-Flex, Inc, Dur-A-Glaze #4 WB resin and hardener.
    - b. First Broadcast Coat: Dur-A-Flex, Inc, Dur-A-Gard OPF resin and hardener.
      - i. Chips: Dur-A-Flex, Inc. Macro Decorative Colored Chips.

- c. Second Broadcast and Grout Coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and Water Clear hardener.
  - ii. Chips: Dur-A-Flex, Inc. Macro Decorative Colored Chips.
- d. Grout coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and Water Clear hardener.
- e. Topcoat: Dur-A-Flex, Inc. Armor Top resin, hardener and grit.
- 2. Patch Materials
  - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Dur-A-Glaze #4 Cove Rez.
  - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Dur-A-Crete.

## 2.2 MANUFACTURER

A. Basis of Design:

Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802 (Basis of Design, for other manufacturers provide documentation proving similar).

#### 2.3 PRODUCT REQUIREMENTS

Α.	Primer		Dur-A-Glaze #4 WB	
	1. 2. 3. 4. 5. 6. 7. 6.	Percent Solids VOC Bond Strength to Concrete ASTM D 4541 Hardness, ASTM D 3363 Elongation, ASTM D 2370 Flexibility (1/4: Cylindrical mandrel), ASTM D 1737 Impact Resistance, MIL D-2794 Abrasion Resistance ASTM D 4060, CS 17-wheel, 1,000 g Load	56 % 2 g/L 550 psi, substrates fails 3H 9 % Pass >160 30 mg loss	
B. Broadcast Coat		adcast Coat	Dur-A-Gard OPF	
	1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Percent Solids VOC Compressive Strength, ASTM D 695 Tensile Strength, ASTM D 638 Flexural Strength, ASTM D 790 Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles Flame Spread/NFPA-101, ASTM E 84 Impact Resistance MIL D-3134 Water Absorption. MIL D-3134 Potlife @ 70 F	100 % 59 g/L 16,000 psi 3,800 psi 4,000 psi 35 mg loss Class A 0.025-inch Max Pass 20-25 minutes	
C.	Broadcast Coat and Grout Coat		Dur-A-Glaze #4 Water Clear	
	1. 2. 3. 4. 5. 6. 7. 8. 9.	Percent Solids VOC Compressive Strength, ASTM D 695 Tensile Strength, ASTM D 638 Flexural Strength, ASTM D 790 Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles Flame Spread/NFPA-101, ASTM E 84 Impact Resistance MIL D-24613 delamination Water Absorption. MIL D-24613	100 % 3.8 g/L 11,200 psi 2,100 psi 5,100 psi 29 mg loss Class A 0.0007 inches, no cracking or Nil	
			RESINOUS EXPOXY FLOORING	

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D.

10.	Potlife @ 70 F		20 minutes
Topcoat			Armor Top
1. 2. 3. 4. 5. 6. 7.	Percent Solids VOC Tensile Strength, ASTM D 2370 Adhesion, ASTM 4541 Hardness, ASTM D 3363 60 <sup>o</sup> Gloss ASTM D 523 Abrasion Resistance, ASTM D4060 CS 17 wheel (1,000 g load) 1,000 cycles	4 10	95 % 0 g/L 7,000 psi Substrate Failure 4H 70 Gloss Satin 8 mg loss with grit 12 mg loss without grit
8. 9.	Pot Life, 70 F, 50% RH Full Chemical Resistance		2 Hours 7 days

# PART 3 – EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
- 1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

#### 3.2 PREPARATION

- A. General
- 1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- 2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
  - a. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
  - b. If the relative humidity exceeds 75% then Dur-A-Flex, Inc Dur-A-Glaze MVP Primer moisture mitigation system must be installed prior to resinous flooring installation. Slab-on grade substrates without a vapor barrier may also require the moisture mitigation system.
- 3. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a <u>light</u> passing of a propane torch may be used to dry the substrate.
- 4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

# 3.3 APPLICATION

- A. General
  - 1. The system shall be applied in six distinct steps as listed below:
    - a. Substrate preparation
    - a. Priming
    - b. First broadcast coat application with first chip broadcast
    - c. Second broadcast coat with second chip broadcast
    - d. Grout coat application,
    - e. Topcoat application

- 2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
- 3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
- 4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
- 5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

## B. Primer

- 1. The primer shall be Dur-A-Glaze #4 WB Primer that is mixed at the ratio of 1 part resin to 4 parts hardener per the manufacturer's instructions.
- 2. The primer shall be applied by 1/8-inch notched squeegee and back rolled at the rate of 200 sf/gal to yield a dry film thickness of 4 mils.
- C. Broadcast Coats
  - 1. The broadcast coat shall be applied as a double broadcast system as specified by the Architect.
  - 2. The broadcast coat shall be comprised of two components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener.
  - 3. The resin shall be added to the hardener and thoroughly mixed by suitably approved mechanical means.
  - 4. The first broadcast coat shall be applied over horizontal surfaces using the dip and roll, and back roll method at the rate of 300 sf/gal using the Dur-A-Gard OPF material.
  - 5. Chips shall be broadcast to excess into the wet material, Macro chips at the rate of 0.1 lbs/sf.
  - 6. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
  - 7. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
  - 8. Apply a second broadcast coat of resin shall be applied by flat squeegee then back rolled with a coverage rate of 150 sf/gal with the Dur-A-Glaze #4 Water Clear epoxy.
  - 9. Chips shall be broadcast to excess, Macro chips at the rate of 0.1 lbs./sf.
  - 10. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.
  - 11. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
- D. Grout Coat
  - 1. The grout coat shall be comprised of a Dur-A-Glaze # 4 Water Clear epoxy that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
  - 2. The grout coat shall be squeegee applied and back rolled with a coverage rate of 100 sf/gal.
- D. Topcoat
  - 1. The topcoat of Armor Top shall be roller applied at the rate of 500 sf/gal to yield a dry film thickness of 3 mils.
  - 2. The finish floor will have a nominal thickness of 60 mils.

#### 3.4 FIELD QUALITY CONTROL

- A. Tests, Inspection
  - 1. The following tests shall be conducted by the Applicator:
    - a. Temperature
      - 1. Air, substrate temperatures and, if applicable, dew point.
    - b. Coverage Rates
      - 1. Rates for all layers shall be monitored by checking quantity of material used against the area covered.
- 3.5 CLEANING AND PROTECTION

- A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION

## SECTION 09 70 00 - ARCHITECTURAL FINISHES

PART 1 – GENERAL

## 1.1 RELATED DOCUMENTS

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

#### 1.2 DESCRIPTION OF WORKS

- A. Architectural finish films for the following interior applications: (3M DI-NOC Architectural)
  - 1. New and existing door glazing, vision panels, and as indicated on the drawings.

#### 1.3 RELATED SECTIONS

A. Division 8 - Glass and Glazing.

#### 1.4 REFERENCES

- A. ASTM International (ASTM): ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM International (ASTM): ASTM E 308 Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
- C. ASTM International (ASTM): ASTM E 903 Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- D. Underwriters Laboratories, Inc. (UL): UL 723 Test for Surface Burning Characteristics of Building Materials.

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 Administrative Requirements.
- B. Product Data: Manufacturer's data sheets for products specified, including but not
  - limited to the following:
    - 1.Performance characteristics.
    - 2. Preparation instructions and recommendations.
- C. Storage and handling requirements and recommendations.
  - 1. Maintenance data for installed products, including precautions against harmful cleaning materials and methods.
  - 2. Installation Instructions.

- 3. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including dimensions, anchorage, and accessories.
- 4. Verification Samples: For each film specified, two samples, 4 inches x 4 inches (100 mm x 100 mm), representing actual architectural film colors and patterns.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Regularly engaged in the manufacture of architectural finish films.
- B. Installer Qualifications: Installation shall be performed by a trained and qualified installer, specialized and experienced in the work required for this project. A list of 3M Endorsed installers is available at 3M.com/AMD or 3M Commercial Solutions, 1-888-650-3497.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
- D. Finish areas designated by Architect.
- E. Do not proceed with the remaining work until workmanship is approved by the Architect.
- F. Refinish mock-up area as required to produce acceptable work.
- G. Mock-up area may not become part of finished work.
- 1.7 DELIVERY, STORAGE AND HANDLING
  - A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
  - B. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
  - C. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier. Conditions including but not limited to:
    - 1. 40 degrees F to 90 degrees F (4 degrees C to 32 degrees C) maximum temperature.
    - 2. Out of sunlight.
    - 3. Clean dry area.
    - 4. Original container.
    - 5. Do not stack boxes over six (6) units high. Excessive weight can damage the film.
    - 6. Relative humidity is below 80 percent.
    - 7. Handle products in accordance with manufacturer's instructions.
    - 8. Total Pre-installation Shelf Life: Apply within 2 years of date of purchase.
- 1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturers for optimum results. Do not install products under environmental conditions outside the manufacturer's absolute limits.

## 1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
- 1.10 WARRANTY
  - A. Manufacturer's Standard Limited Warranty: For materials and workmanship.

## PART 2 – PRODUCTS

- 2.1 MANUFACTURERS
  - A. <u>Basis of Design:</u> 3M Commercial Solutions, which is located at: 3M Center Bldg. 223; St. Paul, MN 55144-1000; Toll Free Tel: 888-650-3497; Tel: 651-737-1081; Fax: 651-737-8241; Email: request info (apeters2@mmm.com); Web: <u>http://www.3m.com/3M/en\_US/architectural-design-</u>us/?utm\_medium=redirect&utm\_source=vanity-url&utm\_campaign=www.3M.com/AMD | <u>http://www.3m.com/3M/en\_US/building-window-solutions-us</u>
  - B. Other acceptable Manufacturers:
    - 1. Designed Film
    - 2. Design Film
    - 3. Substitutions will be considered in accordance with Section 012500 Submittal Procedures.
  - C. Architectural Finish Films:
    - 1. Style: Basis of Design: 3M Fasara Glass Finish (match similar for other manufacturers).
    - 2. Color/Pattern: Architect to select from full range of selections.

#### 2.2 SURFACE PREPARATION

- A. Comply with manufacturers' instructions for surface preparation. Consider these factors in determining the suitability of the Product:
  - 1. Substrate texture affects Product adhesion and application ease.
  - 2. Unless the substrate is very smooth, its texture may be visible through the product.
  - 3. Compounds used to smooth a textured substrate permanently change that substrate.
  - 4. Product removal may damage the substrate or its finish.
  - 5. Application surface conditions affect product adhesion.
  - 6. Ensure that the surface finish has an excellent bond to the substrate area where product will be applied.
  - 7. Repair, prime and paint the substrate, as needed.
  - 8. An adhesion promoter may be required to increase product adhesion.

- 9. Human and environmental conditions affect products.
- 10. Temperature and humidity in recommended range.
- 11. Heating or cooling ducts in proximity.
- 12. Unsealed substrates in front of water sources.
- 13. People or equipment that will be in contact with the product.
- 14. The product may contain a splice. The location of the splices is marked with a tab along the edge of the product. The installer will need to determine the impact of the splice and work around it to make the best use of the material layout.
- 15. Test and prepare application surfaces per instructions in the Installation Guide.
- 16. Use the 3M Wall Adhesion Test to determine the compatibility of the application surface with the Product.
- 17. Use the 3M Enhanced Cleaning Method to ensure that the application surface is ready to receive and hold the product.
- 18. Repair damaged application surfaces per instructions in the Installation Guide

## 2.3 APPLICATION

- A. Do not proceed with installation until all the finished work has been completed in and around the work area.
- B. Measure the application surface and cut film to size with a minimum 1/2 in. extra on all sides for trimming.
- C. Install on application surfaces with no gaps, wire seams, or overlaps. Form smooth, wrinkle-free, bubble-free surface for finished installation.
- D. No exposed joints on corners or other "open" type joints permitted.
- E. Verify patterns prior to material acquisition as some part numbers do not allow three-dimensional forming.
- F. Comply with manufacturers' installation instructions applicable to products and applications

indicated, except where more stringent requirements apply.

G. Remove air bubbles, wrinkles, and blisters. Use approved procedures to prevent the formation of air bubbles, wrinkles, blisters and other defects.

# 2.4 SCHEDULE

- A. Room: Second Floor Recreation Office, Second Floor Office, Lobby Exterior door / glazing. See door schedule, elevations and floor plans for all locations.
- B. Material: Tempered Glass, Existing glazing.
- C. Horizontal Surfaces Exposed to View: Design Category, Product number.

D. Shop Drawing Reference: In addition to original A/E elevations, the installation specialist may be asked to provide elevation views of installation surfaces to confirm design intent upon request.

# 2.5 CLEANING AND PROTECTION

- A. Cleaning methods recommended by architectural surfacing manufacturers for applicable environment.
- B. Protect completed graphic film during the remainder of construction period.
- C. Consult with authorized installation specialist for project specifics.

END OF SECTION 097000

## SECTION 09 91 00 – PAINTING Interior & Exterior

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Painting and finishing of interior and exterior exposed items and surfaces throughout the project, except as otherwise indicated.
  - 2. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of the work.
  - 3. Field painting of exposed bare and covered pipes and ducts, and hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under the mechanical and electrical work, except as otherwise noted.
- B. "Paint", as used herein, is defined as all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- C. Paint all exposed surfaces except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas.
- D. Paint prefinished metal items such as:
  - 1. Door light stops and moldings.
  - 2. Electric panels in finished areas.
  - 3. Prefinished door frames.
  - 4. Door astragals and moldings.
- E. Color Coding and Identification: Is specified in respective sections of Divisions 21, through Division 28.
- F. Colors: As selected.

# 1.3 PAINTING NOT INCLUDED:

- A. The following categories of work are not included as part of the field-applied finish work or are included in other sections of these specifications.
  - 1. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, hollow metal work, and similar items.
  - 2. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing is specified for such items as (but not limited to) metal toilet enclosures, prefinished partition systems, acoustic materials, architectural woodwork and casework,

light fixtures, switchgear and distribution cabinets. Prefinished items to be painted are hereinbefore indicated.

- 3. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
- 4. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting. (Note: Copper tubing and piping is not a finished metal.)
- 5. Operating Parts and Labels:
  - a. Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting.
  - b. Do not paint over code-required labels, such as Underwriters' Laboratories and Factory Mutual, or equipment identification, performance rating, name, or nomenclature plates. Permanently remove all other labels, prior to painting.

## 1.4 QUALITY ASSURANCE:

- A. Product Data: For information only, submit copies of manufacturer's technical information including paint label analysis and application instructions for each material proposed for use.
  - 1. Submit a list of manufacturer's products proposed for use.
  - 2. Upon approval of the list, submit a detailed schedule of each surface to be painted, and include the specific sealer, primer, underbody and finish coats proposed for each such surface.
  - 3. After approval is granted, submit complete color catalog(s) for color selections.
- B. Samples: Submit samples for review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Trade Contractor. Provide a listing of the material and application for each coat of each finish sample.
- C. Maintenance Sample Stock: Provide the Owner with one (1) gallon, air-tight covered, of each applied paint color for future use. Identify each container with the manufacturer's name, number and color designation.
- D. Submit certification that materials proposed herein conform to the above requirements and to the fire test requirements of ASTM E84, Class "A" 0-25 Flame Spread.
  - 1. Flame Spread Rating: Provide materials with ratings in accordance with NFPA #101, "Life Safety Code", 25 or less in exit ways, corridors, stairways, storage rooms or other areas of high hazard; 75 or less elsewhere.
- E. VOC Compliance: Provide LOW VOC materials conforming to the State and local regulations as relating to VOC/VOS requirements at the time of application, and as follows:
  - 1. VOC Compliance: All paints and coatings must comply with Green Seal Testing Program Limits as follows:
    - a. Non-Flat Primer / Paint: 150g/L. VOC Limit
    - b. Flat Primer / Paint: 50g/L. VOC Limit
- F. Mock-Up:

- 1. Before proceeding with the Work of this Section, finish one complete space or item of each color scheme required. Show selected colors, finish textures, materials and workmanship.
- 2. Accepted sample spaces or items will serve as the standard for similar work throughout the project.

## 1.5 DELIVERY AND STORAGE:

- A. Delivery:
  - 1. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and application instructions thereon.
  - 2. Provide labels on each container with the following information:
    - a. Name of title of material.
    - b. Fed. Spec. number, if applicable.
    - c. Manufacturer's stock number.
    - d. Manufacturer's name.
    - e. Contents by volume, for major pigment and vehicle constituents.
    - f. Thinning instructions.
    - g. Application instructions.
- B. Storage:
  - 1. Provide a secure space for the storage of all paint materials and equipment for the exclusive use of this work and maintain and leave it free from fire hazards due to improperly stored rags or thinners.

#### 1.6 JOB CONDITIONS:

- A. Apply water-base paints when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds 85% or to damp or wet surfaces, unless otherwise permitted by the paint manufacturer's printed instructions.
  - 1. Continue painting during inclement weather, if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

# PART 2 - PRODUCTS

- 2.1 COLORS AND FINISHES:
  - A. Painting, surface treatments and finishes are indicated in the "schedules" of the contract documents.

- B. Architect to select paint colors.
  - 1. Provide the necessary compatible base color for the selected finish colors. Should color coverage appear to be a problem, notify the Architect prior to base coat application. Sample areas may be required (approximately four areas of four-square feet each).
  - 2. Use representative colors when preparing samples for review.
- C. Upon completion of the first coat, notify the Architect for his review and approval. This review and approval procedure may be done on a room-by-room basis so as not to impede the progress of the work.
- D. Color Pigments: Pure, non-fading, applicable types to suit the substrates and service indicated.
  - 1. Lead content in the pigment, if any, is limited to contain no more than 0.06% lead, as lead metal based on the total non-volatile (dry-film) of the paint by weight.
- E. Paint Coordination: Provide finish coats, compatible with prime paints used. Review other sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request, furnish information on characteristics of finish materials proposed for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime, as required. Notify the Architect, in writing, of any anticipated problems using specified coating systems with substrates primed by others.

#### 2.2 MATERIAL QUALITY:

- A. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best-grade product will not be acceptable.
- B. Exterior Paint Manufacturers:
  - 1. Sherwin Williams, as specified.
  - 2. Benjamin Moore, as specified.
  - 3. Or equivalent products by the following: PPG Industries or Devoe
- C. Interior Paint Manufacturers:
  - 1. Sherwin-Williams Co. "Harmony" Coating System as specified.
  - 2. Benjamin Moore Company "Eco-Spec", as specified.
  - 3. Or equivalent products by the following:
    - a. PPG Industries "Pure Performance" Low VOC line
    - b. Devoe "Wonder-Pure" Low VOC line
- D. Proprietary names, used to designate colors or materials, are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers.
- E. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer and use only within recommended limits.

#### 2.3 EXTERIOR PAINT SYSTEMS:

A. Provide the following paint systems for the various substrates, as indicated.

B. Ferrous Metal: (including steel doors and frames)

Gloss Finish: (4 mils wet, 1.3 mils dry per coat)

1st Coat - S-W All Surface Enamel Latex Primer, A41W210 (10 mils wet, 5 mils dry) 2nd Coat - S-W A-100 Exterior Latex Gloss, A8 Series 3rd Coat - S-W A-100 Exterior Latex Gloss, A8 Series (4 mils wet, 1.3 mils dry per coat)

Semi-Gloss Finish: (3-5 mils dry per coat)

1st Coat - S-W All Surface Enamel Latex Primer, A41W210 (10 mils wet, 5 mils dry) 2nd Coat - S-W Metalatex Semi-Gloss Coating, B42 Series 3rd Coat - S-W Metalatex Semi-Gloss Coating, B42 Series

First coat not required on items delivered shop primed.

or;

1st coat - Benjamin Moore M07 Universal Metal Primer- M07 2nd coat - Benjamin Moore D.T.M. Acrylic (Semi-Gloss M29) (Gloss M28) 3rd coat - Benjamin Moore D.T.M. Acrylic (Semi-Gloss M29) (Gloss M28)

## 2.4 LOW ODOR - LOW VOC COMPLIANT INTERIOR PAINTS

- A. Coordinate with Finish Schedule for material and colors required.
- B. Gypsum Drywall System (except ceilings):

1st coat - Sherwin-Williams Harmony Interior Latex Primer B11W900 2nd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series 3rd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series

or;

1st coat- Benjamin Moore Eco Spec Interior Latex Primer Sealer-231 2nd coat - Benjamin Moore Eco Spec Interior Latex Eggshell 223 3rd coat- Benjamin Moore Eco Spec Interior Latex Eggshell 223

C. Plaster (except ceilings):

1st coat - Sherwin-Williams PrepRite Classic Primer B28 Series 2nd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series 3rd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series

or;

1st coat- Benjamin Moore Regal First Coat Interior Primer - 216 2nd coat - Benjamin Moore Eco Spec Interior Latex Eggshell 223 3rd coat- Benjamin Moore Eco Spec Interior Latex Eggshell 223

D. Ferrous Metals: (for all exposed to view metal, in finished rooms, including grilles, diffusers, piping, ducts, conduit, metal doors and frames and miscellaneous metals. When concealed from view and in mechanical equipment rooms, spot prime, only):

1st coat - Sherwin-Williams DTM Acrylic Primer/Finish 2nd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series 3rd coat - Sherwin-Williams Harmony Interior Latex Eggshell B9 Series

or;

1st coat - Benjamin Moore M04 Acrylic Metal Primer-M04 2nd coat - Benjamin Moore Eco Spec Interior Latex Eggshell 223 3rd coat- Benjamin Moore Eco Spec Interior Latex Eggshell 223

E. Galvanized/Zinc Coated Metal: (for all exposed to view metal, in finished rooms, including metal decking, ducts, conduit, grilles, diffusers, miscellaneous metals and as indicated on the drawings):

Semi-Gloss Finish (4 mils wet, 1.6 mils dry per coat)

1st Coat - S-W ProCryl Universal Primer, B66-310 Series (110 g/L) 2nd Coat - S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series (0 VOC) 3rd Coat - S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series (0 VOC)

F. Aluminum: (for all exposed to view items, including grilles, diffusers, louvers, ducts, conduit and miscellaneous items not prefinished)

Semi-Gloss Finish (4 mils wet, 1.6 mils dry per coat)

1st Coat - S-W ProCryl Universal Primer, B66-310 Series (110 g/L) 2nd Coat - S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series (0 VOC) 3rd Coat - S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series (0 VOC)

G. Epoxy Systems (Water Base)

Gloss Finish	(2.5 - 3 mils dry per coat)
1st Coat:	S-W Waterbased Catalyzed Epoxy, B70W211/ B60V15
2nd Coat:	S-W Waterbased Catalyzed Epoxy, B70W211/ B60V15
Semi-Gloss Finisl	n (2.5 - 3 mils dry per coat)
1st Coat:	S-W Waterbased Catalyzed Epoxy, B70W211/ B60V25
2nd Coat:	S-W Waterbased Catalyzed Epoxy, B70W211/ B60V25

# PART 3 - EXECUTION

#### 3.1 INSPECTION:

- A. Examine the areas and conditions under which painting work is to be applied and do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Starting painting work will be construed as acceptance of the surfaces and conditions within any area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

## 3.2 PREPARATION:

- A. New Substrates:
  - 1. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as specified, for each particular substrate condition.
    - a. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.
    - b. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.
    - c. Equipment, factory primed, including but not limited to electric panels, in finished areas; grilles; diffusers; and similar equipment not indicated to be painted "electrostatically" shall be dulled by sanding with #00 sandpaper or other approved material prior to receiving finish coats. Remove all sanding residue with watermoistened rags or other approved method.

# 3.3 MATERIALS PREPARATION:

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir the materials before application to produce a mixture of uniform density and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before use.

#### 3.4 APPLICATION:

- A. General:
  - 1. Apply paint in accordance with the manufacturer's directions. Use applicators and techniques best suited for the substrate and type of material being applied.
- B. Apply primer, intermediate and finish coats to not less than the manufacturer's recommended wet film and dry film thicknesses and spreading rates for each of the various types of materials specified.
  - 1. Verify mil thickness, whether wet or dry, by use of recommended gauges.
- C. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to ensure that all surfaces, including edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

- D. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
- E. Paint the back sides of access panels, and removable or hinged covers to match the exposed surfaces.
- F. Finish doors on tops, bottoms and side edges the same as the faces, unless otherwise indicated.
- G. Sand lightly between each succeeding enamel or varnish coat.
- H. Omit the first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.
- I. Scheduling Painting:
  - 1. Apply the first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 2. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- J. Minimum Coating Thickness: Apply each material at not less than the manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.
- K. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to those items exposed to view on the building exterior, in mechanical equipment rooms and in finished spaces.
  - 1. Mechanical items to be painted include, but are not limited to, the following:
    - a. Piping, pipe hangers and supports exposed to view.
    - b. Accessory items, including grilles, diffusers and louvers.
  - 2. Electrical items to be painted include, but are not limited to, the following:
    - a. Conduit and fittings.
    - b. Panels.
    - c. Panel backboards.
- L. Prime Coats: Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others.
  - 1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
  - 2. Apply prime coat to all surfaces including surfaces indicated to receive other finishes.
- M. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable.

- N. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes or other surface imperfections.
  - 1. Provide satin finish for final coats, unless otherwise indicated.
- O. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

#### 3.5 CLEAN-UP AND PROTECTION:

- A. Clean-up: During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday.
  - 1. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
  - 1. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrapping provided by others for protection of their work, after completion of painting operations.
  - 2. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 09 91 00

SECTION 10 14 00 - SIGNAGE

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:1. Dimensional non-illuminated characters.
- B. Related Sections include the following:

#### 1.3 DEFINITIONS

A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
  - 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
  - 2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
- C. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
  - 1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter).
  - 2. Acrylic Sheet: 8 by 10 inches (200 by 250 mm) for each color required.
  - 3. Plastic: 8 by 10 inches (200 by 250 mm) for each color required.
  - 4. Accessories: Manufacturer's full-size unit.
- D. Sign Schedule: Use same designations indicated on Drawings. Architect to confirm.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Warranty: Special warranty specified in this Section.

- 1.6 CLOSEOUT SUBMITTALS
  - A. Maintenance Data: For signs to include in maintenance manuals.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful inservice performance.
- C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- D. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines, ICC/ANSI A117.1 and State Building Code Requirements.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
  - Failures include, but are not limited to, the following:

     Deterioration of embedded graphic image colors and sign lamination.
  - 2. Warranty Period: Five years from date of Substantial Completion.

#### PART 2 - PRODUCTS

#### 2.1 MATERIALS

A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).
1. Thickness: 0.125-inch

#### 2.2 DIMENSIONAL CHARACTERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Take Form
  - 2. Inpro
  - 3. Apco Signs

- C. Characters: Produce characters with smooth flat faces, sharp corners, and precisely formed lines and profiles, free of pits, scale, sand holes, and other defects. Comply with the following requirements.
  - 1. Character Material: Acrylic, Plastic.
  - 2. Thickness: As required by RI Accessibility Code 2009
  - 3. Colors: As selected by Architect from manufacturer's full range of color.
  - 4. Mounting: Concealed mounting and fastening.
  - 5. Lettering: As required by RI Accessibility Code 2009, must contain braille.

#### 2.3 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.
 1. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

#### 2.4 FINISHES, GENERAL

A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

#### 2.5 ACRYLIC SHEET FINISHES

A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for five years for application intended.

#### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, and electrical power are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
  - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.

- Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
  - 1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
  - 2. Hook-and-Loop Tapes: Mount signs to smooth, nonporous surfaces.
- C. Dimensional Characters: Mount characters using standard fastening methods to comply with manufacturer's written instructions for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
  - 1. Projected Mounting: Mount characters at projection distance from wall surface indicated. a. Match existing ADA signage.

#### 3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.
- 3.4 SCHEDULE OF SIGNAGE
  - A. At the minimum the following signs shall be required:
  - B. Room names and numbers with Braille. (Approx. 8" x 8").

END OF SECTION 10 14 00

## SECTION 12 24 13 WINDOW ROLLER SHADES

#### PART 1 GENERAL

- 1.1 SECTION INCLUDES
  - A. Roller shades, manual operation and accessories.
  - B. Shade fabric.
- 1.2 RELATED SECTIONS
  - A. Section 06 Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.
  - B. Section 09 Gypsum Board" Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.

## 1.3 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM G21 and E 2180 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. Cradle to Cradle Products Innovation Institute (C2C):
   1. C2C (DIR) C2C Certified Products Registry.
- C. National Fire Protection Association (NFPA):
   1. NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- D. Window Covering Manufacturers Association (WCMA):
   1. ANSI/WCMA A100.1-2022- Safety of Window Covering Products; 2022.

## 1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: One week prior to commencing work related to this section. Require attendance of all affected installers.
- B. Sequencing:
  - 1. Do not fabricate shades until field dimensions for each opening have been taken with finished conditions in place. "Hold to" dimensions are not acceptable.
  - 2. Do not install shades until final surface finishes and painting are complete.

# 1.5 SUBMITTALS

- A. See Section 013300 Administrative Requirements, for submittal procedures.
- B. Bid Submittal: Information Required with Submittal of Bid: In order to evaluate proposals for integrated lighting control and window shade systems, the Architect requires the following information be submitted prior to the award of the system.

- 1. Bid proposal shall be accompanied with a document that notes all deviations from these specifications on a line-by-line basis.
- C. Product Data: Manufacturer's catalog pages and data sheets for products specified including materials, finishes, dimensions, profiles, mountings, and accessories.
  - Preparation instructions and recommendations. 1.
  - Styles, material descriptions, dimensions of individual components, profiles, features, 2. finishes, accessories, and operating instructions.
  - Storage and handling requirements and recommendations. 3.
  - Mounting details and installation methods. 4.
  - 5. Manufacturer's Instructions: Include storage, handling, protection, examination, preparation, and installation.
  - 6. Project Record Documents: Record actual locations of control system components and show interconnecting wiring.
- D. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.
  - Prepare shop drawings on AutoCad format using base sheets provided electronically 1. by the Architect.
  - Provide location plan showing all manual shade control locations. Cross-reference 2. furniture plans for optimal positioning of chains.
  - 3. Provide elevation drawings showing shade band layout. Indicate any necessary seam or batten locations, and align with horizontal mullions where possible.
- Window Treatment Schedule: For all roller shades. Use same room designations as Α. indicated on the Drawings and include opening sizes and key to typical mounting details.
- Verification Samples: For each finish product specified, one complete set of shade Β. components, unassembled, demonstrating compliance with specified requirements. 4.
  - Shade cloth Sample: Mark face of material to indicate interior faces.
    - Test reports indicating compliance with specified fabric properties. a.
    - Verification Samples: 6 inches (150 mm) square, representing actual materials, b. color and pattern.
- C. Warranty: Provide manufacturer's warranty documents as specified in this Section.

#### 1.6 QUALITY ASSURANCE

- Α. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having iurisdiction.
- Manufacturer Qualifications: Obtain roller shades system through one source from a single Β. manufacturer with a minimum of ten years' experience and minimum of five projects of similar scope and size in manufacturing products comparable to those specified in this section.
- C. Installer for Roller Shade System - Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years' experience in installing products comparable to those specified in this section.
  - Requirements for Roller Shade Installer/Contractor: 1.
    - Roller Shade Hardware, shade fabric and all related controls shall be furnished a. and installed as a complete assembly.

- D. Product Listing Organization Qualifications: Organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- E. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
- F. ShadeCloth Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC9644 and ATCC9645, and E2180.
- G. ShadeCloth Cleanability and Disinfecting: ShadeCloth must meet cleanability and disinfecting requirements via 3<sup>rd</sup> party testing to comply with BIFMA HCF 8.1-2014 standards using chemical solutions compliant with EPA guidelines for use against COVID-19.
- H. Environmental Certification: Submit written certification from the manufacturer, including third party evaluation, recycling characteristics, and perpetual use certification as specified. Initial submittals, which do not include the Environmental Certification will be rejected. Materials that are simply 'PVC free' without identifying their inputs shall not qualify as meeting the intent of this specification and shall be rejected.
- I. Third Party Evaluation: Provide documentation stating the shade cloth has undergone third party evaluation for all chemical inputs, down to a scale of 100 parts per million, that have been evaluated for human and environmental safety. Identify any and all inputs, which are known to be carcinogenic, mutagenic, teratogenic, reproductively toxic, or endocrine disrupting. Also identify items that are toxic to aquatic systems, contain heavy metals, or organ halogens. The material shall contain no inputs that are known problems to human or environmental health per the above major criteria, except for an input that is required to meet local fire codes.
- J. Recycling Characteristics: Provide documentation that the shade cloth can, and is part of a closed loop of perpetual use and not be required to be down cycled, incinerated or otherwise thrown away. Scrap material can be sent back to the mill for reprocessing and recycling into the same quality yarn and woven into new material, without down cycling. Certify that this process is currently underway and will be utilized for this project.
- K. Perpetual Use Certification: Certify that at the end of the useful life of the shade cloth, that the material can be sent back to the manufacturer for recapture as part of a closed loop of perpetual use and that the material can and will be reconstituted into new yarn, for weaving into new shade cloth. Provide information on each shade band indicating that the shade band can be sent back to the manufacturer for this purpose.

# 1.7 MOCK-UP

- A. Provide a mock-up of one roller shade assembly for evaluation of mounting, appearance and accessories.
  - 1. Locate mock-up in window designated by Architect.
  - 2. Mockup Size: Full size.
  - 3. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
  - 4. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
  - 5. Do not proceed with remaining work until, mock-up is accepted by Architect.
  - 6. Retain mock-up during construction as a standard for comparison with completed work.
  - 7. Do not alter or remove mock-up until work is completed or removal is authorized.

8. Full-sized mock-up will become the property of the Owner to be used for spare parts.

# 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in factory-labeled packages, marked with manufacturer and product name, fire-testresponse characteristics, and location of installation using same room designations indicated on Drawings and in Window Treatment Schedule.
- B. Store and handle products per manufacturer's recommendations.

## 1.9 PROJECT CONDITIONS

A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### 1.10 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating, transferrable warranty for interior shading.
  - 1. Shade Hardware 10 years unless otherwise indicated:
  - 2. Standard Shade cloth: Manufacturer's standard 25-year warranty.

## PART 2 PRODUCTS

## 2.1 MANUFACTURERS

- A. Acceptable Manufacturer for Window Shade Control System as basis of design, performance and warranty. Basis of Design:
  - Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; ASD Tel: 718-729-2020; Fax: 718-729-2941; Email: marketing@mechoshade.com; Web: www.mechoshade.com. For your local Mecho rep: <u>https://www.mechoshade.com/finda-rep/</u>
- Requests for substitutions will be considered in accordance with provisions of Section 013300.

## 2.2 APPLICATIONS/SCOPE

- A. Roller Shade Schedule:
  - 1. Shade Type: Manual operating, chain drive, sunscreen roller and room darkening opaque double roller shades and related mounting systems and accessories as indicated on drawings.
  - 2. ADA Compliance: All spaces requiring full ADA compliance to be motorized with an accessible wall switch.
  - 3. CPSC Compliance: All manually operated window coverings with accessible cords, chains, continuous loop cords, etc. shall meet all current Federally mandated CPSC (Consumer Products Safety Commission) safety standards at time of manufacturing. Depending on the product type, additional hardware components may be required and added to meet new regulatory compliant anti-ligature requirements.
  - 4. WCMA Compliance: Chain tensioning device complying with ANSI/WCMA A100.1-2022 manufacuted on every manual roller shade.

# 2.3 ROLLER SHADES, MANUAL OPERATION AND ACCESSORIES

- A. Shade System; General:
  - 1. Components capable of being removed or adjusted without removing mounted shade brackets, or cassette support channel.
  - 2. Smoothly operation raising or lowering shades.
  - 3. Cradle-to-Cradle certified and listed in C2C (DIR).
  - 4. Environmental Product Declaration (EPD): Published disclosure of product's environmental impacts based on a full Life Cycle Assessment (LCA). Manufacturer must have EPD certification by independent 3<sup>rd</sup> party evaluation service.
- B. Basis of Design: MechoShade Systems LLC.
  - 1. Description: Manually operated fabric window shades.
    - a. Shade Type: Double Roller.
    - b. Universal drive capability to offset drive chain for reverse or regular roll shades.
    - c. Drop Position: Regular roll.
    - d. Mounting: Window Jamb Mounting.
    - e. Size to suit existing window opening
    - f. Fabric: As indicated under Shade Fabric article.
  - 2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
    - a. Material: Steel, 1/8 inch (3 mm) thick.
    - b. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
      - 1) Light-Filtering Fabric: Room-side of opening.
      - 2) Room-Darkening Fabric: Glass-side of opening.
      - 3) Operating chain pulls for both fabrics configured for the same side of the window.
      - 4) Operating chain pulls for each fabric configured for opposite sides of the window.
    - c. Multiple Shade Band Operation: Provide hardware as necessary to operate more than one shade band using a single clutch operator.
    - d. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
      - 1) Maximum Offset: Eight degrees on each side for a 16 degree total offset.
  - 3. Roller Tubes:
    - a. Material: Extruded aluminum.
    - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
    - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
    - d. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
  - 4. Hembars: Designed to maintain bottom of shade straight and flat.
    - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
    - b. Style: Exposed aluminum bottom bar with matching finials.
      - 1) Profile: Rectangular.
      - 2) Color: To be selected by Architect from manufacturer's standard color
    - c. Style: To be selected by Architect

- d. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
- 5. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
  - a. Heavy-duty, 1/8" steel mounting bracket and integrated steel brake, clutch and sprocket assembly rigidly affix the shade support and user control to the building structure fully independent of the roller tube components.
  - b. Permanently lubricated maintenance-free brake assembly employs an oilimpregnated steel hub with wrapped spring clutch.
  - c. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
  - d. Direct drive clutch requires no interstitial gear stages or plastic parts between the building structure and clutch ensuring reliable operation across the full range of shade sizes.
  - e. Maximum shade hanging weight of 18 pounds (8.2 kg).
- 6. Drive Chain: Continuous loop stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength. Provide upper and lower limit stops.
  - a. Chain Tensioner: Chain tensioning device complying with ANSI/WCMA A100.1-2022.
  - b. Limit stops: Bead stops affixed to the chain maintain consistent shadeband alignment at the top and bottom of shade travel across multiple shades, and help prevent shade damage resulting from unmanaged user control.
- 7. Accessories:
  - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
    - 1) Finish: Baked enamel.
      - a) Color: to be selected.
    - 2) Finish: Fabric to be selected by Architect.
    - 3) Can be installed across two or more shade bands in one piece.
    - 4) Single Fascia: Accommodate regular roll shades.
    - 5) Two-Piece Double Fascia: Front and rear double fascia.
    - 6) Profile: Square.
    - 7) Configuration: Continuous, fascia extends past continuous bracket.
  - b. Room-Darkening Channels: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.

# 2.4 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
  - 1. Vertical Dimensions: Fill Opening from Head to Sill: 1/2 inch (13 mm) space between bottom bar and window sill.
  - 2. Horizontal Dimensions: Inside Mounting.
    - a. Fill openings from jamb to jamb. No light gap.

## 2.5 SHADE FABRIC

- A. Basis of Design: Shade fabric as manufactured by MechoShade Systems LLC.
  - 1. Solar Shadecloths:
    - a. Fabric: Acoustiveil: 0890 series. 0-1 percent open. PVC-Free.

- 1) NRC Rating: 0.60.
- 2) SAA Rating: 0.64.
- 3) Cradle to Cradle Material Health Certificate:
  - a) Achievement Level: Bronze.
- 4) Declare label.
- 5) Environmental Product Declaration (EPD): Published disclosure of product's environmental impacts based on a full Life Cycle Assessment (LCA). Manufacturer must have EPD certification by independent 3<sup>rd</sup> party evaluation service.
- 2. Blackout Shadecloths:
  - a. Fabric: Equinox Blackout: 0100 series. Opaque. PVC-Free.
    - 1) NRC Rating: 0.05.
    - 2) SAA Rating: 0.05.
    - Environmental Product Declaration (EPD): Published disclosure of product's environmental impacts based on a full Life Cycle Assessment (LCA). Manufacturer must have EPD certification by independent 3<sup>rd</sup> party evaluation service.
  - b. Color: Selected from manufacturer's standard colors.
- 3. Performance Requirements:
  - a. Flammability per NFPA 701: Pass. Large or small scale test.
  - b. Fungal Resistance: No growth when tested per ASTM G21.
  - c. Cleanability and Disinfecting: ShadeCloth must meet cleanability and disinfecting requirements via 3<sup>rd</sup> party testing to comply with BIFMA HCF 8.1-2014 standards using chemical solutions compliant with EPA guidelines for use against COVID-19.
- 4. Fabrication:
  - a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
  - b. Battens: Manufacturer's standard material, full width of shade, and enclosed in welded shade fabric pocket; locate as indicated on drawings.
  - c. Seams for Railroaded Fabric: Manufacturer's standard seam; locate as indicated on drawings.
  - d. Welded Zipper Edge: Full height on both sides of fabric ensuring smooth operation within ShadeLoc channels.

# PART 3 EXECUTION

# 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify the Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

# 3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by the manufacturer for achieving best result for substrate under the project conditions.
- C. Coordinate with window installation and placement of concealed blocking to support shades.

### 3.3 INSTALLATION

- A. Contractor Furnish and Install Responsibilities:
  - 1. Window Covering Contractor (WC) shall provide an onsite, Project Manager, and shall be present for all related jobsite scheduling meetings.
  - 2. WC shall supervise the roller shade installation and setting of intermediate stops of all shades.
  - 3. WC shall be responsible for field inspection on an area-by- area and floor-by-floor basis during construction to confirm proper mounting conditions per approved shop drawings.
  - 4. Verification of Conditions: examine the areas to receive the work and the conditions under which the work would be performed and notify the General Contractor and Owner of conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Commencement of installation shall constitute acceptance of substrate conditions by the installer.
  - 5. WC shall provide accurate to 0.0625" inch (1.5875mm); field measurements for custom shade fabrication on the Roller Shades manufacturers input forms.
  - 6. WC Installer shall install roller shades level, plumb, square, and true according to manufacturer's written instructions, and as specified here in. Blocking for roller shades installed under the contract of the interior General Contractor shall be installed plumb, level, and fitted to window mullion as per interior architect's design documents and in accordance with industry standard tolerances. The horizontal surface of the shade pocket shall not be out-of-level more than 0.625" (15.875mm) over 20 linear feet (6.096 meters)
  - 7. Shades shall be located so the shade band is not closer than 2 inches (50 mm) to the interior face of the glass. Allow proper clearances for window operation hardware.
  - 8. Adjust, align and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
  - 9. Installer shall set Upper and Lower limits of all manual shade bands and assure alignment in accordance with the above requirements.
  - 10. Clean roller shade surfaces after installation, according to manufacturer's written instructions.
  - 11. WC shall train Owner's maintenance personnel to adjust, operate and maintain roller shade systems.
    - a. Use operation and maintenance manual as a reference, supplemented with additional training materials as required.

## 3.4 PROTECTION AND CLEANING

- A. Protect installed products until completion of the project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
  - 1. Clean soiled shades and exposed components as recommended by manufacturer.
    - 2. Replace shades that cannot be cleaned to "like new" condition.

### END OF SECTION 12496

### SECTION 270000 – GENERAL COMMUNICATIONS REQUIREMENTS

PART 1 – GENERAL

#### 1.1 SUMMARY

- A. The scope of work specified by these documents shall result in the provision, installation and testing of the following Telecommunications Communications infrastructure, systems and equipment.
- B. Sustainable Design Intent

Comply with project requirements intended to achieve sustainable design, measured and documented according to LEED Green Building Rating System of the US Green Building Council. Refer to section 0108113, SUSTAINABLE DESIGN REQUIREMENTS for certification level and certification requirements.

- 1. All Voice and Data Wiring
  - a. Contractor to provide all new CAT 6 cabling at all telecom outlet locations. Refer to drawings for outlet locations.
    - 1) All new CAT 6 cables shall be terminated onto existing patch panels, if existing space is not available, contractor to provide new CAT 6 patch panels and labeled.
    - 2) Mount new patch panels within the existing wall mount rack
- 2. Audio / Video Displays (wiring only)
  - a. Contractor to provide all new CAT 6 cabling at all telecom outlet locations. Refer to drawings for outlet locations.
- 3. Gateway for Wireless Locks(wiring only).
  - a. All Gateways locations are to receive new CAT6 cabling.
- 4. Patch Cords
  - 1) Provide (1) 7' CAT6 patch cord for each device end, and (1) 12" cord for the patch panel end.
  - 2) Provide (2) patch cords for each new terminated patch panel port.
- B. Systems shall utilize digital technology to integrate the following systems into a single network linking them to a central site:
  - 1. LAN/Wi-Fi Systems
    - a. Locally, the facility will be provided with a Local Area Network for all local data and video connectivity.
    - b. Gateways shall be provided by the Security Contractor. Telecom Contractor to provide a minimum of 20' of cable slack at the device end.
- C. Telephone system (VoIP)
  - 1. The telephone system shall be furnished, installed and programmed by the owner.
- D. These systems shall be integrated by means of an in building Network of cables.
  - 1. Cable Infrastructure

- a. All technology cabling for the new facility will be integrated with the data network and telephone system, utilizing Category 6 for all cabling.
- Based on distance limitations from MDF to the devices, the cabling distance standard of 290' for data networks shall be adhered to. If any cabling is over 295 feet Game Changer 22AWG 4 pair cable shall be installed
- 3. All wiring will be in stub-ups or free air to J-hooks.

NOTE: The Telecommunications Contractor shall ensure that the General Contractor and Painting Contractor acknowledge that painting of or over spray any single or group of 4 pair horizontal telecommunications Category 6 cable is not allowed. Any painted or over sprayed cable(s) shall be replaced at the telecommunications and/or painting contractor's expense. Painted Cable will not be covered as part of an extended warranty. Painted cable in addition to obscuring the print legend may act as an accelerant or create an additional smoke hazard in the event of a fire and as such this is considered a life safety issue.

# 1.3 SUMMARY OF WORK

A. Associated "T" drawing series attached

# 1.4 REGULATIONS AND CODE COMPLIANCE

- A. All work and materials shall conform to and be installed, inspected and tested in accordance with the most current governing rules and regulations of federal, state and local governmental agencies.
- B. The following is a list of codes and standards that will apply to this project:
  - 1. Federal Occupational Safety and Health Administration OSHA.
  - 2. National Life Safety Code, NFPA 101.
  - 3. National Electrical Code (NEC), NFPA 70
  - 4. Underwriters Laboratory (UL).
  - 5. Factory Mutual and/or Owner's Insurance Carrier.
  - 6. ANSI/TIA Telecommunications Building Wiring Standards (Most current addition, revision and addenda), including, but limited to, the following compilation series of documents: 568, 570, 598, 606, 607, 758, , FIP 174, FIP175, FIP176,
  - 7. BICSI Telecommunications Distribution Methods Manual, Telecommunications Cabling Installation Manual, Customer-Owned Outside Plant Manual, LAN and Internetworking Design Manual.
  - 8. IEEE Standards.
  - 9. IEEE-SA National Electrical Safety Code (NESC)
  - 10. Federal Communications Commission.
  - 11. NEMA National Electrical Manufacturers' Association
  - 12. CSA Canadian Standards Association
  - 13. Owner's Environmental Health and Safety Standards.
  - 14. Owner's Construction Standards.
  - 15. ADA, Americans with Disabilities Act.

#### 1.5 GLOSSARY

- A. ANSI: American National Standards Institute
- B. ASME: American Society of Mechanical Engineers
- C. ASTM: American Society for Testing Materials
- D. BICSI: Building Industry Consulting Services International
- E. CSA: Canadian Standards Association
- F. FCC: Federal Communications Commission
- G. FM: Factory Mutual Insurance Company
- H. IEEE: Institute of Electrical and Electronics Engineers
- I. IRI: Industrial Rick Insurers
- J. ISO: International Standards Organization
- K. NEC: National Electrical Code (latest applicable edition
- L. NEMA: National Electrical Manufacturers' Association
- M. NESC: National Electrical Safety ode
- N. NFPA: National Fire Protection Association
- O. OSHA: Occupational Safety and Health Administration
- P. TIA: Telecommunications Industry Association
- Q. UFPO: Underground Facilities Protective Organization
- R. UL: Underwriter's Laboratories, Inc.

### 1.6 DEFINITIONS

- A. Approved / Approval: Written permission to use a material or system.
- B. As Called for: Materials, equipment including the execution specified/shown in the contract documents.
- C. Code Requirements: Minimum requirements
- D. Concealed: Work installed in pipe and duct shafts, chases or recesses, inside walls, above ceilings, in slabs or below grade.
- E. Design Equipment: Refer to the article, BASIS OF DESIGN.
- F. Design Make: Refer to the Article, BASIS OF DESIGN.

- G. Equal or Equivalent: Equally acceptable as determined by Owner's Representative.
- H. Exposed: Work not identified as concealed.
- I. Final Acceptance: Owner acceptance of the project from Contractor upon certified by Owner's Representative.
- J. Furnish: Supply and deliver to installation location.
- K. Furnished by Others: Receive delivery at job site or where called for and installed.
- L. Inspection: Visual observations by Owner's site Representative.
- M. Install: Mount and connect equipment and associated materials ready or use.
- N. Labeled: Refers to classification by a standards agency.
- O. Make: Refer to the article, BASIS OF DESIGN.
- P. Or Approved Equal: Approved equal or equivalent as determined by Owner's Representative.
- Q. Owner's Representative: Mast Construction
- R. Prime Professional: Architect or Engineer having a contract directly with the Owner for professional services.
- S. Provide: Furnish, install and connect ready for use.
- T. Relocate: Disassemble, disconnect, and transport equipment to new locations, then clean, test, and install ready for use.
- U. Replace: Remove and provide new item.
- V. Review: A general contractual conformance check of specified products. W. Roughing: Pipe, duct, conduit, cabling, equipment layout and installation.
- W. Satisfactory: As specified in contract documents.
- X. Site Representative: Construction Manager or Owner's Inspector at the work site.
- Y. Refer to General Conditions of the Contract for additional definitions.

### 1.7 INTENT OF DRAWINGS

- A. The drawings are diagrammatic, unless detailed dimensioned drawings are included. Drawings show approximate locations of equipment, and fixtures. Exact locations are subject to the approval of the Owner's Representative.
- B. The Contractor should verify all dimensions locating the work and its relation to existing work, all existing conditions and their relation to the work and all man-made obstructions and conditions, etc. affecting the completion and proper execution of the work as indicated in the Contract Documents.

- C. Related Documents
  - 1. Drawings, General Conditions, and Special Conditions related to this project are found in this Division, as well as the other Divisions included in the Contract Documents.

## PART 2 - PRODUCTS

## 2.1 EQUIPMENT AND MATERIALS MINIMUM REQUIREMENTS:

- A. Materials requirements:
  - 1. All equipment and material for which there is a listing service shall bear a UL label.
  - 2. Electrical equipment and systems shall meet UL Standards and requirements of the NEC and CSA. This listing requirement applies to the entire assembly. Any modifications to equipment to suit the intent of the specifications shall be performed in accordance with these requirements.
  - 3. Equipment shall meet all applicable FCC Regulations
  - 4. All materials, unless otherwise specified, shall be new and be the standard products of the manufacturer. Used equipment or damaged material will be rejected.
  - 5. The listing of a manufacturer as "acceptable" does not indicate acceptance of a standard or catalogued item of equipment. All equipment and systems must conform to the Specifications and meet the quality of the design make.
  - 6. Where applicable, all materials and equipment shall bear the label and listing of Underwriters Laboratory of Factory Mutual. Application and installation of all equipment and materials shall be in accordance with such labeling and listing.

# 2.2 CABLES

- A. Any cable associated with this Contract, passing through two or more floors shall be suitable, listed by a Nationally Recognized Testing Laboratory (NRTL) and marked for use in a riser or plenum application. Riser cable shall minimally be CMR or OFNR rated per the National Electrical Code and shall meet all local and state codes.
- B. Any cable associated with this Contract shall be rated, listed by a Nationally Recognized Testing Laboratory (NRTL) and marked for use in a plenum application, regardless if the ceiling is a ducted return air plenum or not. Cable shall be CMP rated per the National Electrical Code and shall meet all local and state codes.
- C. Voice copper backbone cables, if required, shall be twisted 24 AWG., contain a corrugated aluminum shield, be of the size indicated on the drawings and have the proper jacket classification per the NEC.

### 2.3 FACTORY ASSEMBLED PRODUCTS

- A. Provide maximum standardization of components to reduce spare part requirements.
- B. Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit.
  - 1. All components of an assembled unit need not be products of same manufacturer.

- 2. Constituent parts, which are alike, shall be product of a single manufacturer.
- 3. Components shall be compatible with each other and with the total assembly for intended service.
- C. Components of equipment shall bear manufacturer's name or trademark, model number and serial number on a nameplate securely affixed in a conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment.
- D. Major items of equipment that serve the same function must be the same make and model. Exception will be permitted if performance requirements cannot be met.

# 2.4 COMPATABILITY OF RELATED EQUIPMENT

- A. Equipment and materials installed shall be compatible in all respects with other items being furnished and with existing items so that a complete and fully operational system will result.
- B. Provide maximum standardization of components to reduce spare part requirements.
- C. Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit.
  - 1. All components of an assembled unit need not be products of same manufacturer.
  - 2. Constituent parts that are alike shall be product of a single manufacturer.
  - 3. Components of equipment shall bear manufacturer's name or trademark, model number and serial number on a nameplate securely affixed in a conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment.

### 2.5 LIFTING ATTACHMENTS

A. Equipment should have suitable lifting attachments to enable equipment to be lifted in its normal position. Lifting attachments shall withstand any handling conditions that might be encountered without bending or distortion of shape, such as rapid lowering and braking of load.

### 2.6 MISCELLANEOUS SUPPORTS

- A. Metal bars, plates, tubing, etc. shall conform to the following ASTM standards:
  - 1. Steel plates, shapes, bars, and grating ASTM A 36
  - 2. Cold-Formed Steel Tubing ASTM A 500
  - 3. Hot Rolled Steel Tubing ASTM A 500
  - 4. Steel Pipe ASTM A 53, Schedule 40, welded
- B. Metal Fasteners shall be Zinc-coated (type, grade and class as required)

### 2.7 FIRESTOPPING

A. Firestopping for Openings through Fire and Smoke Rated Walls and Floor Assemblies shall be listed or classified by an approved independent testing laboratory for "Through-Penetration Firestop Systems." The system shall meet the requirements of "Fire Tests of Through-Penetration Firestops" designated ASTM E814.

- B. Inside of all conduits, the firestop system shall consist of a dielectric, water resistant, nonhardening, permanently pliable/re-enterable putty along with the appropriate damming or backer materials (where required). The sealant must be capable of being removed and reinstalled and must adhere to all penetrants and common construction materials and shall be capable of allowing normal wire/cable movement without being displaced.
- C. All conduit and sleeve openings shall be waterproofed or fireproofed in compliance with Fire Codes. Strict adherence to National and State Fire Codes, particularly firestopping will be required.
- D. All openings remaining around and inside all conduit, sleeves and cable penetrations to maintain the integrity of any fire rated wall, ceiling, floor, etc. shall be patched.
- E. All building conduits and sleeves installed and/or used under this contract shall be firestopped, or re- firestopped, upon cable placement through such passageways.
- F. Manufacturer's recommended installation standards must be closely followed (i.e. minimum depth of material, use of ceramic fiber and installation procedures).
- G. Provide firestop system seals at all locations where conduit, fiber, cable trays, cables/wires, and similar utilities pass through or penetrate fire rated wall or floor assembly. Provide firestop seal between sleeve and wall for drywall construction.
- H. The minimum required fire resistance ratings of the wall or floor assembly shall be maintained by the firestop system. The installation shall provide an air and watertight seal.
- I. The methods used shall incorporate qualities that permit the easy removal or addition of conduits or cables without drilling or use of special tools. The product shall adhere to itself to allow repairs to be made with the same material and permit the vibration, expansion and/or contraction of any items passing through the penetration without cracking, crumbling and resulting reduction in fire rating. Typical rating:
  - 1. Floors 3 hours
  - 2. Corridor walls 2 hours
  - 3. Offices  $\frac{3}{4}$  hour
  - 4. Smoke partitions  $\frac{3}{4}$  1 hour
- J. Provide firestop pillows for existing cable tray penetrations through firewalls.

# 3. EXECUTION

### 3.1 ROUGH-IN

A. Due to small scale of drawings, it is not possible to indicate all offsets, fittings, changes in elevation, etc. Verify final locations for installation with field measurements and with the equipment being connected. Verify exact location and elevations at work site prior to any rough in work. If field conditions, details, changes in equipment or shop drawing information require a significant change to the original documents, contact the owner's representative for approval before proceeding.

- B. All equipment locations shall be coordinated with other trades, other renovation projects, and existing conditions to eliminate interference with required clearances for equipment maintenance and inspection.
  - 1. Coordinate work with other trades, other renovation projects, and existing conditions to determine exact routing of all cable tray, hangers, conduit, etc., before fabrication and installation. Coordinate with Technology Drawings. Verify with Owners Representative exact location and mounting height of all equipment in finished areas, such as equipment racks, communication and electrical devices. Coordinate all work with existing Architecture.
  - 2. Where more than one trade is involved in an area, space or chase, all shall cooperate and install their own work to utilize the space equally between them in proportion to their individual requirements. There will be no priority schedule for trades. If, after installation of any equipment, piping, ducts, conduit, and boxes, it is determined that ample maintenance and passage space has not been provided, rearrange work and/or furnish other equipment as required for ample maintenance space. Any changes in the size or location of the material or equipment supplied or proposed, which may be necessary in order to meet field conditions or in order to avoid conflicts between trades, shall be brought to the immediate attention of the Owner's Representative and approval received before such alterations are made.
- C. Provide easy, safe, and code mandated clearances at equipment racks and enclosures, and other equipment requiring maintenance and operation.

# 3.2 CUTTING AND PATCHING

A. Cut and drill from both sides of walls and/or floors to eliminate splaying. Patch adjacent existing work disturbed by installation of new work including insulation, walls and wall covering, ceiling and floor covering, other finished surfaces. Patch and/or paint openings and damaged areas equal to existing surface finish. Cut openings in prefabricated construction units in accordance with manufacturer's instructions.

### 3.3 CONCEALMENT

A. Use existing conduit and surface raceway where possible and practicable. Conceal all contract work above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, notify Owner's Representative before starting that part of the work and install only after his review. In areas with no ceilings, install only after Owner's Representative reviews and comments on arrangement and appearance.

### 3.4 CHASES

- A. General
  - 1. Field verifies for correct size and location for all openings, recesses and chase.
  - 2. Assume responsibility for correct and final location and size of such openings.
  - 3. Rectify improperly sized, improperly located or omitted chases or openings due to faulty or late information or failure to check final location.
  - 4. Correct, by drilling, omitted or improperly located sleeves. Assume responsibility for all work and equipment damaged during course of drilling. Cap or firestop all unused conduits and sleeves.
  - 5. Provide angle iron frame where openings are required for contract work.

- 6. Seal voids in fire rated assemblies with a firestopping seal system to maintain the fire resistance of the assembly. Provide 18 gauge-galvanized sleeves at fire rated assemblies. Extend sleeves 2" above floors.
- 7. In wall openings, drill or cut holes to suit. Provide 18 gauge galvanized sleeves at shafts and fire rated assemblies. Provide firestopping seal between sleeves and wall in drywall construction. Provide firestopping similar to that for floor openings.

## 3.5 WATERPROOFING

- A. The Contractor shall seal all foundation penetrating conduits and all service entrance conduits and sleeves to eliminate the intrusion of moisture and gases into the building. This requirement also includes spare conduits.
- B. Spare conduits shall be plugged with expandable plugs.
- C. All service entrance conduits through building shall be sealed or resealed upon cable placement.
- D. Conduits with cables in them shall be permanently sealed by firmly packing the void around the cable with oakum and capping with a hydraulic cement or waterproof duct seal.

# 3.6 SUPPORTS

A. Provide required supports, beams, angles, hangers, rods, bases, braces, straps, struts, and other items to properly support contract work. Supports shall meet the approval of the Owner's Representative. Modify studs, add studs, add framing, or otherwise reinforce studs in metal stud walls and partitions as required to suit contract work. If necessary, in stud walls, provide special supports from floor to structure above. For precast Panels/Planks and Metal Decks, support communication work as determined by manufacturer and Owner's Representative. Provide heavy gauge steel mounting plates for mounting contract work. Mounting plates shall span two or more studs. Size, gauge, and strength of mounting plates shall be sufficient for equipment size, weight, and desired rigidity.

### 3.7 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate ordering and installation of all equipment with long lead times or having a major impact on work by other trades so as not to delay the job or impact the schedule.
- B. Where mounting heights are not detailed or dimensioned, install systems, materials and equipment to provide the maximum headroom possible.
- C. Set all equipment to accurate line and grade, level all equipment and align all equipment components.
- D. Provide all scaffolding, rigging, hoisting and services necessary for erection and delivery of equipment and apparatus furnished into the premises. These items shall be removed from premises when no longer required.
- E. No equipment shall be hidden or covered up prior to inspection by the owner's representative. All work that is determined to be unsatisfactory shall be corrected immediately.

F. All work shall be installed level and plumb, parallel and perpendicular to other building systems and components.

# 3.8 IMPLEMENTATION

A. The contractor shall provide and install all hardware, software, connections and appurtenances required for fully operational systems.

END OF SECTION 270000

## SECTION 270526 – GROUNDING AND BONDING

## PART 1 - GENERAL

### 1.1 SCOPE OF WORK

- A. This document describes the products and execution requirements relating to furnishing and installing Grounding/Earthing and Bonding for Communications Systems.
- B. This section includes minimum requirements for the following:
  - 1. Grounding/Earthing System.
  - 2. Telecommunications Grounding Busbar (TGB).
  - 3. Telecommunications Main Grounding Busbar (TMGB).
  - 4. Telecommunications Bonding Backbone (TBB).
  - 5. Rack Grounding/Earthing and Bonding.
- C. All cables and related terminations, support and grounding/earthing hardware shall be furnished, installed, wired, tested, labeled, and documented by the General Contractor as detailed in this document and on the drawings.
- D. Product specifications, general design considerations, and installation guidelines are provided in this document. Quantities of grounding/earthing products, typical installation details and cable routing are provided on the drawings. If this document is in conflict, with the drawings the drawings take precedence. The successful vendor shall meet or exceed all requirements for the cable system described in this document.

### 1.2 REGULATORY REFERENCES

- A. The following industry standards are the basis for the grounding/Earthing and bonding system described in this document.
  - 1. TIA/EIA
    - a. TIA-942 -A Telecommunications Infrastructure Standard for Data Centers
    - b. ANSI-TIA-607-E Commercial Building Grounding/Bonding Requirements
    - c. TIA606-C- Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
  - 2. IEEE
    - a. STD 1100 IEEE Recommend Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book)
  - 3. NFPA
    - a. NFPA-70 National Electric Code (NEC)
- B. The most recent versions of all documents apply to this project. If there is a conflict between applicable documents, the order above shall dictate the order of precedence in resolving the issue unless an enforceable local or national code is in effect.

#### 1.3 QUALITY ASSURANCE

- A. General Contractor Qualifications:
  - 1. The General Contractor shall submit references and other related evidence of installation experience for a period of three years prior to the issue date of this Specification.
  - All work shall be supervised on-site by a BICSI Registered Communications Distribution Designer (RCDD). Person must demonstrate knowledge and compliance with all BICSI, TIA, UL, and NEC standards and codes. General Contractor shall submit proof of RCDD designation.
- B. Provided products shall meet the following requirements: Items of the same classification shall be identical. This requirement includes equipment, assemblies, parts, and components.
- C. Assure that the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.

### 1.4 DEFINITIONS

- A. Bonding The permanent joining of metallic parts to form an electrically conductive path that will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.
- B. Common Bonding Network (CBN) The principal means for affecting bonding and earthing inside a building.
- C. Ground/Earth A conducting connection, whether intentional or incidental, by which an electric circuit or equipment is connected to earth, or to some conducting body of relatively large extent that serves in place of the earth.
- D. Retrofit Rack Grounding/Earthing The application of grounding/earthing products and technology where equipment is already deployed and functioning.

### 1.5 OVERVIEW

- A. The purpose of the grounding/earthing system is to create a low impedance path to earth ground for electrical surges and transient voltages. Lightning, fault currents, circuit switching (motors turning on and off), and electrostatic discharge are common causes of these surges and transient voltages. An effective grounding/earthing system minimizes the detrimental effects of these electrical surges, which include degraded network performance and reliability and increased safety risks.
- B. The grounding/earthing system must be intentional, visually verifiable, adequately sized to handle expected currents safely, and directs these potentially damaging currents away from sensitive network equipment. As such, grounding/earthing must be purposeful in its design and installation.
- C. Four issues require special consideration:
  - 1. Although AC powered equipment typically has a power cord that contains a ground/earth wire, the integrity of this path cannot be easily verified. Thus, many equipment manufacturers require grounding/earthing above and beyond that which is specified by

local electrical codes, such as the National Electrical Code, etcetera. Always follow the grounding/earthing recommendations of the manufacturer when installing equipment.

- 2. While the building steel and metallic water piping must be bonded to the grounding/earthing system for safety reasons, neither may be substituted for the telecommunications bonding backbone (TBB).
- 3. Electrical continuity throughout each rack or cabinet is required to minimize safety risks. Hardware typically supplied with bolt together racks is not designed for grounding/earthing purposes.
- 4. Additionally, most racks are painted. Paint is an insulator. Unless rack members are deliberately bonded, continuity between members is incidental, and in many cases, unlikely.
- D. Any metallic component that is part of a data center or telecommunications room, including equipment, racks, ladder racks, enclosures, cable trays, etc. must be bonded to the grounding/earthing system with a 1 ohm resistance between 2 points.

# 1.6 WORKMANSHIP

- A. The ground/earth system must be designed for high reliability. Therefore, the grounding/earthing system shall meet following criteria:
- B. Local electrical codes shall be adhered to.
  - 1. The grounding/earthing system shall comply with ANSI/TIA-942-A and J-STD-607-C.
  - 2. All grounding/earthing conductors shall be copper.
  - 3. Lugs, HTAPs, grounding strips, and busbars shall be UL Listed and made of premium quality tin-plated electrolytic copper that provides low electrical resistance while inhibiting corrosion. Antioxidant shall be used when making bonding connections in the field.
  - 4. Wherever possible, two-hole lugs shall be used because they resist loosening when twisted (bumped) or exposed to vibration. All lugs shall be irreversible compression and meet NEBS Level 3 as tested by Telcordia. Lugs with inspection windows shall be used in all non-corrosive environments so that connections may be inspected for full conductor insertion (battery rooms are an exception where windowless lugs may be used).
  - 5. Die index numbers shall be embossed on all compression connections to allow crimp inspection.
  - 6. Cable assemblies shall be UL Listed and CSA Certified. Cables shall be a distinctive green or green/yellow in color, and all jackets shall be UL, VW-1 flame rated.

# PART 2 - PRODUCTS

# 2.1 GROUNDING/EARTHING AND BONDING

A. The Telecommunications Grounding Busbar (TGB) in each telecommunications space will be grounded/earthed to the Telecommunications Main Grounding Busbar (TMGB) located at the service entrance. The gauge of the connecting ground/earth cable, known as the Telecommunications Bonding Backbone (TBB) will follow J-STD-607-A guidelines, as is shown in the table below.

1.

Sizing of the TBB	
TBB Length in Linear meters (feet)	TBB Size (AWG)
Less than 4 (13)	6
4-6 (14-20)	4
6-8 (21-26)	3
8-10 (27-33)	2
10-13 (34-41)	1
13-16 (42-52)	1/0
16-20 (53-66)	2/0
Greater than 20 (66)	3/0

B. The TMGB will be bonded to building steel and grounded/earthed to the electrical service ground according to BICSI TDM Manual and J-STD-607-C guidelines. Local codes may supersede these requirements. In telecommunications spaces with only one rack, the rack jumper cable can be connected directly to the TGB.

Cable Sizes for Other Grounding/Earl	
Purpose	Copper Code Cable Size
Aisle grounds (overhead or under floor) of the common bonding net work	#2 AWG or larger (1/0 preferred)
Bonding conductor to each PDU or panel board serving the room.	Size per NEC 250.122 & manufacturer recommendations
Bonding conductor to HVAC equipment. equipment	6 AWG
Building columns	4 AWG

Cable ladders rack- trays	6 AWG
Conduit, water pipe, duct	6 AWG

## 2.2 COMPONENTS, KITS AND HARDWARE

- A. STRUCTUREDGROUND<sup>™</sup> Grounding System (STRUCTUREDEARTH<sup>™</sup> Earthing System) kits, components, and hardware shall be used to construct the grounding/earthing system.
- B. Use lugs when connecting conductors to the TMGB and TGB.
- C. Route the TBB to each TGB in as straight a path as possible. The TBB should be installed as a continuous conductor, avoiding splices where possible. Use HTAP kits to provide a tap from the TBB to each TGB. When more than one TBB is used; bond them together using the TGBs on the top floor and every third floor in between with a conductor known as a Grounding Equalizer (GE). Use the J-STD-607-A guidelines for sizing of the TBB when sizing the GE (shown in the table above).
- D. Avoid routing grounding/earthing conductors in metal conduits. If the grounding/earthing conductor must be routed through a metal conduit, bond each end of the conduit to the grounding/earthing conductor. Use grounding clamps to bond to the conduit and a #6 AWG copper conductor to connect the GPL grounding clamp to the HTWC HTAP.

# 2.3 RACK GROUNDING/ EARTHING

- A. Equipment, equipment racks and ladder rack shall be bonded in accordance with the methods prescribed in ANSI/TIA-942-A.
- B. To provide electrical continuity between rack elements, paint piercing grounding washers, shall be used where rack sections bolt together, on both sides, under the head of the bolt and between the nut and rack.
- C. When the equipment manufacturer provides a location for mounting a grounding connection, that connection shall be utilized. Use the appropriate jumper for the equipment being installed and the thread-forming screws provided in the kit.
- D. Do not bond racks or cabinets serially. Use the copper compression HTAP that comes with the kit to bond the conductor to the common bonding network. Grounding lugs shall be double holed.

### PART 3 - PART 3 - EXECUTION

### 3.1 GROUNDING SYSTEM

- A. The communications grounding system shall be designed and/or approved by a qualified PE licensed in the state that the work is to be performed. The communications grounding system shall adhere to the recommendations of the ANSI/TIA-942-A and J-STD-607-C standards, and shall be installed in accordance with best industry practice.
- B. A General Contractor shall perform installation and termination of the main bonding conductor to the building service entrance ground.
- C. A General Contractor shall perform installation and termination of the main Telecommunications Grounding Bus Barr.

END OF SECTION 270526

# SECTION 270528 – PATHWAYS FOR COMMUNICATIONS SYSTEMS

### Part 1. GENERAL

- A. This Section includes the following:
  - 1. Conduit, fittings and bodies, including multi-cell conduit.
  - 2. Riser flexible raceway (inner duct) and fittings.
  - 3. Junction boxes pull boxes and gutters.
  - 4. Measured pull tape.
  - 5. J-Hooks.
  - 6. Wire Tray / Ladder Rack.

## 1.2 REFERENCES

- A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.
- B. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of contract unless the document is shown dated.
- C. Conflicts:
  - 1. Between referenced requirements: Comply with the one establishing the more stringent requirements.
  - 2. Between referenced requirements and contract documents: Comply with the one establishing the more stringent requirements.
- D. References:
  - 1. American National Standards Institute (ANSI):
    - a. C80.1 Rigid Steel Conduit Zinc Coated.
    - b. C80.4 Fittings for Rigid Metal Conduit.
  - 2. Federal Specifications (FS):
    - a. W-C-58C Conduit Outlet Boxes, Bodies Aluminum and Malleable Iron.
    - b. W-C-1094 Conduit and Conduit Fittings Plastic, Rigid.
    - c. WW-C-566C Flexible Metal Conduit.
    - d. WW-C-581D Coatings on Steel Conduit
    - e. National Electrical Manufacturers Association (NEMA):
    - f. RN1 Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Electrical metallic Tubing.
    - g. TC2 Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
    - h. TC3 PVC Fittings for Use with Rigid PVC Conduit and Tubing.
    - i. NEMA VE 1 Metal Cable Tray Systems.
    - j. NEMA VE 2 Metal Cable Tray Installation Guidelines.
  - 3. American Society for Testing and Materials International (ASTM)
    - a. ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    - b. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.

- c. ASTM B633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- 4. Underwriters Laboratories Inc. (UL):
  - a. 514 B Fittings for Conduit and Outlet Boxes.
  - b. 651 Schedule 40 and 80 Rigid PVC Conduit.
  - c. 651A Type EB and A Rigid PVC Conduit and HDPE Conduit.
  - d. 1666 Standard for Riser Application for Optical Fiber Raceway.
- 5. National Fire Protection Association (NFPA) ANSI/NFPA 70 National Electrical Code (NEC).
- 6. ANSI/TIA-569-D-1, Telecommunications Pathways and Spaces
- 7. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual (TDMM).
- 8. Local, county, state and federal regulations and codes in effect as of date of purchase.
- 9. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be
- 10. Indicate in the proposal the components that may be of foreign manufacture, if any, and the country of origin.

### 1.3 SUBMITTALS

- A. The Cable Contractor shall perform no portion of the work requiring submittal and review of record drawings, shop drawings, product data, or samples until the respective submittal has been approved by the Owner. Such work shall be in accordance with approved submittals.
- B. Qualifications: The Cable Contractor shall submit qualification data sheets for firms and persons as specified in the "Quality Assurance" article of this specification to demonstrate their capabilities and experience.
- C. Proposed product data sheets: The Cable Contractor shall submit catalog cut-sheets that include manufacturer, trade name, and complete model number for each product specified. Model number shall be handwritten and/or highlighted to indicate exact selection. Identify applicable specification section reference for each product.
- D. Coordination Drawings: The Cable Contractor shall submit coordination drawings showing coordination between communications pathways and other trades.
- E. Record Drawings: Furnish CAD drawings of completed work including cable ID numbers following the Owner's labeling standards. Submit in hardcopy (two full size and two half size) and electronic formats.

### 1.4 QUALITY ASSURANCE

- A. Cable Contractor Qualifications:
  - 1. The Cable Contractor shall submit references and other related evidence of installation experience for a period of three years prior to the issue date of this Specification.
  - All work shall be supervised on-site by a BICSI Registered Communications Distribution Designer (RCDD). Must demonstrate knowledge and compliance with all BICSI, TIA, UL, and NEC standards and codes. Cable Contractor shall submit proof of RCDD designation.
- B. Provided products shall meet the following requirements: Items of the same classification shall be identical. This requirement includes equipment, assemblies, parts, and components.

C. Assure that the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.

### 1.5 WARRANTY

A. General Warranty: Refer to General and Special Provisions Document for warranty requirements.

#### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

## 1.7 DELIVERY AND STORAGE

- A. Equipment shall be delivered in original packages with labels intact and identification clearly marked.
- B. Equipment shall not be damaged in any way and shall comply with manufacturer's operating specifications.
- C. Equipment and components shall be protected from the weather, humidity, temperature variations, dirt, dust, or other contaminants. Equipment damaged prior to system acceptance shall be replaced at no cost to the Owner.

### 1.8 COORDINATION

- A. Field coordinate installation of conduit and cable tray with other trades to ensure clearance requirements are met.
- B. Coordinate with all contractors providing equipment outside the scope of this contract.

### PART 2 - PRODUCTS

- 2.1 PATHWAYS
  - A. Definition:
    - 1. For the purpose of this document, the term "Telecommunication Pathways" defines a portion of the communication infrastructure. Telecommunication Pathways include products provided for the routing, segregation and support of telecommunication cabling both inside and outside of facilities.

- B. Primary Industry Standard Requirements for Telecommunication Pathways:
  - 1. Comply with ANSI/TIA-569-D-1

## 2.2 J-HOOKS

- A. J-Hooks shall be the secondary pathway for cable distribution from TRs to work outlets:
  - 1. Comply with ANSI/TIA-569-D-1.
  - 2. J-Hooks shall be sized to accommodate known cable load and provide for 100% expansion.
  - 3. J-Hooks shall be attached directly to the building structure and shall not be supported by any other building systems such as electrical conduits, HVAC duct work, and plumbing or sprinkler pipe.
  - 4. Comply with the requirements of all related NEMA, ASTM and BICSI standards.

# 2.3 CONDUIT SYSTEMS

- A. Conduit pathways shall be provided by the electrical contractor as complete Conduit systems including:
  - 1. Conduit with pull strings.
  - 2. Pull box / Junction box assemblies (provided after 180 degrees of bends and/or 100' on continuous run).
  - 3. Mounting / attachment hardware.
  - 4. Labeling.
  - 5. Grounding.
- B. Conduit Fill Calculations.
  - 1. Calculate and provide conduit systems with sizing and quantities to assure conduit wire/cable fill does not exceed pulling tensions, rush limits and performance properties of cables installed.
- C. Conduit Trade Sizes
  - 1. Typical conduit trade sizes used in Inside Plant Telecommunication Pathways are:
    - a. Trade Size 3/4Inch EMT.
    - b. Trade Size 1 Inch EMT (Minimum Conduit size without written exception by OAT Engineer).
    - c. Trade Size 1 Inch EMT.
    - d. Trade Size 2 Inch EMT.
    - e. Trade Size 3 Inch EMT.
    - f. Trade Size 4 Inch EMT.
    - g. Various trade size "Flex" conduit (typically limited to 6 feet in length).

## 2.4 FIRESTOPPING

- A. Fire stopping shall be provided for Telecommunication Pathways at penetration areas for fire rated walls and floors. Fire stopping shall meet or exceed the hour rating of wall or floor penetrated by the Telecommunication Pathway.
  - 1. Fire stopping shall comply with latest release of NEC NFPA 70.
  - 2. Fire stopping products and applications shall provide containment of smoke, fumes and flame with performance in accordance with ASTM E814-00 and UL 1479.
  - 3. Local Authority Having Jurisdiction -Building Code Requirements.
- B. Types of Fire stopping hardware and materials include:
  - 1. Mechanical Fire stopping Products Conduit Sleeves
    - a. Conduit Sleeves.
    - b. Cable Tray Penetrations.
    - c. Penetration Frame Products.
  - 2. Non-Mechanical Fire stopping Products:
    - a. Putties.
    - b. Caulks.
    - c. Cementitious / Foams / Intumescent Materials.
    - d. Prefabricated Pillows, Blocks and Blankets.
  - 3. Fire stopping products shall be installed per manufacturer's practices.
  - 4. Manufactures include:
    - a. Specified Technologies Inc. (STI) SpecSeal
    - b. 3M Products.
    - c. CSD Sealing Systems.
    - d. Approved Equal.

## 2.5 GROUNDING

- A. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems." for grounding conductors and connectors.
- B. Telecommunications Main Bus Bar:
  - 1. Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
  - 2. Ground Bus Bar: Each communication room depicted in the drawings shall be provisioned with a Telecommunications Grounding Busbar (TGB) meeting or exceeding the following requirements:
    - a. Each bar shall be installed with isolated standoff mounts.
    - b. Minimal bar size is %" thick x 2" wide x 10" long.
    - c. The TGB's shall be electroplated and pre-drilled for connector attachment to 6 AWG ground cables.
    - d. Holes spaced 1-1/8 inches apart.
- C. A #6 AWG stranded copper wire cable shall be extended between Telecommunication Room (TR) Busbars (TGB) and the Telecommunications Main Grounding Busbar (TMGB) (located in MDF) via conduit and cable tray systems as shown on the drawings.
- D. Ground conductor shall be provided, installed and utilized for equipment, termination, cable tray, equipment rack and computer equipment grounding, including telephone systems.

- E. All grounding material and work shall comply with the National Electric Code (NEC Chapter 8), Local and State regulations as well as ANSI-J/STD-607-C.
- F. Coordinate with the electrical power trades for grounding wiring interface to an approved connection to the building electrical power service panel ground source. Provide #6 AWG stranded copper bonding conductor extending from the electrical ground source to the Telecommunication Main Grounding Busbar (TMGB) located in the MDF.
- G. Provide ground cable #6 AWG stranded copper bonding conductor installed from the TMGB to each of the TR's as depicted in the project drawings ground wiring riser diagram. No Daisy-chaining allowed.
- H. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Cooper B-Line P/N: SB-477or equal.

# 2.6 IDENTIFICATION PRODUCTS

- A. Comply with ANSI/TIA-606-C and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Division 26 Section "Identification for Electrical Systems."

# 2.7 MANUFACTURERS

- A. A. Subject to compliance with requirements, manufacturers that may be incorporated in the work, include, but are not limited to the following:
  - 1. PVC Rigid Conduit:
    - a. Carlon.
    - b. Robroy Industries, Inc.
    - c. Cantex.
    - d. Or equal.
  - 2. Conduit Fittings and Bodies:
    - a. Crouse-Hinds, Appleton Electric.
    - b. Killark Electric Manufacturing Company.
    - c. O-Z/Gedney.
    - d. Or equal
  - 3. J-HOOKS:
    - a. Erico/Caddy.
    - b. Or equal.
  - 4. Measured pull tape pull tape printed with sequential footage markings for accurate measurements:
    - a. Fibertek.
    - b. Condux International.
    - c. Or equal.

# 2.8 MATERIALS

A. Conduits

- 1. All conduits, fittings, junction and pull boxes shall be UL rated.
- 2. All conduits, fittings, junction and pull boxes shall comply with the NEC.
- B. Non-metallic conduits are not permitted in above ground installations. Conversion fittings are required for non-metallic (below ground) to metallic (above ground) transitions. Exceptions will be granted to accommodate the transition from outside plant to inside plant to comply with code requirements
- C. Measured Pull Tape
  - 1. Pre-lubricated, woven polyester, low friction, and high abrasion resistant yarn
  - 2. Minimum average tensile strength shall be 1250 lbs. for 1%-inch and smaller conduits and inner duct.
  - 3. Minimum average tensile strength shall be 1800 lbs. for conduits larger than 1% inch.
- D. Pull Boxes, Junction Boxes and Gutters
  - 1. All junction boxes, gutters and pull boxes shall comply with NEC Article 314.
  - 2. All junction boxes, gutters and pull boxes shall meet the following minimum material requirements:
    - a. 16-gauge steel or heavier.
    - b. Seams shall be continuously welded and grounded smooth.
    - c. External screws and clamps.
    - d. External mounting feet (where possible).
    - e. Oil-resistant gasket and adhesive.
    - f. ANSI 61 gray polyester powder coating inside and out over phosphatized surface.
    - g. UL 50 type 12.
  - 3. All junction boxes, gutters and pull boxes shall be provided with bushings for conduits and/or cabling.
  - 4. All junction boxes, gutters and pull boxes shall be securely installed.
  - 5. All junction boxes, gutters and pull box sizes for single and multiple conduit runs shall comply with BICSI TDMM.

## E. CABLE BASKET, CABLE TRAY and LADDER RACK

- 1. Rated for use with Category 6a cable
- 2. Sized for support of quantity of cable installed at each location
- 3. Metallic and/or plenum rated.
- F. J-HOOKS
  - 1. Rated for use with Category 6a cable
  - 2. Installed as shown in drawings
  - 3. Metallic and/or plenum rated.

## PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Cable Contractor's on-site RCDD supervisor shall review, approve and stamp all shop drawings, coordination drawings and record drawings.
- B. Verify conduit system is properly sized for cables (minimum one inch, unless otherwise noted in Drawings).
- C. Verify general conduit route following Drawings.
- D. Verify substrates to which work is connected and determine detail requirements for proper support.
- E. Verify proper location and type of rough-in for conduit terminations.

# 3.2 INSTALLATION

- A. Coordinate locations with other trades prior to installation.
- B. Install work following drawings, manufacturer's instructions and approved submittal data.
- C. Installation plans and requests for information (RFIs) shall be reviewed by Cable Contractor's onsite RCDD.
- D. All work shall be supervised and reviewed by Cable Contractor's on-site RCDD.
- E. Locations and Types:
  - 1. J-HOOKS
    - Install J-Hooks directly to building structure. Hooks may not be supported by any other building system - e.g. HVAC ducts, electrical conduits, plumbing or ceiling supports.
    - b. J-Hooks shall be installed every 48".
    - c. J-Hooks must be install straight level & plumb.
    - d. Cables shall be neatly bundled and secured to hooks using Velcro or Velcro type straps or fasteners.
    - e. Cable Contractor's RCDD supervisor shall coordinate with drawings of other disciplines to determine availability of space for installation.
  - 2. CABLE TRAY/ LADDER RACK
    - a. Install cable tray in telecomm closets as depicted on drawings
    - b. Position, elevation and routing of cable tray shall be coordinated with GC to ensure there is no conflict with equip-net furnished and installed by any other contractor on site (e.g. HVAC, Electrical, Plumbing etc.)
    - c. Cable tray shall be secured directly to building structure and not supported by any other equipment or service element (e.g. ceiling grid, black iron, HVAC supports etc.)
    - d. Ladder within the telecommunications rooms (MDF, IDF) may be supported to the above the equipment racks within these rooms.
    - e. Support system shall be straight, level and plumb and show no signs of sagging or drooping at any point.

- f. Cables in these trays shall be neatly bundled and secured using Velcro straps ONLY
- g. All tray and ladder rack shall be grounded according to NEMA, BICSI and local jurisdiction requirements
- h. Cable Contractor's RCDD supervisor shall coordinate with drawings of other disciplines to determine availability of space for installation.
- 3. CABLE BASKET
  - a. Install cable basket in hallway ceilings as depicted on attached drawings telecomm closets as depicted on drawings
  - b. Position, elevation and routing of cable basket shall be coordinated with GC to ensure there is no conflict with equipment furnished and installed by any other contractor on site (e.g. HVAC, Electrical, Plumbing etc.)
  - c. Cable basket shall be secured directly to building structure and not supported by any other equipment or service element (e.g. ceiling grid, black iron, HVAC supports etc.)
  - d. Support system shall be straight, level and plumb and show no signs of sagging or drooping at any point.
  - e. Cables in these baskets shall be neatly bundled and secured using Velcro straps ONLY
  - f. All Cable basket shall be grounded according to NEMA, BICSI and local jurisdiction requirements
  - g. Cable Contractor's RCDD supervisor shall coordinate with drawings of other disciplines to determine availability of space for installation.
- F. Design Considerations:
  - 1. Conduit fill shall comply with ANSI/TIA -569-D.
  - 2. The minimum bend radius is six times the conduit inside diameter (ID) for a two inch conduit or less.
  - 3. The minimum bend radius is 10 times the conduit ID for a conduit greater than two inches.
  - 4. Below grade conduit shall extend three inches above finished floor (AFF) with a bushing.
  - 5. Ceiling conduit or sleeves shall extend six inches below finished ceiling with a bushing.
  - 6. All stubbed conduit ends shall be provided with a ground bushing.
  - 7. All conduit penetrations shall comply with all applicable fire codes. All conduit penetrations in fire-rated walls or floors shall be sealed and fire proofed to at least the rating of the penetration area.
  - 8. Conduits shall be routed in the most direct route, with the fewest number of bends possible.
  - 9. There shall be no continuous conduit sections longer than 100 feet. For runs that total more than 100 feet, insert junction or pull boxes (or gutters if appropriate) so that no continuous run between pull boxes is greater than 100 feet.
  - 10. There shall be no more than two 90-degree bends (180 degrees total) between conduit pull boxes.
  - 11. Changes in direction shall be accomplished with sweeping bends observing minimum bend radius requirements above. Do not use pull boxes for direction changes unless specifically designated otherwise in the Drawings.
  - 12. Unless otherwise noted in the Drawings, conduits entering pull boxes shall be aligned with exiting conduits.
- G. Identification: Refer to Section 270553 Identification for Communications Systems for labeling requirements.

# 3.3 CLEANING

A. Remove all unnecessary tools and equipment, unused materials, packing materials and debris from each area where Work has been completed unless designated for storage.

#### 3.4 ACCEPTANCE

- A. Once all work has been completed, test documentation has been submitted and approved, and the Owner is satisfied that all work has been completed in accordance with contract documents; the Owner will notify Cable Contractor in writing of formal acceptance of the system.
- B. Acceptance shall be subject to completion of all work and submittal and approval of full documentation as described above.

END OF SECTION 270528

## SECTION 270553 - IDENTIFICATION FOR COMMUNICATIONS SYSTEMS

### PART 1 - GENERAL

- A. This Section includes labeling and identification standards for:
  - 1. Horizontal and backbone cabling and termination hardware
  - 2. Conduits and pathways
  - 3. Equipment cabinets, racks, frames and enclosures
- B. As-builts shall contain matching label information

# 1.2 REFERENCES

- A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.
- B. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of contract unless the document is shown dated.
- C. Conflicts:
  - 1. Between referenced requirements: Comply with the one establishing the more stringent requirements.
  - 2. Between referenced requirements and contract documents: Comply with the one establishing the more stringent requirements.
- D. References:
  - 1. ANSI/TIA -606-C Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
  - 2. International Standards Organization/International Electromechanical Commission (ISO/IEC) DIS11801, January 6, 1994
  - 3. Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM)
  - 4. Local, county, state and federal regulations and codes in effect as of date of purchase.
  - 5. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be indicated in the proposal the components that may be of foreign manufacture, if any, and the country of origin

## 1.3 SUBMITTALS

- A. Product Data:
  - 1. The Contractor shall submit catalog cut-sheets that include manufacturer, trade name, and complete model number for each product specified.
  - 2. Model number shall be handwritten and/or highlighted to indicate exact selection. Identify applicable specification section reference for each product.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

#### 1.4 QUALITY ASSURANCE

- A. Provided products shall meet the following requirements: Items of the same classification shall be identical. This requirement includes equipment, assemblies, parts, and components.
- B. Assure that the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.

# PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers that may be incorporated in the work, include, but are not limited to the following:
- B. Labels and Labeling System
  - 1. Basis of Design: Brady
  - 2. Acceptable substitutes: Dymo, Belden or submitted and Approved equal

#### 2.2 GENERAL REQUIREMENTS

- A. All telecommunication components, areas, and cables shall be labeled, including but not limited to:
  - 1. Fiber cables.
  - 2. Metallic cable.
  - 3. Ground points.
  - 4. Cross-connect fields.
  - 5. Exterior enclosures.
  - 6. Conduit ends (pathways).
  - 7. Pull boxes and junction boxes.
  - 8. Equipment racks and cabinets.
  - 9. Fiber patch panels
  - 10. Maintenance holes.
  - 11. Cables in maintenance holes and pull boxes.
  - 12. Patch cables/jumpers.
- B. Pathways are defined but not limited to; any conduit, innerduct, underground duct bank, wiring troughs, pull boxes, and any wiring systems used to enclose cabling of any type.
- C. All label material shall be suitable for intended usage and environment, meeting the legibility, defacement and general exposure requirements listed in UL 969 for indoor and outdoor use. Where insert labels are used, the insert label shall be covered with clear cover and securely held in place.
- D. Interior labeling: printer shall be of the thermal transfer type capable of printing self-laminating labels of various size up to and including 1.5" by 1.5" printable area with a 4.5" self-laminating tail. No non-self-laminating labels shall be approved.
- E. All labels shall be permanent, i.e. will not fade, peel, or deteriorate due to environment or time.

F. Handwritten labels are not acceptable.

## 2.3 CONDUITS AND PATHWAYS

- A. Conduits: General-purpose label designed for powdered coated surfaces with an ultra-aggressive adhesive, trade name, "Mondo Bondo" (Brady). Label size shall be appropriate for the conduit size. Font size shall be easily visible from the finished floor.
- B. Innerduct: Polyethylene general-purpose tagging material
  - 1. Brady part number PTL-12- 109 (.75 X 3.00) used with an R4310 ribbon. This tag shall be attached using tie wraps.
- C. Junction boxes (larger than four-inch x four-inch): General-purpose label designed for powdered coated surfaces with an ultra-aggressive adhesive, trade name, "Mondo Bondo", Brady part number PTL-43-483 (1.90 X continuous) used with an R6010 ribbon. Font size shall be easily visible from the finished floor.
- D. Junction boxes (four-inch x four-inch): General-purpose label designed for powdered coated surfaces with an ultra-aggressive adhesive, trade name, "Mondo Bondo"
  - 1. Brady part number PTL-42-483 (1.00 X continuous) used with an R6010 ribbon.

### 2.4 BACKBONE AND HORIZONTAL CABLE AND TERMINATIONS

- A. Fiber termination hardware (cover): General purpose label designed for powdered coated surfaces, trade name, "Mondo Bondo"
  - 1. Brady part number PTL-42-483 (1.00 X continuous) used with an R6010 ribbon.
- B. Fiber termination hardware (designation strip): Thermal transfer printable label with a permanent acrylic adhesive
  - 1. Brady part number PTL-10-423 (.75 X .25) used with an R6010 ribbon.
- C. Patch panels: Gloss white film with a permanent acrylic based adhesive
  - 1. Brady part number PTL-39-422 (.375 X .60) used with an R6010 ribbon.
- D. Inside and outside plant fiber cables: Permanent acrylic adhesive, self-laminating vinyl wire and cable identification
  - 1. Brady part number PTL-33-427 (1.50 X 4.00 X 1.00) used with an R4310 ribbon.

## 2.5 EQUIPMENT RACKS AND CABINETS

- A. General purpose label designed for powdered coated surfaces.
- B. Basis of Design: Trade name, "Mondo Bondo",
  - 1. Brady part number PTL-42-483 (1.00 X continuous) used with an R6010 ribbon.

# PART 3 - EXECUTION

- 3.1 GENERAL
  - A. Labeling format shall be as shown in Telecommunications Drawings Set.

## 3.2 CONDUITS AND JUNCTION/PULL BOXES

- A. All conduits, innerduct, junction boxes, gutters and pull boxes shall be labeled.
- B. Conduits shall be labeled with the word "communications" and the conduit's origination room number and destination room number. Permanent room identifiers shall be used.
- C. Label conduit every 50 feet, at each wall and floor penetration and at each conduit termination, such as outlet boxes, pull boxes, and junction boxes, or as otherwise specified in other Sections.
- D. Junction boxes, gutters and pull boxes shall be labeled with identification name or number as determined by Contractor and submitted for approval.
- E. Labels on conduits, junction boxes, gutters and pull boxes shall be machine-generated and easily visible from the finished floor.

### 3.3 FIBER TERMINATIONS

- A. Label cable terminations on designation strips.
- B. Label all cable at each terminating point.
- C. Labels shall be self-adhesive and machine generated.
- D. Handwritten labels are not acceptable
- E. Cable identification numbers shall not be duplicated.
- F. Three copies of a cable record document containing the cable information required on the cable label shall be delivered to the GOAA Telecommunications Department.

### 3.4 EQUIPMENT RACKS AND CABINETS

- A. All racks and cabinets shall be properly labeled with permanent typewritten labels, easily visible from finished floor.
- B. Label as indicated in Drawings.

## 3.5 CLEANING

A. Remove all unnecessary tools and equipment, unused materials, packing materials, and debris from each area where Work has been completed unless designated for storage.

# 3.6 ACCEPTANCE

- A. Once all work has been completed and the Owner is satisfied that all work has been completed in accordance with contract documents, the Owner will notify Contractor in writing of formal acceptance of the system.
- B. Acceptance shall be subject to completion of all work and submittal and approval of full documentation as described above.

END OF SECTION 270553

## SECTION 270813 – TESTING COPPER CABLES

## PART 1 - GENERAL

- A. The work covered by this section of the Specifications includes all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work of this section shall include, but is not limited to, the following:
  - 1. Cable testing for copper cables.
  - 2. Providing testing results in accordance with the strictest manufacturer written recommendations.

### 1.2 QUALITY ASSURANCE

- A. Refer to Section 27 00 00 for general details.
- 1.3 CODES, STANDARDS AND GUIDELINES
  - A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations in Section 27 00 00.

## 1.4 SUBMITTALS

- A. Refer to Section 27 00 00 for general details.
- B. Submit Manufacturer's Cut Sheets for the following:
  - 1. Any products not specifically listed in the PRODUCTS section shall require a submittal of the manufacturer's cut sheets.
- C. List of test equipment to be used.
- D. Sample of test data to be provided to the campus representative at the completion of testing.
- E. Identity and qualifications of Contractor's personnel who will perform the testing.
- F. Submit the proposed schedule for performing testing at least 2 weeks prior to the start of testing.

### 1.5 IDENTIFICATION

- A. Refer to Section 27 05 53 for general details.
- 1.6 WARRANTY
  - A. Refer to Section 27 00 00 for general details.

### PART 2 - PRODUCTS

### 2.1 CATEGORY 6 UTP CABLE TESTER

- A. Testing for all cables 25 pair or larger are to use a tester that tests 25 pair at a time.
- B. The field tester must meet the requirements of ANSI/TIA/EIA-568.
- C. Make and model at Contractor's discretion.

### 2.2 MULTIMETER

A. Make and model at Contractor's discretion.

### PART 3 - EXECUTION

- 3.1 GENERAL
  - A. The Contractor shall test, as described below, all metallic cables installed under these specifications.
  - B. Visually inspect all cables, cable reels, and shipping cartons to detect cable damage incurred during shipping and transport. Return visibly damaged items to the manufacturer.
  - C. Where post-manufacturer test data has been provided by the manufacturer on the reel or shipping carton: submit copies to the campus representative prior to installing cables.
  - D. Test fully completed systems only. Piecemeal testing is not acceptable.
  - E. Testing shall not be performed until after all hardware is installed and attached, and all labeling and identification has been completed.
  - F. Any cable that does not pass all required testing shall be removed, replaced, and retested.
  - G. Remove and replace any defective cables from pathways system. Do not abandon cables in place.
  - H. The telecommunications representative reserves the right to observe all portions of the testing process.
  - I. The telecommunications representative further reserves the right to conduct "Proof of performance testing", using Contractor equipment and labor, a random re-test of up to ten percent (10%) of the cable plant to confirm documented test results.
  - J. Perform all tests as required by the manufacturer in support of the structured cabling system warranty.
- 3.2 GROUNDING & BONDING
  - A. All grounding and bonding is to be complete before any system testing is to be attempted.

- 3.3 TESTING
  - A. All test results are to be defined as acceptable / unacceptable by the requirements of ANSI/TIA/EIA-568 B.2.
  - B. Copper Cables General Requirements
    - 1. After terminating and splicing the cables. Test all cable pairs for:
      - a. Continuity to the remote end.
      - b. Shorts between any 2 or more conductors or ground
      - c. Transposed pairs
      - d. Reversed Pairs
      - e. Split Pairs
      - f. Crossed Pairs
      - g. Wire map.
      - h. Length.
      - i. Shield Continuity (If Shielded)
      - j. Continuity to Grounding (If Shielded)
    - 2. Using a multimeter, test continuity to ground (TGB or TMGB) for a maximum resistance of  $1\Omega$ , see section 27-05-26 for additional detail.
  - C. Indoor Riser or OSP Copper Cable
    - 1. After terminating and splicing the cables. Test all cable pairs for:
      - a. DC Loop Resistance for any 2 conductors in the cable
  - D. Category 6A Copper Station Cables:
    - 1. Contractor is to perform a three connector permanent link test.
    - 2. After terminating both ends of all 4-pair cables, but before any cross-connects are installed, test these cables for the following:
      - a. Return Loss
      - b. Insertion Loss
      - c. Attenuation
      - d. NEXT (near-end crosstalk)
      - e. PSNEXT (power sum near-end crosstalk)
      - f. FEXT (far end crosstalk)
      - g. ACR-F (attenuation to crosstalk ratio)
      - h. PSACR-F (power sum attenuation to crosstalk ratio)
      - i. Propagation delay
      - j. Delay skew

# 3.4 ACCEPTANCE

- A. All test results for Cat 3 cable are to be documented and submitted in Microsoft Excel or .csv format to the campus telecommunications representative within five (5) working days of test completion.
- B. All test results for Cat 6A cable are to be documented and submitted in Fluke LinkWare format to the campus telecommunications representative within five (5) working days of test completion.
- C. Test result shall be recorded per cable and identical copies placed on three removable media devices (CD or DVD) for delivery to the campus project manager and campus telecommunications representative.
- D. Each test report shall contain the following general information:
  - 1. Date of Preparation
  - 2. Date of Test
  - 3. Project Name
  - 4. Contractor's Name
  - 5. Media Type
  - 6. Make, Model and Serial Number of test equipment used
  - 7. Date of Last Calibration
  - 8. Names of Test Crew.
- E. In addition to the results of the specific tests specified, reports shall also include:
  - 1. Cable Number
  - 2. Cable Type
  - 3. Pair or Conductor Count
  - 4. Individual Pair or Conductor Numbers,
  - 5. Results of Each Test for Each Pair or Conductor
  - 6. Total Number of Serviceable Pairs or Conductors in Cable.
  - 7. Ground Resistance Measurements
- F. Once the testing has been completed and the telecommunications representative is satisfied that all work is in accordance with the Contract Documents, the representative will notify the Contractor and/or project manager in writing or via email.

END OF SECTION 280813

# SECTION 27100 STRUCTURED CABLING

# PART 1 - GENERAL

# 1.1 REFERENCES

- A. All work shall be performed in accordance with the following Codes and industry Standards, unless noted otherwise:
  - 1. NFPA 70 National Electrical Code, current version adopted by local or State AHJ.
  - 2. ANSI/TIA-568.0-D Generic Telecommunications Cabling for Customer Premises
  - 3. ANSI/TIA-569-D-1, Telecommunications Pathways and Spaces.
  - 4. ANSI/TIA-606-C, Administration Standard for Commercial Telecommunications Infrastructure.
  - 5. ANSI/TIA-607-E, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
  - 6. IEEE 241 IEEE Recommended Practice for Electric Power Systems in Commercial Buildings, pertaining to communication systems.

### 1.2 WARRANTY

A. The Cable Contractor must be an approved Certified Installer. The Cable Contractor is responsible for workmanship and installation practices in accordance with the Manufacture Certified Installer or Partner Alliance (PA) program offering a 25 year warranty issued to the end user. The Cable Contractor shall have 30% of their technicians trained on fiber and copper installations and testing; they also shall have at least 1 project manager successfully complete a Manufacture 2-Day Management Certification class. Painting or paint overspray will void the warranty. The Telecommunications Contractor shall ensure that the General Contractor and Painting Contractor acknowledge that painting of or over spray any single or group of 4 pair horizontal telecommunications Category 6A cable is not allowed. Any painted or over sprayed cable(s) shall be replaced at the painting contractor's expense. Painted Cable will not be covered as part of an extended warranty. Painted cable in addition to obscuring the print legend may act as an accelerant or create an additional smoke hazard in the event of a fire and as such this is considered a life safety issue.

#### 1.3 SUMMARY

- A. This Section includes general requirements specifically applicable to Division 27.
  - 1. Work Specifically Excluded from Project:
  - 2. Materials provided by the owner as identified in the Contract Documents.

- B. The Cable Contractor shall be responsible for:
  - 1. Providing all additional materials, and the necessary labor and services required to ensure all components of the system are completely installed in accordance with the intent of the Contract Documents.
  - 2. Furnishing and installing all incidental items not actually shown or specified, but which are required by good practice to provide complete functional systems.
  - 3. Coordinating the details of facility equipment and construction for all specification divisions that affect the work covered under this Division.
  - 4. Coordinating all activities with the overall construction schedule.
  - 5. Developing bill of materials, perform material management and efficient use of the materials whether they are issued by the Cable Contractor, the owner or purchased by the Cable Contractor.
  - 6. Ensure materials in excess of those required to complete the project are kept in their original condition and packaging for restocking.
  - 7. Ensure project is properly registered for a warranty.
  - 8. Furnish and install fire stopping for all fire rated penetrations or as required by AHJ.
  - 9. Ensure entire system is installed in compliance with all applicable Federal, State and local codes and standards. The more stringent codes and standard shall take precedence.
- C. Intent of Drawings:
  - 1. Communications plan drawings show only general locations of equipment, devices, raceways, cable trays, boxes, etc. All dimensioned locations and elevations are approximate. The Cable Contractor is responsible for the field coordination of communications work with the other trades prior to beginning work.
  - 2. The Cable Contractor shall be responsible for the proper placement and routing of equipment, cable, raceways, cable tray, and related components; according to the Contract Documents and subject to prior review by Cable Contractor.
  - 3. Refer all conflicts between Contract Documents to Cable Contractor for resolution.

# 1.4 DEFINITIONS

- A. Active Equipment: Electronic equipment used to develop various WAN and LAN services.
- B. Backbone: Collective term sometimes used to describe the campus and vertical distribution subsystem facilities and media interconnecting service entrances, communications rooms, and communications cabinets.
- C. Bonding: Permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed on it.
- D. Main Distribution Frame (MDF): Room in each building used to distribute communications services to Intermediate Distribution Frame (IDF) in the same building. Typically, the MDF contains passive equipment used for electrical protection (protectors) and building cross connect, and active network equipment used for LANs. The IDF may also serve the function of an IDF.
- E. Cabinet: Freestanding, floor-mounted modular enclosure designed to house and protects rack mounted electronic equipment.

- F. Cable Tray: Vertical or horizontal open supports usually made of aluminum or steel that is fastened to a building ceiling or wall. Cables are laid in and fastened to the trays. A cable tray is not a raceway.
- G. Campus: Grounds and buildings of a multi-building premises environment.
- H. Channel: The end-to-end transmission path between two points at which application specific equipment is connected; may include one or more links, cross-connect jumper and/or patch cords, and work area station cords. Does not include connection to active equipment.
- I. Communications Equipment Room -See IDF Drawings.
- J. Cross-Connect: Equipment used to terminate and tie together communications circuits.
- K. Cross-Connect Jumper: A cluster of twisted-pair conductors without connectors used to establish a circuit by linking two cross-connect termination points.
- L. Fiber Optic Distribution Unit (FDU): Cabinet with terminating equipment used to develop fiber optic cross-connect facilities.
- M. Grounding: A conducting connection to earth, or to some conducting body that serves in place of earth.
- N. Hinged Cover Enclosure: Wall-mounted box with a hinged cover that is used to house and protect electrical devices.
- O. Horizontal: Pathway facilities and media connecting IDF to Telecommunications Outlets (TO).
- P. Jack: Receptacle used in conjunction with a plug to make electrical contact between communications circuits, e.g., eight-position/eight-contact modular jacks.
- Q. Link: A transmission path between two points, not including terminal equipment, work area cables, and equipment cables; one continuous section of conductors or fiber, including the connecting hardware at each end.
- R. Local Area Network (LAN): Data transmission facility connecting a number of communicating devices, e.g., serial data, Ethernet, token ring, etc. Typically, the network is limited to a single site.
- S. Main Equipment Room (MER): The room used to distribute communication services to all MDF's on the premises, and to interconnect premises services with the telephone companies.
- T. Media: Twisted-pair, fiber optic cable or cables used to provide signal transmission paths.
- U. Mounting Frame: Rectangular steel framework which can be floor or wall mounted to support wiring blocks, patch panels, and other communications equipment.
- V. Passive Equipment: Non-electronic hardware and apparatus, e.g., equipment racks, cable trays, electrical protection, wiring blocks, fiber optic termination hardware, etc.
- W. Patch Cords: A length of wire or fiber cable with connectors on one or both ends used to join communications circuits at a cross-connect.

- X. Patch Panel: System of terminal blocks or connectors used with patch cords that facilitate administration of cross-connect fields.
- Y. Pathway: Facility for the placement of communications cable. A pathway facility can be composed of several components including conduit, wireway, cable tray, surface raceway, underfloor systems, raised floor, ceiling support wires, etc.
- Z. Protectors: Electrical protection devices used to limit foreign voltages on metallic communications circuits.
- AA. Raceway: An enclosed channel designed expressly for holding wires or cables; may be of metal or insulating material. The term includes conduit, tubing, wire way, underfloor raceway, and surface raceway; does not include cable tray.
- BB. Racks: An open, freestanding, floor-mounted structure, typically made of aluminum or steel, used to mount equipment; usually referred to as an equipment rack.
- CC. Telecommunication Outlet (TO): Connecting device mounted in a work area used to terminate horizontal cable and interconnect cabling with station equipment.
- DD. IDF: Distributes communications services to users within a serving zone and interconnects with the BER. Typically, the TER contains passive equipment used for cross connect and active network equipment used for LANs. TR is sometimes referred to as the communications equipment room.
- EE. Wide Area Network (WAN): Active communications transmission facilities extending beyond the premises.
- FF. Wiring Block: Punch down terminating equipment used to develop twisted-pair cross connect facilities.

# 1.5 SYSTEM DESCRIPTION

- A. The owner will implement a comprehensive integrated communications distribution system, as described in paragraph B below, to provide wiring infrastructure which may be used to support one or more of the following services and systems:
  - 1. Data telecommunications.
  - 2. Wireless systems.
  - 3. Facilities management systems.
  - 4. Mass Notification.
  - 5. Paging.
  - 6. Life Safety.
- B. The communications distribution system consists of the following major subsystems, as specified elsewhere:
  - 1. Intra-Building Backbone: The inter-building subsystem refers to all twisted pair and fiber optic backbone communications cabling connecting the MDF to IDFs in separate buildings.
  - 2. Communication Rooms: The communications room contains the distribution subsystem comprised of the passive components used to terminate cabling subsystems and distribute communications services. This subsystem includes installations in the MDF, in

IDF and Telecommunications Enclosures (TEs). Constructed as specified in Section 271100.

- 3. Horizontal Distribution: The horizontal distribution subsystem refers to all intra-building twisted-pair and fiber optic communications cabling connecting IDF's to telecommunication outlets (TOs) located at individual work areas. Constructed as specified in Section 271500.
- 4. Work Area Distribution Subsystem: Patch cords, adapters, and devices located between the TO and station equipment. Constructed as specified in Section 271600.
- C. The communications distribution system is based on a combination of the following communications transmission technologies:
  - 1. 100-ohm 4-pair unshielded twisted-pair cable 500MHz (CAT6A).
  - 2. 8-position telecommunications jacks.
  - 3. 8-position telecommunications patch panels (CAT6A).
  - 4. Insulation displacement connector (IDC) type field terminated wiring blocks.
  - 5. Factory Terminated copper patch cords.
- D. The work locations and limits of work are shown on the drawings.

### 1.6 DESIGN CRITERIA

- A. Compliance by the Cable Contractor with the provisions of this specification does not relieve him of the responsibilities of furnishing materials and equipment of proper design, mechanically and electrically suited to meet operating guarantees at the specified service conditions.
- B. The following are incorporated into the design:
  - 1. The location of communication rooms is intended to restrict the maximum horizontal subsystem wiring length (defined as a channel between a telecommunications room cross-connect termination field and a served TO) to 295 feet (90 meters).

# 1.7 WARRANTY

- A. The Cable Contractor shall provide a manufacturer's warranty on the horizontal systems as specified in Section 271500.
- B. In addition to the standard warranty requirements, the Certified Contractor shall provide the following during the warranty period:
  - 1. Within 24 hours after notification of a defect, the Certified Contractor shall start to make the necessary corrections and inform the appropriate Project Manager of the planned corrective actions. The Certified Contractor shall follow this initial contact with continuous effort and complete any required corrective work within 15 days after notification.

# 1.8 QUALIFICATIONS

A. Communications Pathway Installation: The Cable Contractor shall have 5 years of documented experience installing raceway and cable tray systems for each of the types and system material components specified in the Contract Documents, e.g., underground duct banks, cable tray, etc.

In the case of newer technologies that do not have a 3-year history, the Cable Contractor shall have documented experience for at least half of the lifetime of the new technology.

- B. The Cable Contractor selected for this project must be certified by the manufacturer of the products (Panduit/General) adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning this project.
- C. The Cable Contractor must be an approved Certified Installer for the system bid. The Cable Contractor is responsible for workmanship and installation practices in accordance with the Certified Installer. The certified contractor shall have 30% of their technicians trained on copper & fiber installations and testing; they also shall have at least 1 project manager successfully complete a 2-Day Management Certification class.
- D. Company certificate & letter from manufacturer stating certification is in good standing, shall be included with submittal.
- E. Certified Installer must register project with Manufacture and must provide a warranty on the installation workmanship & testing for a length of twenty-five (25) years.
- F. The Cable Contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size. The Cable Contractor shall own and maintain tools and equipment necessary for successful installation and testing of both fiber optic and Category 6A premise distribution systems and have personnel who are adequately trained in the use of such tools and equipment.
- G. A resume of qualification shall be submitted with the Cable Contractor's proposal indicating the following:
  - 1. A list of recently completed projects of similar type and size with contact names and telephone numbers for each.
  - 2. A technical resume of experience for the Cable Contractor's Project Manager and on-site installation supervisor who will be assigned to this project.
  - 3. A list of technical product training attended by the Cable Contractor's personnel that will install the structured cabling system shall be submitted with the response.
  - 4. Any sub-contractors, who will assist the Certified Contractor in performance of this work, shall have the same training and certification as the Certified Contractor.

# 1.9 SUBMITTALS

- A. General:
  - 1. Provide ongoing inspection and permit certificates and certificates of final inspection and acceptance from the authority having jurisdiction.
  - 2. Manufacturer's standardized schematic diagrams and catalog cuts shall not be acceptable unless applicable portions of same are clearly indicated and non-applicable portions clearly deleted or crossed out.
  - 3. When the specifications include product descriptions, model numbers, part numbers, etc. that have been superseded, changed, or discontinued, the Cable Contractor shall submit a comparable substitution for review by the A/E.
- B. Provide all applicable portions of the following information with the Bid:

- 1. Documentation establishing qualifications to perform installation functions as required in 1.9 above:
- 2. Statement demonstrating an understanding of project scope and schedule which includes the following information:
  - a. Where (city, office) the project will be staffed.
  - b. Project organizational chart with team names; e.g., project manager, A/Es, principal skilled technicians, and contractors.
- C. Provide all applicable portions of the following information within 10 days of award of Subcontract:
  - 1. Project schedule in hard copy. Include, at a minimum, major tasks, milestones, dependencies, staffing, and durations for each task.
  - 2. Cable Contractor shall work with other contractors to merge this schedule into the overall construction schedule.
  - 3. Provide the following information for materials, components, and equipment to be furnished by the Cable Contractor:
    - a. Descriptive literature, manufacturer's specification data sheets, and manuals.
    - b. Individual price and delivery schedules.
    - c. Final Performance testing criteria and data for communications distribution system cabling systems.

# 1.10 DEFINITION OF ACCEPTANCE

- A. A. System acceptance shall be defined as that point in time when the following requirements have been fulfilled:
  - 1. All submittals and documentation have been submitted, reviewed, and approved.
  - 2. The complete system has successfully completed all testing requirements.
  - 3. All owner staff personnel training programs have been completed.
  - 4. All punch list items have been corrected and accepted.
  - 5. Project registration for warranty by manufacturer.

# 1.11 PROJECT RECORD DOCUMENTS

- A. A. Provide detailed project record documentation within 30 days after completion of the work.
  - 1. Maintain separate sets of red-lined record drawings for the communications work which show the exact placement and identification of as-built system components.
  - 2. Provide communication pathway record drawings which indicate exact placement and routing for all components, e.g., maintenance holes, hand-holes, conduit, wire-way, cable tray, pull boxes, enclosures, telecommunications outlet boxes, etc.
  - 3. Provide communication room record drawings which indicate exact placement for all components; e.g., conduit, wire-way, cable basket, cable tray, backboards, equipment cabinets, equipment racks, cross-connect equipment, etc.
  - 4. Provide communication wiring and cabling record "As-Built" drawings and schedules which indicate exact placement, routing, and connection details for all components, e.g., twisted-pair and fiber optic cables, splices, cable cross-connect termination locations, enclosures, telecommunications outlets, cross-connect jumpers, patch cords, etc.
  - 5. Provide network schematics when appropriate.

# PART 2 - PRODUCTS

### 2.1 APPROVALS AND SUBSTITUTIONS

- A. The approved telecommunications hardware manufacturers:1. Match Existing- (Panduit)
- B. If an equal product is to be bid, Cable Contractor must get prior approval from project engineer or client in order to be considered for substitution.

### PART 3 - EXECUTION

#### 3.1 WORKMANSHIP

- A. Manufactured products, materials, equipment, and components shall be provided, conditioned, applied, installed, connected, and tested in accordance with the manufacturer's specifications and printed instructions.
- B. The installation of all system components shall be carried out under the direction of qualified personnel. Appearance shall be considered as important as mechanical and electrical efficiency. Workmanship shall meet or exceed industry standards.

### 3.2 SERVICE CONTINUITY

- A. Manufactured products, materials, equipment, and components shall be provided, conditioned, applied, installed, connected, and tested in accordance with the manufacturer's specifications and printed instructions.
- B. The installation of all system components shall be carried out under the direction of qualified personnel. Appearance shall be considered as important as mechanical and electrical efficiency. Workmanship shall meet or exceed industry standards.

# 3.3 LAYOUT AND TOLERANCES

- A. Follow as closely as practicable the design shown on the drawings. Make all necessary measurements in the field to verify exact locations and ensure precise location and fit of specified items in accordance with the drawings. Make no substantial alterations without prior approval of Cable Contractor and the A/E.
- B. Perform all work to the lines, grades, and elevations indicated on the drawings. Provide experienced, competent personnel to locate and lay out the work and provide them with suitable tools, equipment, and other materials required to complete layout and measurement work. Use lasers or other approved methods to establish line and grade.

# 3.4 CONSTRUCTION REVIEW

A. The A/E and Cable Contractor will review and observe installation work to ensure compliance by the Cable Contractor with requirements of the Contract Documents.

- B. The Cable Contractor shall inspect and test completed communications installations to demonstrate specified performance levels including the following:
  - 1. Furnish all instruments and personnel required for the inspections and tests.
  - 2. Perform tests in the presence of the A/E and Cable Contractor.
  - 3. Demonstrate that the system components operate in accordance with the Contract Documents.
  - 4. All existing data cabling that is to be abandoned must be removed in its entirety and discarded.
  - 5. All unused Data cabling cabinets are to be removed and discarded.
  - 6. All existing data boxes (TO) and wiremold raceways are to be removed and discarded.
  - 7. All electronic equipment in the Data cabinets is to be returned to the district for reuse.
- C. Review, observation, assistance, and actions by the Architect/Engineer (A/E) or General Contractor (GC) shall not be construed as undertaking supervisory control of the work or of methods and means employed by the Cable Contractor. The A/E's and GC's review and observation activities shall not relieve the Cable Contractor from the responsibilities of these Contract Documents.
- D. The fact that the A/E, GC or the owner does not make early discovery of faulty or omitted work shall not bar the A/E, GC or the owner from subsequently rejecting this work and insisting that the Cable Contractor make the necessary corrections.
- E. Regardless of when discovery and rejection are made, and regardless of when the Cable Contractor is ordered to correct such work, the Cable Contractor shall have no claim against the A/E, GC or the owner for an increase in the Subcontract price, or for any payment on account of increased cost, damage, or loss.

END OF SECTION 271000

# SECTION 271100 – COMMUNICATIONS EQUIPMENT ROOM AND FITTINGS

# PART 1 – GENERAL

### 1.1 WORK INCLUDED

- A. Provide all labor, materials, tools, and equipment required for the complete installation of work called for in the Contract Documents.
- B. Telecommunications Rooms (MDF/IDF) are generally considered to be floor serving facilities. Horizontal Cross-connects link the Horizontal cable and the Backbone Cable together. The Horizontal Cross-connects shall consist of rack or wall mounted wiring blocks or panels for termination of copper cables or rack or wall mount interconnect termination units or fiber management panels/trays for the termination of optical fibers. Cross-connect spaces include the labeling of hardware for providing circuit identification and patch cords or cross-connect wire used for creating circuit connections at the cross-connect.

### 1.3 SCOPE

- A. This section includes the minimum requirements for equipment, termination hardware and cable installations in communication equipment rooms.
- B. The telecommunications room shall be equipped to contain telecommunications equipment, cable terminations, and associated cross-connects.
- C. Minimum composition requirements and installation methods for the following:
  - 1. Cable Management Hardware
  - 2. Patch Panels Category 6

#### 1.4 QUALITY ASSURANCE

- A. All equipment rooms shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the Contract.
- B. Documents shall be subject to the control and approval of the Owners representative.
- C. Equipment and materials shall be of the quality and Manufacturer indicated.
- D. The equipment specified is based on the acceptable manufacturers listed.
- E. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified, and subject to approval.

COMMUNICATIONS EQUIPMENT ROOM

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- F. Separation from sources of EMI shall be as specified in section.
- G. Communication grounding/earthing and bonding shall be in accordance with applicable codes and regulations. It is recommended that the requirements of ANSI/TIA-607-E, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises throughout the entire cabling system.
- H. Materials and work specified herein shall comply with the applicable requirements of:
  - 1. ANSI/TIA-568.0-D Generic Telecommunications Cabling for Customer Premises.
  - 2. ANSI/TIA-568.1-D Commercial Building Telecommunications Cabling Standard.
  - 3. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standard.
  - 4. ANSI/TIA-568.3-D Optical Fiber Cabling and Components Standard.
  - 5. ANSI/TIA-569-D-1, Telecommunications Pathways and Spaces.
  - 6. Underwriters Laboratory.
  - 7. Federal Communications Commission (including CFR 47 and Part 68 subpart F).
  - 8. National Electric Code.
  - 9. Local and State Codes.
  - 10. ISO/IEC 11801.
  - 11. IEC 1000-5-2.
  - 12. CSA C22.2.
  - 13. IEC 60603-7.
- I. Manufacturers shall be ISO 9001 Certified, for all components that are required to have submittals provided as part of this section.

# PART 2 – PRODUCTS

- 2.1 Category 6 UTP CABLE
  - A. Be UL VERIFIED for TIA Category 6 electrical performance.
  - B. Shall be UL Verified for Category 6 compliance and be CSA C22.2 approved.
  - C. Workstation cabling shall be blue in color.
- 2.2 CATEGORY 6 PATCH PANELS (IF REQUIRED)
- A. Be made of a steel frame with black power coat finish 24port configurations.
- B. Have mounting slots compatible with ANSI/EIA-310.
- C. Allows the modular insert to accept 110-style patch plugs as a means of termination.
- D. Shall be T-568B Wired.

# COMMUNICATIONS EQUIPMENT ROOM

- E. Provide 24 port panels, unless otherwise noted.
- F. Density must accommodate at least 24 port per single rack unit (1.75" or 44.5mm)
- G. Paired punch down sequence to allow pair twist within  $\frac{1}{2}$ " of the termination.
- H. Shall have port identification numbers on front and rear of the panel.
- I. Have 110 style insulation displacement contacts and termination accomplished with a single conductor impact tool or 4 or 5 pair impact tool. Optionally allow IDC style contact termination with Belden REVConnect products and tool.
- J. Be backwards compatible to allow lower performing categories of cables or connecting hardware to operate to their full capacity.
- K. Have circuit identification and color-coding designation strips provided with the panel.
- L. Provide port configurations and densities as called for on drawings.
- M. Provide rear cable management bar(s) as recommended by the Manufacturer.
- N. Shall be Insulation Displacement Connector 110 style terminations.
- O. Provide TIA 606-C compliant color-coded icons or color-coded designation label strips for all patch panels. Identify voice or data functionality as required.
- P. Paired punch down sequence to allow pair twist within  $\frac{1}{2}$  of the termination.
- Q. Provide rear stress relief components as recommended by the manufacturer.
- R. Contractor shall first utilize all open patch panel ports. Provide a new Cat 6 24 port patch if required.
- S. Acceptable Manufacturers:
  - 1. Match existing-Panduit
- 2.3 CATEGORY 6 PATCH CORDS MATCH COLOR OF CABLES
  - A. Shall be round, and consist of eight insulated 24 AWG, stranded copper conductors, arranged in four color- coded twisted-pairs within a flame-retardant jacket.
  - B. Be equipped with modular 8-position plugs on both ends, wired straight through with standards compliant wiring.
  - C. Use modular plugs, which exceed FCC CFR 47 part 68 subpart F and IEC 60603-7 specifications, and have 50 microinches minimum of gold plating over nickel contacts.
  - D. Be resistant to corrosion from humidity, extreme temperatures, and airborne contaminants.

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- E. Utilize cable that exhibits power sum NEXT performance.
- F. Be available in several colors with or without color strain relief boots providing snagless design.
- G. Meet the flex test requirements of 1000 cycles with boots and 100 cycles without boots.
- H. Be available in any custom length and standard lengths of meters (3, 5, 7, 10, 15, 20, and 25 feet).
  - 1. Contractor to provide (2) patch cords per new terminated patch panel port.
  - 2. Device end shall be 7' in length and the patch panel end shall be 12" in length.
- I. Be made by an ISO 9001 Certified Manufacturer.
- J. Electrical Specifications:
  - 1. Input impedance without averaging  $100 \square \pm 15\%$  from 1 to 250 MHz.
  - 2. 100% transmission tested for performance up to 250MHz Manufacturer shall guarantee cords are compatible with Category 6 links.
  - 3. Utilize cable that is UL VERIFIED (or equivalent) for TIA proposed Category 6 electrical performance.
  - 4. UL LISTED 1863.

#### 2.7 EQUIPMENT RACKS

- A. Contractor to utilized existing wall mount rack.
- B. All equipment racks shall be grounded.

# PART 3 - EXECUTION

### 3.1 CABLE MANAGEMENT

- A. Provide reusable Velcro-type hook and loop straps in each rear vertical channel. Reusable straps shall be of varying sizes (each allowing 50% spare future expansion) and of adequate quantity to secure cable bundles at least every 4 rack units.
- B. Secure cable managers, slack managers, support bars, hook and loop straps per manufacturer recommendations.
- 3.2 CATEGORY 6 PATCH PANELS
  - A. Install and label as recommended by manufacturer, per all TIA 606-C.

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- B. Install rear cable management bar(s) as recommended by manufacturer.
- C. Install TIA 606-C compliant color-coded icons or color-coded designation label strips for all patch panels. Identify Data functionality.
- 3.3 CABLE SUPPORTS
  - A. Keep horizontal wall mounted cable runs to a minimum. In general horizontal runs shall be on wall mounted ladder rack.
  - B. Provide cable brackets 3' on center supported to building structure for all cable runs not supported by cable tray.
- 3.4 MISCELLANEOUS REQUIREMENTS
  - A. All cables shall be neatly "dressed out" in equipment rooms.
  - B. Provide service loops on all cables terminated in the telecommunications rooms, per the drawings.
  - C. Firestop all sleeves and conduits openings after the cable installation is complete.

END OF SECTION 271100

COMMUNICATIONS EQUIPMENT ROOM

# SECTION 271500 – COMMUNICATIONS HORIZONTAL CABLING

# PART 1 - GENERAL

A. Horizontal (distribution) communications wiring and connecting hardware from the Telecommunications Room (IDF) to Telecommunication Outlets (TO) throughout the site.

# 1.2 REFERENCES

- A. All work shall be performed in accordance with the following codes and industry standards, unless noted otherwise:
  - 1. NFPA 70 National Electrical Code, current version adopted by local or State AHJ.
  - 2. ANSI/TIA-568.0-D Generic Telecommunications Cabling for Customer Premises
  - 3. ANSI/TIA-568.1-D Commercial Building Telecommunications Cabling Standard
  - 4. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards
  - 5. ANSI/TIA-569-D-1, Telecommunications Pathways and Spaces.
  - 6. ANSI/TIA-526-14-C, Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant
  - 7. ANSI/TIA-606-C, Administration Standard for Commercial Telecommunications Infrastructure.
  - 8. ANSI/TIA-607-E, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
  - 9. ANSI/TIA-1152–2009, Requirements for Field Test Instruments and Measurements for Balanced Twisted-Pair Cabling
  - 10. ANSI/TIA TSB-162-A Telecommunications Cabling Guidelines for Wireless Access Points
  - 11. IEEE 241 IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to communication systems

# 1.3 SYSTEM DESCRIPTION

- A. The horizontal distribution subsystem refers to all intra-building twisted-pair and fiber optic (if required) communications cabling connecting Main Distribution Frames (MDF) and/or Intermediate Distribution Frames (IDF's) to telecommunication outlets (TO's) located at individual work areas.
- B. Horizontal cabling may consist of a combination of the following types of cable from the MDF/IDF to the TO:
  - 1. Data Cables: Category 6, (250MHz, 4-pair, ANEXT, unshielded twisted pair), for cables from the MDF/IDF's to the TO's.
- C. The Horizontal System includes cables, jacks, connectors, patch panels, connecting blocks, patch cords, fiber connectors and jumpers as well as the necessary support systems, such as cable managers and faceplates.
- D. Cables may be routed through conduit, cable trays, spaces below raised floors, open ceiling areas, non-ventilated spaces above ceiling tile, and through plenum air-handling spaces above ceiling tile.
- E. Cable Contractor shall furnish and install all materials necessary for a complete and working system.
- F. All cables shall be plenum rated.

# 1.4 WARRANTY

- A. The Cable Contractor must be an approved manufacturer's Certified Contractor. The Cable Contractor is responsible for workmanship and industry standard installation practices. The certified contractor shall have 30% of their technicians trained on copper & fiber installations and testing by the manufacture; they also shall have at least 1 project manager.
- B. Cable Contractor shall provide labor, materials and documentation according to manufactures requirements necessary to ensure that the Owner will be furnished with a Warranty of 25 years in length.
- C. The copper warranty guarantees installed static channel (Includes patch cords) performance above the TIA Standards for CAT 6A cabling systems. The static channel performance tests shall be performed in the field with an approved Cable certification tester in the channel test configuration.
- D. Horizontal channel solution is to conform to all requirements of Category 6 performance.
- E. All necessary documentation for warranty registration must be provided to manufacturers will be furnished by the Cable Contractor immediately following 100% testing of all cables. All test results shall be submitted to manufactures in the certification tester's original software on CD.
- F. Cable Contractor shall administer the warranty process with the responsible manufacturer's representative. The warranty shall be provided directly to the owner from the manufacturer. Cable Contractor shall insure that the manufacturer provides the Owner with the appropriate warranty certification within 30 calendar days of the final project completion.

### PART 2 - PRODUCTS

- 2.1 APPROVALS AND SUBSTITUTIONS
  - A. All products shall be provided as specified without exception, unless approved in writing prior to the bid.
  - B. Non-compliant products installed as a part of this Contract shall be removed and replaced and all costs for removal and replacement shall be borne solely by the Cable Contractor(s).
  - C. All products shall be "NEW".

# 2.2 STATION CABLING

- A. 250 MHZ, Category 6, 4-pair unshielded twisted pair, CMP rated
  - 1. Manufacturer
    - a. General Cable
  - 2. Data cable jacket color shall be blue for station cables.
  - 3. Contractor to field coordinate exact cable color with architect and GC prior to installation.

# 2.3 MODULAR JACKS

- A. Category 6 modular jacks modular jacks
  - 1. 8-position modular jack, Category 6, IDC terminals, T568B wiring scheme
  - 2. Each jack must be stamped or have icons to identify it as CAT 6.
  - 3. Color to be coordinated with building finishes and Architect.
  - 4. Manufacturers:

a. Panduit

# 2.4 WORK AREA OUTLETS

- A. Flush mounted faceplates
  - 1. Single gang face plates constructed from fire retardant plastic with label fields, mounts within a double gang wall box with reducer plate.
    - a. Panduit
      - 1) Single gang 1 port
      - 2) Single gang 2 port
      - 3) Single gang 4 port
      - 4) Wall Phone Plate
      - 5) All unused plate opening are to be provided with a blanking insert color shall match that of the plate.
        - a) All faceplate colors are to be coordinated with owner and architect to match finish.

# 2.5 PATCH PANELS

- A. Category 6 Patch Panels
  - 1. Cat 6 110-StylePatch Panel, 24-Port, 1RU.

NOTE: Contractor to first utilize existing patch panel open ports. Provide new patch panel if required.

- PART 3 EXECUTION
- 3.1 GENERAL
  - A. Horizontal cabling includes cables, jacks, patch panels, connecting blocks, and patch cords, as well as the necessary support systems, such as cable managers and faceplates.
  - B. Cable Contractor shall furnish and install all materials necessary for a complete and working system.
  - C. Cable Contractor must be a Certified Systems Vendor for the cable system bid and installed up to, during, and through completion of the system installation, and must be able to provide the manufacturer's extended warranty.
  - D. Field terminated copper and fiber optic patch cords and jumpers are not allowed.
  - E. All work shall be performed in a professional manner.
  - F. Install cable after interior of building has been physically protected from the weather and all mechanical work likely to damage cabling has been completed.
  - G. Before installing cabling, ensure all cable pathways are completely and thoroughly cleaned:
  - H. Inspect conduit, wire-way, cable trays and innerduct installed by others.
  - I. Clean any additional enclosed raceway and innerduct systems furnished.
  - J. Provide protection for exposed cables where subject to damage.

- K. Provide abrasion protection for any cable or wire bundles, which pass through holes or across edges of sheet metal. Protective bushings shall be used to protect cables.
- L. Velcro type Cable ties and other cable management clamps shall be no more than hand tightened and shall fit snugly, but not compress, crimp, or otherwise change the physical characteristics of the cable jacket or distort the placement of twisted-pair components. Replace any cable exhibiting stresses due to over tightening of cable management devices. Plenum spaces require Plenum rated cable ties. Plastic cable ties are not allowed.
- M. Where possible, route cables in overhead cable trays and inside wire management systems attached to the equipment cabinets and racks. Do Not Use plastic ties or ducts to restrain cabling installed outside of wire management systems on racks or in cabinets. Cable trays shall not exceed 50% fill.
- N. A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit.
- O. Cable raceways shall not be filled greater than the ANSI/TIA-569-D-1, Telecommunications Pathways and Spaces-A maximum fill for the particular raceway type.
- P. A cable basket system shall be used to support cable bundles through-out the building. All cable basket shall be supported at a maximum of 48 to 60 inch (1.2 to 1.5 meter) intervals. At no point shall cable basket rest on acoustic ceiling grids, plumbing pipes, and electrical conduits.
- Q. Horizontal distribution cables shall be bundled in groups of no more than the amount of cables designed for by the cable basket manufacturer recommends based on cable OD and weight. The cable basket system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.
- R. Cables shall not be attached to ceiling grid or lighting fixture wires. Where support for horizontal cable is required, the Cable Contractor shall install appropriate carriers to support the cabling.
- S. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the Cable Contractor prior to final acceptance at no cost to the Owner.
- T. Telecom integrator to coordinate final location of all devices with client.
- 3.2 UNSHIELDED TWISTED PAIR CABLE INSTALLATION PRACTICES
  - A. Cable shall be installed in accordance with manufacturer's recommendations and best industry practices.
  - B. Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points.
  - C. Where transition points or consolidation points are allowed, they shall be located in accessible locations and housed in an enclosure intended and suitable for the purpose.
  - D. The cable's minimum bend radius and maximum pulling tension shall not be exceeded Bend radius for as outlined in ANSI/TIA.
  - E. Unshielded twisted pair cable shall be installed so that there are no bends smaller than four times the cable outside diameter at any point in the run and at the termination field.
  - F. Pulling tension on 4-pair UTP cables shall not exceed 25-lbf for a four-pair UTP cable.

- G. Separation from Power Lines: Provide the following minimum separation distances between pathways for copper communications cables and power wiring of 480 volts or less:
  - 1. Open or Nonmetal Communications Pathways:
    - a. 12 inches from electric motors, fluorescent light fixtures, and unshielded power lines carrying up to 3 kVA.
    - b. 36 inches from electrical equipment and unshielded power lines carrying more than 5 kVA.
    - c. 48 inches from large electrical motors or transformers.
  - 2. Grounded Metal Conduit Communications Pathways:
    - a. 2 1/2 inches from electrical equipment and unshielded power lines carrying up to 2 kVA.
    - b. 6 inches from electrical equipment and unshielded power lines carrying from 2 kVA to 5 kVA.
    - c. 12 inches from electrical equipment and unshielded power lines carrying more than 5 kVA.
    - d. 3 inches from power lines enclosed in a grounded metal conduit (or equivalent shielding) carrying from 2 kVA to 5 kVA.
    - e. 6 inches from power lines enclosed in a grounded metal conduit (or equivalent shielding) carrying more than 5 kVA.

# 3.3 UNSHIELDED TWISTED PAIR TERMINATION

- A. Cables shall be coiled to house the cable coil without exceeding the manufacturers bend radius. In hollow wall installations where box-eliminators are used, excess wire can be stored in the wall. No more than 12" of UTP and 36" of fiber slack shall be stored; Excess slack shall be loosely coiled and stored in the ceiling above each drop location when there is not enough space present in the outlet box to store slack cable.
- B. Cables shall be dressed and terminated in accordance with the recommendations made in the latest version of ANSI/TIA -568-D document, manufacturer's recommendations and best industry practices.
- C. All 4 pair cables shall be terminated on the jack and patch panels using T568-B wiring scheme -CONFIRM FINAL TERMINATION CONFIGURATION WITH DESIGN ENGINEER OR CLIENT PRIOR TO BEGINNING TERMINATIONS
- D. Pair untwist at the termination shall not exceed 12 mm (one-half inch).
- E. Bend radius of the horizontal cable shall not be less than 4 times the outside diameter of the UTP cable. 8 times for FTP cables.
- F. The cable jacket shall be maintained to within 25mm (one inch) of the termination point.
- G. Pair untwist at the termination shall not exceed 13 mm (0.5 inch).
- H. Cables shall be neatly bundled and dressed to their respective panels or blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame.
- I. The cable jacket shall be maintained as close as possible to the termination point. Cable shall not have more than 1.0" removed.

# 3.4 TESTING PROCEDURES

- A. All cables and termination hardware shall be 100% tested for defects in installation and to verify cabling system performance under installed conditions according to the latest requirements of ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards. All pairs of each installed cable shall be verified prior to system acceptance. Any defect in the cabling system installation including but not limited to cable, connectors, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed.
- B. All cables shall be tested in accordance with this document, the ANSI/TIA standards, and best industry practice. If any of these are in conflict, the Cable Contractor shall bring any discrepancies to the attention of the project team for clarification and resolution.
- C. Cables, jacks, connecting blocks, and patch panels shall be in there final position with the building energized.
- D. All Unshielded Twisted Pair cables shall be tested as follows:
  - 1. All twisted-pair copper cable links shall be tested for continuity, pair reversals, shorts, opens and performance as indicated below. Additional testing is required to verify Category performance. Horizontal cabling shall be tested using an approved certification tester (Fluke or Equal) for Category 6 performance compliance as specified in ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards
  - 2. Follow the Standards requirements established in ANSI/TIA-568-C.2.
  - 3. Testing shall be accomplished with an approved certification tester (Fluke is preferred)
  - 4. The basic tests required are:
    - a. Wire Map
    - b. Length (feet)
    - c. Insertion Loss (dB) (Formerly Attenuation)
    - d. NEXT (Near end crosstalk) (dB)
    - e. Return Loss (dB)
    - f. ELFEXT (dB)
    - g. Propagation Delay (ns)
    - h. Delay skew (ns)
    - i. PSNEXT (Power sum near-end crosstalk loss) (dB)
    - j. PSELFEXT (Power sum equal level far-end crosstalk loss) (dB)
    - k. Note: CAT 6a cable shall be tested to a CAT 6a auto test to 500 MHz.
  - 5. All test results shall be provided in the approved certification testers original software format on a CD, with the following minimum information per cable:
    - a. Circuit ID
    - b. All information from 3.4D.4 above.
    - c. Test result, "Pass" or "Fail"
    - d. Date and Time of test
    - e. Project Name
    - f. NVP
    - g. Version of software
    - h. Note: No asterisk \* will be accepted by client. These results shall be retested and submitted after a PASS is received.
  - 6. A software copy of the test results, in the original tester software format, shall be provided to the Owner and Belden.
  - 7. Cable Contractor shall provide a fully functional version of the tester software for use by the Owner in reviewing the test results.

8. Any failed test results that cannot be remedied through re-termination (as in the case of reversed or split pairs), must be reported in writing to the Owner immediately, along with a copy of the test results.

# 3.5 LABELING

- 1. All horizontal cables are to be labeled using a machine printed label at each end of the cable at approximately 12 inches of the termination point, and again at approximately 48 inches from the termination point. Handwritten labels shall not be used.
- B. All patch panel ports and TO ports shall be labeled with the cable identifier.
- C. The labels shall denote the TO ID, as well as the unique cable number for that TO, i.e. A-001-A for cable number 1, A-001-B for cable number 2, and so forth. Owner may provide specific labeling requirements coordinate with owner.
- D. Note all labeling information on the as-built drawings.

END OF SECTION 271500

SECTION 271600 – COMMUNICATIONS CONNECTING CORDS, DEVICES AND ADAPTERS

# PART – GENERAL

### 1.1 REFERENCES

- A. All work shall be performed in accordance with the following codes and industry standards, unless noted otherwise:
  - 1. NFPA 70 National Electrical Code, current version adopted by local or State AHJ.
  - 2. ANSI/TIA-568.1-D Commercial Building Telecommunications Cabling Standard
  - 3. ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards
  - 4. ANSI/TIA-568.3-D Optical Fiber Cabling and Components Standard
  - 5. ANSI/TIA-569-D, Telecommunications Pathways and Spaces. Including Addendum 1.
  - 6. ANSI/TIA-606-C, Administration Standard for Commercial Telecommunications Infrastructure.
  - 7. ANSI/TIA-607-E, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises
  - 8. IEEE 241 IEEE Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to communication systems.

### 1.2 WARRANTY

- A. The Cable Contractor must be an approved Manufactures Certified Contractor. The Cable Contractor is responsible for workmanship and installation practices in accordance with the Manufactures Certified Installer Program. The certified contractor shall have 30% of their technicians trained on copper & fiber installations termination and testing of products used in this installation. Manufacturer will extend a 25-year Warranty to the end user.
- B. The copper warranty guarantees installed static channel (includes patch cords) performance above the TIA Standards for Cat 6 cabling systems. The static channel performance tests shall be performed in the field with an approved Manufactures Certification tester in the channel test configuration.
- C. Cable Contractor shall provide labor, materials and documentation according to Manufactures requirements necessary to ensure that the Owner will be furnished with a warranty covering product and applications for a maximum of 25 years in length.
- D. All necessary documentation that must be provided to the manufacturer will be furnished by the Cable Contractor immediately following 100% testing of all cables.
- E. Cable Contractor shall administer the warranty process with the responsible manufacturer's representative. The warranty shall be provided directly to the owner from the manufacturer. Cable Contractor shall insure that the manufacturer provides the Owner with the appropriate warranty certification within 90 calendar days of the final project completion.

PART 2 - PRODUCTS

# 2.1 APPROVALS AND SUBSTITUTIONS

- A. All products shall be provided as specified, without exception, unless approved in writing prior to the bid. All products shall be "NEW".
- B. Non-compliant products installed as a part of this Contract shall be removed and replaced and all costs for removal and replacement shall be borne solely by the Cable Contractor(s).

# 2.2 PATCH CORDS/JUMPERS

- A. Category 6 unshielded twisted pair.
  - a. Plenum rated patch cord for outlets within the ceilings.
- B. Factory terminated double ended, 8-position to 8-position, modular, stranded conductors, Category 6 4 pair.
  - 1. 7' Cat.6 Patch Cord (device end).
  - 2. 12" Cat. 6 Patch Cord (patch panel end).
  - 3. Provide (2) Cat 6 patch cords per new terminated patch panel port.
  - 4. Contractor to field coordinate exact patch cord lengths and colors with Owner and GC prior to purchasing.

# PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Category 6 modular patch cords
- B. Factory terminated double ended, 8-position to 8-position, modular, stranded conductors, Category 6 4 pair.
- C. One 7-foot long Category 6 (1) 7-foot long Category 6 patch cords as noted below be supplied for each work station (faceplate) installed as part of this project. Stations include:
  - 1. Voice and data stations
  - 2. Wireless access points
  - 3. A/V network stations
  - 1. Cable Contractor shall patch all terminated stations from patch panel to network switch in MDF & IDF's.
- D. Cable ties and other cable management clamps shall be no more than hand tightened and shall fit snugly, but not compress, crimp, or otherwise change the physical characteristics of the cable jacket or distort the placement of twisted-pair components. Replace any cable exhibiting stresses due to over tightening of cable management devices.

- E. Where possible, route cables in overhead cable trays and inside wire management systems attached to the equipment cabinets and racks. Use plastic ties or ducts to restrain cabling installed outside of wire management systems on racks or in cabinets.
- F. Cables shall not be attached to ceiling grid or lighting fixture wires. Where support for horizontal cable is required, the Cable Contractor shall install appropriate carriers to support the cabling.
- G. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced by the Cable Contractor prior to final acceptance at no cost to the Owner.

# 3.2 LABELING

- A. All patch cords are to be uniquely labeled at each end at approximately 2 inches from the termination point.
- B. Note all labeling information on the as-built drawings.

END OF SECTION 271600

#### SECTION 27 41 16

# INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT

#### PART 1 - GENERAL

### 1.1 SUMMARY

- A. The work of this Section is governed by the General Conditions, Supplementary Conditions and Sections in Division 1 Project Manual.
- B. Perform work and provide materials and equipment as shown on Drawings and as specified or indicated in this Section of the Specifications. Completely coordinate work of this Section with work of other trades and provide complete and fully functional systems installation.
- C. Give notices, file plans, obtain permits and licenses, pay fees and backcharges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements and with the Contract Documents.
- D. The work under this Section includes providing of all material, labor, equipment and supplies and the performance of all operations to provide a complete working system as required by the Drawings and details and as specified herein. Where the Drawings, Specifications, Codes, Regulations, Laws, or the requirements of the local Authority conflict, provide the higher quality and higher quantity indicated or required and follow the most strict requirement. In general, the work includes, but is not limited to, the following:
  - 1. Equipment Racks and Cabinets.
  - 2. Terminations.
  - 3. Audio/Visual Cabling:
  - 4. Telecommunications Cabling
  - 5. Audio/Visual Electronic System Components
  - 6. Pathways and Supports
  - 7. Protection of new and existing work.
  - 8. Record Drawings and Documentation.
  - 9. Testing and certification.
  - 10. Coordination with manufacturers, other trades, General Contractor and Owner. Include costs associated with adjustments and changes resulting from coordination.
  - 11. Costs associated with core drilling and cutting and patching using appropriate and trained tradesmen approved by the General Contractor and the Architect.

## 1.2 REFERENCES

- A. All work, equipment, and systems shall be manufactured, provided, repaired, installed, and tested in accordance with the latest edition and all current amendments of the applicable publications and standards of the organizations listed below as of the date of the Contract Documents.
  - 1. Massachusetts Building Code
  - 2. National Fire Protection Association, 1994 (NFPA 70)
  - 3. National Fire Protection Association Life Safety Code, 1994 (NFPA 101)
  - 4. Building Officials & Code Administrators International, Inc. (BOCA) National Building Code
  - 5. Americans with Disabilities Act (ADA)
  - 6. Underwriters Laboratories (UL) Applicable Standards for Safety
  - 7. Underwriters Laboratories (UL) Applicable Standards for Proprietary Security Systems
  - 8. Uniform Building Code, 1994 (UBC)
  - 9. Open network video interface forum (ONVIF) standards and compliance
  - 10. International Building Code (IBC), 2015
  - 11. ANSI/INFOCOMM V202.01:2016 Display image Size for 2D Content in Audiovisual Systems
  - 12. ANSI/INFOCOMM F501.01:2015 Cable Labeling for Audiovisual Systems
  - 13. ANSI/INFOCOMM A102.01:2017 Audio Coverage Uniformity in Listener Areas
  - 14. ANSI/INFOCOMM 2M-2010, Standard Guide for Audiovisual Systems Design and Coordination Processes
  - 15. ANSI/INFOCOMM 3M-2011, Projected Image System Contrast Ratio
  - 16. ANSI/INFOCOMM 4:2012 Audiovisual Systems Energy Management
  - 17. ANSI/INFOCOMM:2013, AV Systems Performance Verification

# 1.3 QUALITY ASSURANCE

- A. Qualifications: Use adequate numbers of skilled, experienced workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
  - 1. The Installer (Firm and Employees) shall be experienced in the operations they are engaged to perform. Demonstrate at least five years of continuous recent experience on similar projects. The Installer shall hold recent, up-to-date licenses, certifications and training certificates in the area the project is located and for the equipment to be installed.
  - 2. Provide names of contacts from the last five similar projects including the General Contractor, Owner's Representative, Architect and Engineer. Indicate project locations, scope and current phone numbers that the contacts can be reached at.
  - 3. Qualified integration Installation firms shall have demonstrable design and installation training with certifications of competence
  - 4. Provide a full time on site foreman who personally has been certified as described above. Submit all documentation under this Section.
  - 5. The contractor must maintain at a minimum of one Infocomm CTS-I, and one CTS for the project.
  - 6. Provide a Project Manager to supervise the project.
  - 7. Each Foreman and Installer working on this project shall be trained to the qualified level as specified by the manufacturer(s) for installation and maintenance of equipment and of the structured cable system being provided on this project, such that the product manufacturer's extended warranty will be in full force.
    - a. The training shall consist of a minimum of proper installation techniques of their specific equipment in order to have a complete operating system meeting or exceeding the requirements as specified herein.
    - b. Each Foreman and Installer working on this project shall have documentation from the manufacturer indicating that he or she has been adequately trained prior to the start of the project. Only Foremen and Installers who have been properly certified and documented by the manufacturer whose equipment is being provided on <u>this</u> project shall be allowed to install the same.
  - 8. Maintain at the site an updated copy of the Manufacturer Trained Installers list including a copy of their training documentation from the manufacturer. This documentation shall be made available to the Architect upon request.
- B. Substitutions: Comply with pertinent Sections of Division 1 and Section 20 05 00 Basic Mechanical and Electrical Requirements.
- C. NRTL Compliance. Comply with requirements of UL-50. The communication system supplies shall be listed by Underwriters' Laboratory under UL® Standard 1459. A copy of the proposed card for the proposed system shall be included with the Contractor's submittal.

## 1.4 SYSTEMS DESCRIPTION

- A. Audio/Visual System Description:
  - 1. Provide:
    - a. A complete audio and visual system for each Room and Common Area as described on the drawings
  - 2. The intent of this project is to provide complete A/V connectivity and equipment for each area. The drawings indicate specific manufacturers for equipment. Contractors cannot substitute manufacturers unless acceptable by the owner. Provide equipment matrix of all components with the bid response.
  - 3. Coordinate what has been provided and what else may be required in order to provide complete installed operating audio visual systems. Provide components, supports and pathways NOT being provided under other Sections, but required for a complete system.
- B. Room Equipment:
  - 1. Multipurpose Room 202:
    - a. The Room shall be a multipurpose room
    - b. The room shall be controlled by a 10" touch panel at the front of the room
    - c. There shall be a single gang digital media faceplate at the front of the room.
    - d. There shall be a Da-Lite Advantage 159" diagonal 16:9 electric screen with low voltage control at the front of the room.
    - e. There shall be a Epson Powerlite L210W projector with ceiling mount and standard throw lens for the room.
    - f. There shall be (9) nine Crestron IC6T-W-T ceiling speakers for the room. There will be a Shure wireless microphone system for the room with remote antenna mounted on the wall at the rear of the room. There shall be (1) Lapel microphone with body pack, (1) handheld microphone with body pack and (1) charging station for both body packs and microphones.
    - g. There shall be a Bluetooth interface at the front of the room.
    - h. There shall be a PTZ camera at the rear of the room
  - 2. Headend Room in Storage room 206 closet:
    - a. Room 103C shall have the Audio-Visual headend cabinet
    - b. There shall be a 12RU wall mount rack in the closet
    - c. The cabinet shall house the AV digital presentation switcher, network switches, wireless microphone receiver, and Bluetooth receiver
    - d. The cabinet shall also have a Crestron TSW1060-NC with rack mount kit for local programming.
  - 3. Multipurpose Room 112, Multipurpose Room 113, Multipurpose Room 114, Computer Room 115, Multipurpose room 116, Multipurpose Room 117, Flexible Room 111, Flexible Room 110, Office 201, Conference room 203:

- a. The Rooms shall be all the same equipment
- b. The rooms shall be controlled by a 8 button single gang Extron MLC62-RS-D controller at the front of each room
- c. There shall be a single gang HDMI and USB pass through faceplate at the front of the room.
- d. There shall e a 4K flat panel display in each room
- e. There shall be a Chief PAC BOX behing the displays in each room
- f. There shall be a Jabra Panacast 50 integrated soundbar, microphone and camera below the display in each room with wall adapter.
- g. There shall be a Crestron Air Media wireless receiver in each room
- h. Provide (10) ten wireless casting dongles, Anycast or approved equal.
- 4. The intent of this project is to provide complete A/V connectivity and equipment for each area. The drawings indicate specific manufacturers for equipment. Contractors cannot substitute manufacturers unless acceptable by the owner. Provide equipment matrix of all components with the bid response.
- 5. Coordinate what has been provided and what else may be required in order to provide complete installed operating audio visual systems. Provide components, supports and pathways NOT being provided under other Sections, but required for a complete system.

# 1.5 SUBMITTALS

- A. Comply with the pertinent provision of Sections in Division 1 and Section 20 05 00 Basic Mechanical and Electrical Requirements.
- B. Qualifications: Submit qualifications as specified in this Section under Quality Assurance.
- C. Organization of Shop Drawings: Submit shop drawings and product data submittals in bound packages organized and titled to match the Articles of Part 2 as specified in this Section.
- D. Indicate clearly all equipment, components or assemblies that are not NRTL listed or labeled. Failure to indicate otherwise implies NRTL listing or labeling. Products found not to be NRTL listed or labeled where such listing or labeling is available shall be replaced.
- E. Include in Submittals:
  - 1. Application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements.
  - 2. Instructions for storage, handling, protection, examination, preparation, operation and installation of product.
  - 3. Detailed shop drawings that show system flow diagrams for each space, detailed installation diagrams, and detailed system risers when applicable.
- F. Maintain at the job site the latest equipment submittals showing the action taken by the Architect. Make these submittals available to Architect.

- G. Product Data: Submit catalog data sheets or other published materials showing appearances, electrical ratings characteristics and connection requirements, seismic ratings, performance characteristics, dimensions, weights, installation methods, and space requirements of equipment and their accessories, as listed below and as required elsewhere in the Specifications and as requested by the Architect. Highlight the specific part numbers as intend to use:
  - 1. Identification Methods
  - 2. Cable pathways
  - 3. Wire and Cable
  - 4. Wiring Devices
  - 5. Grounding and Bonding
  - 6. Seismic Supports and Supplementary Steel
  - 7. Seals and Fittings
  - 8. All equipment and devices as noted under "Work Included"
  - 9. Test Report Formats
  - 10. Test Equipment
  - 11. Test Procedures
- H. Shop Drawings: Submit shop drawings indicating physical size and arrangement, (plans and elevations) construction details, provisions for conduits, access requirements for installation and maintenance, Seismic, finishes, and materials used in fabrication. Supplement shop drawings with wiring diagrams and information as described under Product Data. Provide Shop Drawings for the following and as required elsewhere in the Specifications and as requested by the Architect:
  - 1. Audio Systems
  - 2. Visual Systems
  - 3. Submit complete shop drawings showing inventory of equipment to be installed, parts, and quantity for each communications equipment room and wiring room. Include configuration of complete installed system.
  - 4. Design Data: Submit completed cable schedules for each cable including horizontal and backbone cables, based on construction room numbering.
- I. Samples:
  - 1. Submit three samples of each connector and termination.
  - Submit 5'-0" sample of all cables to be installed on this project including associated published cabling specification and Note Nominal Velocity of Propagation (NOMINAL VELOCITY OF PROPAGATION (NVP)).
- J. Test and Repair Documentation: Provide sample system test records and repair records consisting of the following:
- K. Submit certified test report on each piece of the A/V field testing equipment to be used on this project. Certified test report shall include at least the factory calibration date and test results. Factory calibration and testing shall take place immediately before actual systems testing is to take place. Factory calibration and testing date deemed too far in advance of actual testing may be rejected.
  - 1. As a minimum the submittal shall include the following:
    - a. Description of the configuration and operation of the proposed system.

- b. Outline drawings of all proposed equipment in plan and elevation views including overall dimensions, weights and clearances required.
- c. A complete copy of the specifications with each sub-paragraph on each page noted in the right hand margin with the comment, "compliance", "deviation", or "alternate". In the case of non-primary, vendor-supplied items, the name of the sub-vendor supplying said item, including model number shall be indicated.
  - 1) By noting the term "compliance", it shall be understood that the Manufacturer is in full compliance with the item specified and will provide exactly the same with no deviations.
  - 2) By noting the term "deviation", it shall be understood that the Manufacturer prefers to provide a different component in lieu of that specified. Manufacturer shall indicate all deviations and indicate what is being proposed.
  - 3) By noting the term "alternate", it shall be understood that the Manufacturer proposes to provide the same operating function but prefers to do it in a different manner. An alternate shall be fully described as to what the manufacturer proposes to provide.
- L. Record Drawings: Submit record drawings in accordance with the pertinent provisions of Division 1 for Project Record Documents and Section 20 0500 - Basic Mechanical and Electrical Requirements.
- M. Operation and Maintenance Manuals: Submit copies of the Operation and Maintenance Manuals in compliance with the requirements of Division 1 as specified for Contract Close-Out requirements, Section 20 0500 Basic Mechanical and Electrical Requirements, and the additional requirements of this Section.
- N. Submittal Schedule: Prepare and submit shop drawings, O & M manuals and perform training as indicated on the following schedule:

# 1.6 WARRANTY

- A. Manufacturers shall provide replacement warranties for material and equipment furnished under this Section. Such warranties shall be in addition to and not in lieu of all liabilities, which the Manufacturer and the Installer may have by law or by provisions of the Contract Documents.
- B. All materials, equipment and work furnished or installed under this Section shall be warranted against all defects in materials and workmanship for a period of one year, or for the manufacturer(s)' extended warranty period, whichever is longer, commencing with the date of Substantial Completion. Any failure due to defective material, equipment, installation or workmanship which may develop shall be corrected at no expense to the Owner including all materials, labor, travel, expenses, system diagnostics and 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 warranty period, the affected parts shall be replaced. Any equipment requiring excessive service consisting of more than two unscheduled service calls shall be considered defective and shall be replaced.

- D. Where warranties, maintenance contracts, or training are required beyond a period of one year, provide written proof from the manufacturer for the time period indicated and acceptable to the Architect and provide a performance bond payable to the Owner covering the required work for the time period. Written proof and bonds shall be submitted prior to payment for Substantial Completion.
- E. Include copies of all warranties, maintenance contracts, training contracts and performance bonds in the Operation and Maintenance Manuals.
- F. Extended Product Warranty
  - 1. The Extended Product Warranty covers product defects for all passive components (i.e.: cabling and terminating equipment). Passive components are defined as those exhibiting no gain or contributing no energy. The manufacturer(s) for installation and maintenance of equipment of the structured cable system being provided on this project warrants, from the date of Substantial Completion, the following:
    - a. That the passive products that comprise the A/V cabling system solution will be free from manufacturing defects in material or workmanship under normal and proper use;
  - 2. Under the Extended Product Warranty, the product manufacturer(s) will either repair or replace the defective product itself at the manufacturer(s)' cost, or the manufacturer(s) will pay a qualified integration installation firm with certifications from the manufacturer(s) for the cost of labor to repair or replace any such defective product on behalf the manufacturer(s).
- G. Response times to warranty issues shall differ according to the level of the problem.
  - 1. A problem is considered to be corrected when the system and its components operate according to specified requirements.
  - 2. Warranty work must be performed according to the procedures of the Owner, its staff and users and their normal operations.
  - 3. The following levels of response to problems are required:
    - a. Major Failure: 4 hour maximum response time if notified by telephone, 24 hours per day, 365 days per year.
    - b. Minor Failure: 24 hours maximum response time if notified by telephone, 365 days per year.
  - 4. Failures are defined as follows:
    - a. Major Failure: a system failure, which disables the entire system or major part of the system or an individual critical piece of equipment, which prevents the proper operation of more than one system component.
    - b. Minor Failure: a system failure which affects only one non-critical component and does not affect operation of any other components or any failure which is not defined as a major failure.
    - c. Major and minor failures are as defined by the Owner.

- 5. Response time to a call is defined as the time at which a qualified technician arrives at the site and starts repairs or diagnostics. If the problem has not been corrected within two hours of the initial response, regional and/or national support personnel shall be contacted for assistance.
- H. Adequate stocks of parts, components, etc. and access to regional and national support personnel shall be available such that all major failures shall be corrected within 8 hours of Owner's initial telephone call and all minor failures within 48 hours. Temporary components may be used to meet this requirement while new components or repairs are completed. Temporary components shall be replaced with new (unused) components or the repaired original component as soon as practical. Remanufactured equipment or components are not considered new and shall not be used.
- I. Provide certified factory trained technical service personnel for service and maintenance of the system.
- J. Provide a copy of this warranty section in the Operations and Maintenance Manuals. Each copy shall be dated, signed and certified by an authorized Representative of the Installer providing work under this Section stating that these requirements are understood and will be complied with without exception.
- K. Provide extended warranty as indicated in this specification.

# 1.7 CERTIFICATES OF APPROVAL

- A. Upon completion of all work, and as a condition to receiving payment at Substantial Completion, furnish to the Architect the following original signed certificates and include copies of these certificates as part of the Operation and Maintenance manuals:
  - 1. Certification from the manufacturers authorized representative stating that authorized factory engineers have inspected and tested the operation of their respective equipment and found same to be installed in accordance with the manufacturer's requirements, all requirements for manufacturer's warranties are complied with, and equipment is in satisfactory operating condition. This certification shall be provided for each piece of major equipment and cabling and for all complete systems. Provide certificate for additional items requested by the Architect.
  - 2. Certificates of inspection, letters or notices from the appropriate governmental authorized inspectional authorities stating that all portions of the work (indicate trade and responsibility) have been inspected and are installed in conformance with the applicable codes, laws, ordinances and referenced standards. If non-conformance notices are received, include the re-inspection certificate, letter of explanation, etc. as required to indicate complete conformance. Provide written evidence of all exceptions or variances given by any Inspector.
  - 3. Certificate from the installing firm responsible for the work (indicate trade and responsibility) signed by an authorized Officer of the firm and the Foreman or Project Manager in charge, indicating trade license numbers and stating that to the best of the signer's knowledge and belief that the project (indicate project name and address) has been installed in compliance with the Contract Drawings, Specifications and Addenda, and all applicable codes, laws, ordinances and referenced standards. Where sub-contractors perform a portion of the work of this section include certificates from them.
- B. Final affidavit for the occupancy permit will not be signed until the above certificates have been submitted and accepted.

#### 1.8 SUBSTANTIAL COMPLETION

- A. When Work under this Section, or a designated portion of Work, is substantially complete, submit written notice through the Construction Manager with a list of items remaining to be completed or corrected.
- B. Should Architect observe and find Work is not substantially complete, promptly notify the Construction Manager, in writing, listing observed deficiencies.
- C. Remedy all deficiencies and submit a second written notice of Substantial Completion.
- D. Substantial Completion shall not be considered unless work remaining is less than one percent of the Contract Value of this Section and all systems are operational and tested to verify compliance with Contract Documents. Only minor items shall remain to be completed.
- E. Record Drawings, Operation and Maintenance Manuals, Acceptance Demonstrations, Owner personnel training, spare parts or extra materials required, test reports, warranties, performance bond for extended warranties and maintenance contract and training, and certifications of installation inspections shall be submitted and accepted prior to Substantial Completion.
- F. When Architect finds Work is substantially complete, a Certificate of Substantial Completion in accordance with provisions of the Contract Documents will be prepared.
- G. Certificate of Substantial Completion will not be issued without receipt of all test reports and certificates of warranty.

### 1.9 FINAL COMPLETION

- A. When Work under this Section is complete, submit through the Construction Manager written certification that:
  - 1. Contract Documents (which include addenda, clarifications, requests for information (RFIs), change orders and instructions from the Architect) 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. Work is complete and ready for Architect's final review.
- B. Should Architect observe and find Work incomplete, the review will be promptly suspended and the Construction Manager notified in writing.
- C. Complete work, remedy deficiencies and send a second certification of Final Completion.
- D. Architect, upon receipt of a second certification of completion, shall make a second review and shall notify the Construction Manager listing observed deficiencies.
- E. When Architect finds Work is complete, he will consider close out submittals.

F. Final payment of up to 10 percent of Contract Value (in addition to any retainage being withheld) will be withheld until all punch list items, close out submittals, certifications, training performance bonds, and Acceptance Demonstrations are provided and accepted.

### 1.10 OPERATING INSTRUCTIONS AND OPERATION AND MAINTENANCE (O&M) MANUALS

- A. Give detailed instructions, prior to the Substantial Completion of the work, to the responsible personnel designated by the Owner in the operation and maintenance of all work installed under this Section. A letter with two 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. Prepare three sets of Operation and Maintenance (O& M) Manuals containing Manufacturer's catalogs, other similar data including the necessary photographic equipment cuts, wiring diagrams and final reviewed Shop Drawings and Product Data covering all equipment and devices furnished or installed under this Section. These manuals shall provide complete instructions for the proper operation and use of the equipment together with instructions for lubrication and periodic maintenance and for trouble shooting. Operating instructions shall be specific for each system and shall include copies of posted specific instructions. This manual shall contain only that information which specifically applies to this project and all unrelated material shall be deleted or clearly crossed out.
- C. As a minimum training sessions shall consist of the following:
  - 1. General project information and review shall be by the General Foreman or Superintendent of the Trade.
  - 2. Specific system training shall be by a Factory Trained Representative.
  - 3. Provide a complete review of the project and systems including, but not limited to, the following:
    - a. Note equipment layouts, locations and control points.
    - b. Review each system.
    - c. Review system design operation and philosophy.
    - d. Review areas served by equipment.
    - e. Identify color codes used.
    - f. Review features and special functions.
    - g. Review maintenance requirements.
    - h. Review operation and maintenance manuals.
    - i. Respond to questions
  - 4. After classroom training, walk the entire project, review each equipment room and typical locations. Explain equipment and proper operation.
- D. During the instruction period, the Operation and Maintenance Manual shall be used and explained.

- E. The Operation and Maintenance Manual material shall be bound in 3-ring binders and indexed. On the edge of the binder, provide a clear see-through plastic holder with a typed card indicating the Project name, the Engineer's name, the Installer's name and the Volume number (e.g., Vol. No. 1 of 2).
- F. Provide name, address and telephone number of the manufacturer's representative and service company for all items supplied so that the source of replacement parts and service can be readily obtained.
- G. Include copies of manufacturer's and Installer's warranties and maintenance contracts and performance bonds properly executed and signed by an authorized representative.
- H. Include copies of all test reports and certifications.
- I. Explaining all components of each system including operational features and troubleshooting.

### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Protection: Use all means necessary to protect materials of this Section before, during, and after installation and to protect installed work and materials of all other trades.
- B. Protect and store equipment and materials as required by the Manufacturer, NFPA 70B and as specified herein or on the Drawings. Coordinate with the General Contractor to ensure that suitable controlled environmental conditions are available on site prior to delivery of materials and equipment.
- C. Be responsible for the care and protection of all work included under this Section until it has been tested and accepted.
- D. Protect all equipment and materials from damage from all causes including theft. All materials and equipment damaged or stolen shall be replaced with equal material or equipment at the option of the Architect and Owner.
- E. Materials and equipment stored for this project shall be protected and maintained according to the manufacturer's recommendations and requirements and according to the applicable requirements of NFPA 70B.

### 1.12 SEISMIC REQUIREMENTS

A. Equipment and work shall meet the restraint requirements for a Seismic Zone - 2 location including installation and connections of material and equipment to the building structure.

### 1.13 STAGING, SCAFFOLDING AND HOISTING EQUIPMENT

- A. Provide, removing when no longer needed, all staging, scaffolding, hoisting equipment and planking required to install the work of this Section of the Specification.
- B. Staging, scaffolding, hoisting equipment and planking shall be of approved design, erected and removed by experienced mechanics and workers and shall have accident prevention devices required by Federal, State and local laws.

### PART 2 - PRODUCTS

### 2.1 GENERAL

- A. The Electrical Code referred to in these specifications is the Massachusetts Electrical Code. All work shall be provided in strict compliance with the Electrical Code and all regulations that may apply.
- B. Where standards exist, for a particular category, products used on this project shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL), and be approved or listed for the intended service and application.
- C. These specifications do not undertake to repeat the requirements of codes, regulations or NRTL listing or labeling instructions. The Specifications or Drawings may require items or work beyond the requirements of applicable codes or regulations. The more strict, higher quality, greater quantity or higher cost shall be provided. It is incumbent on the Installer, material and equipment suppliers to meet these specifications, applicable codes, regulations, and NRTL listing agency restrictions.
- D. Manufacturers:
  - 1. The word "Manufacturer" shall include the Manufacturer, the Manufacturer's Representative, the Distributor, the Fabricator, and the Supplier of the particular classification of equipment, system, product, and material.
  - Each and every Manufacturer shall refer to all Sections of the Specifications (Parts One - General, Two - Products and Three - Execution) and Drawings for requirements.
  - 3. Each Manufacturer shall be thoroughly familiar with all specified products relating to the Work and submit written objection prior to bid if he objects to the proposed use of any product.
  - 4. During construction, each Manufacturer shall visit the site periodically to observe the installation of supplied product. The Manufacturer shall advise the Installer and the General Contractor immediately if supplied product is not being installed as recommended by the Manufacturer.
  - 5. Upon completion of the Work, each Manufacturer shall certify in writing that supplied and furnished product was installed according to the Manufacturer's recommendation and the installation is approved by the Manufacturer. Refer to Certifications.
  - 6. Each Manufacturer, when accepting orders for material and equipment, agrees that submittal schedules and production schedules will be adjusted as required to accommodate material and equipment supplied for this project. Material and equipment will be manufactured and delivered to the site sufficiently ahead of schedule so as not to delay the completion of the Work.
  - 7. The Contract Documents are based on the Manufacturer specified. If more than one Manufacturer is listed, the Contract Documents are based on the first Manufacturer named to establish functions, quality, space, and operating features, and all other Manufacturers are considered a substitution.
- E. Material, equipment, enclosures, and systems shall be designed for use as required to suit the conditions, exterior or interior operation, dust tight, water tight, explosion-proof, or other special types.

F. Equipment shall have as a minimum a factory coat of non-lead Manufacturer's standard finish paint unless otherwise indicated.

## 2.2 EQUIPMENT RACKS

- A. Refer to GENERAL Section for additional Manufacturer's requirements.
- B. All work, equipment, and systems shall be manufactured, provided, repaired, installed, and tested in accordance with the latest edition and all current amendments of the applicable standard listed below as of the date of the Contract Documents.
  - 1. ANSI/TIA/EIA-310: Equipment Racks and Cabinets.
  - 2. Tripplite open wall mount rack SRW-012-USDP or equal
- C. All components shall be provided by the equipment rack Manufacturer.
- D. Equipment Racks/Cabinets
  - 1. Equipment racks shall be 19.25 inches wide, 24.5" deep, 12RU high wall mount rack features shall include the following:
    - a. Universal hole pattern on the front and rear flanges, and threaded mounting holes on both sides of rack assembly for management brackets.
    - b. Racks shall be extruded aluminum (not sheetmetal) with 10-32 threaded rackrail with numbered spaces. Mounting holes that require supplemental threaded clips are specifically prohibited.
    - c. The rack shall support a minimum 2000 lb. Static load capacity
    - d. Mounting brackets specifically designed to support the equipment installed within the rack.
    - e. Horizontal cable support bar on rear of each patch panel/cross connect block panel to support hook and loop (Velcro) strain reliefs. Cables shall not rely on terminations for cable support.
    - f. Hook and loop (Velcro®) cable strain relief system on rear of rack to support horizontal and backbone cables. Tie-wraps are specifically prohibited.
    - g. Hook and loop (Velcro®) horizontal and vertical cable management on front of rack for dressing patch cable. Tie-wraps are specifically prohibited.
    - h. Hook and loop (Velcro®) cable management system independent of other cable management to properly dress the electronic equipment power cords through the rack maintaining as much clearances between the two as possible. Tie-wraps are specifically prohibited.
    - i. Bonding and grounding cables for all equipment not directly bolted to equipment rack.

- j. All hardware, supplementary steel, channel and supports as required properly assembling the rack and supporting it as necessary.
- k. All equipment racks and their hardware shall match in appearance and shall be provided by a single manufacturer.

### 2.3 CABLE SUPPORTS

- A. Refer to GENERAL Section for additional Manufacturer's requirements.
- B. Provide products meeting the requirements of the Drawings and Specifications from one of the following manufacturer's:

D-Rings:	B-Line, Harrison/Dracon, Nelson, Mono-System, Minerallac,.
J-Hooks:	B-Line, Harrison/DraconNelson, Mono-System, Minerallac,.
Hook and Loop Fasteners:	B-line, Minerallac, Siemons
Beam Clamps:	Burndy, Minerallac, Kindorff, Steel City, OZ/Gedney
Split Mesh Strain Reliefs (Kellums):	Hubbell, Woodhead

- C. Hook and loop fasteners shall be designed for their specific application.
- D. Tie-wraps:
  - 1. Plastic cable ties are specifically prohibited in headend rooms or multimedia panels.
  - 2. Cable ties can otherwise be used in support applications. Where used in plenum spaces, the tie-wraps must be plenum rated.
  - 3. The plastic cable ties must be applied in such a manner that they can be adjusted by hand after installation.
- E. Beam clamps shall be steel with threaded bolt type closure. Spring steel or "quick-clip" type clamps are specifically prohibited.

### 2.4 INPUT PLATES:

- A. The video input plates in each room shall be Digital Media HDMI transmitter single gang faceplate- Crestron DM-TX-200-C-2G
- B. Provide category 6 4 pair UTP cable for in wall and plenum ceiling installation
- C. The audio input and output plates in the ball room shall be single gang RCA modules.

#### 2.5 PASS THROUGH INPUT PLATES:

A. The pass through input plates in each room shall be a single gang HDMI and USB faceplate.

# 2.6 BLUE TOOTH AUDIO INTERFACE:

- A. The blue tooth audio interface will provide for the pairing and transmission of audio from Bluetooth enabled phones, tablets and PC's
- B. The blue tooth audio interface transmitter shall be a single gang pairing devices that will transmit mono or stereo audio over a category 6 cable to the receiver in the AV room.
- C. The transmitter shall provide for format A input with a frequency response of 20Hz to 20KHz
- D. The receiver shall be a single gang and receive format A transmission from the transmitter.
- E. The receiver shall provide the power to the transmitter.
- F. Provide extra deep surface mount box in the AV room for the receiver.

Acceptable Manufacturer: Radio Design Labs- D series BT1A Transmitter Radio Design Labs- D Series TPR2A Receiver

#### 2.7 SPEAKERS:

- A. The loudspeaker shall be 60 watts, full range loudspeaker system utilizing one 6.5" woofer and one 1" silk dome tweeter
- B. The loudspeaker shall have a nominal rated impedance of 8 ohms and shall be wired in parallel with a line voltage matching (step-down) transformer with a level selector appropriate for various output taps. The loudspeaker input connections will allow for direct connection to 70 volts, amplifiers.
- C. The loudspeaker shall have a protection circuit to protect the product from occasionally being overdriven. Each loudspeaker shall have a Frequency range of 55 Hz 20 kHz. The speaker sensitivity shall be 91dB at 1 watt for 1 meter. The input connection shall consist of screw down removable locking clip-in connector.
- D. Power settings available shall be: 7.5,15,30, and 60 watts at 70 volts; 15, 30, and 60 watts at 100 volts. The nominal dispersion shall be 120° conical coverage pattern, consistent broadband.
- E. The loudspeaker shall be plenum-rated for use in air handling spaces. The loudspeaker shall meet numerous standards for combination music and evacuation systems around the

world. Exposed cosmetic surfaces of the loudspeaker shall be paintable, and the acoustically transparent grille component shall be formed of powder-coated steel.

- F. The loudspeaker shall be 60 watts, full range loudspeaker system utilizing one 6.5" woofer and one 1" silk dome tweeter
- G. The loudspeaker shall have a nominal rated impedance of 8 ohms and shall be wired in parallel with a line voltage matching (step-down) transformer with a level selector appropriate for various output taps. The loudspeaker input connections will allow for direct connection to 70 volts, amplifiers.
- H. Provide all additional mounting brackets as required for proper installation
- I. Acceptable Manufacturer

- 1. Crestron IC6T-W-T Ceiling speakers
- 2. Or Approved equal

# 2.8 AV MULTI-FUNCTION PRESENTATION PROCESSOR

- A. The Presentation Processor unit shall be a single unit composed of internally integrated components providing multiple functions. Included sub-components:
  - 1. Front Panel Control Interface shall provide basic control of the Presentation Processor.
    - a. Audio Matrix/Mixer
    - b. Audio Amplifier
    - c. Video Matrix
    - d. Single Cable Transmission
    - e. Control Processor

# 2. Built-In Device Configuration Software

- a. Configuration Software
  - 1) Software shall support the following:
    - a) System configuration through web browser, specialized software shall not be required.
    - b) System Configuration shall include:
      - (1) Source setup
      - (2) Display setup
      - (3) User Interface setup
        - (a) Manufacturer shall provide multiple user interface options.
      - (4) Add occupancy sensor option
      - (5) Add network management integration
    - c) Security Requirements:
      - (1) Secure access through full user/group management or Active Directory integration
      - (2) Hardware level security using 802.1X authentication
      - (3) TLS, SSL, SSH, and SFTP network security protocols

- d) Deployment
  - (1) A single configuration file shall be network deployable to multiple rooms.
- B. Video System
  - 1. Video Inputs
    - a. Video inputs include HDMI and HDBaseT type input.
      - 1) HDBaseT type inputs shall be compatible with HDBaseT and manufacturers proprietary format supporting additional control functionality.
        - 2) HDMI inputs are compatible with DVI and Dual-Mode DisplayPort sources
  - 2. 4K Video Switcher
    - a. Built-in video matrix switching allows video sources to be routed simultaneously to output connectors.
    - b. Internal switcher shall support routing of HDMI and other AV sources to HDMI and HDBaseT outputs.
    - c. The HDMI outputs are compatible with DVI and the HDBaseT outputs are compatible with HDBaseT and manufacturer proprietary format supporting additional control functionality.
    - d. 4K/60 Video Scaling Unit shall include an independent, 4K scaler on each HDMI output.
- C. Audio System
  - 1. Audio Inputs Each HDMI and analog audio input includes adjustable input compensation to accommodate a range of signals and maintain consistent volume levels when switching between sources.
  - 2. Audio Amplifier Unit shall include a built-in power amplifier.
    - a. Amplifier shall support three mutually exclusive amplifier modes.
      - 1) 100V mode: mono, 40 Watts RMS per channel.
      - 2) 4 ohm, 8 ohm mode: Stereo, 20 Watts RMS per channel at 4 ohms or 8 ohms.
      - 3) 70V mode: mono, 40 Watts RMS per channel.
  - 3. Audio Matrix Functions:
    - a. Any analog input, digital audio input, or HDBaseT audio input signal shall be routable to:
      - 1) Amplified Speaker Output

- 2) Analog line level outputs
- 3) HDBaseT type output
- 4) HDMI output
- 4. Microphone Preamplifier
  - a. Microphone Inputs Each internal microphone preamplifier input shall be connected to two mutually exclusive input connections:
    - 1) Detachable terminal block Balanced microphone level analog audio with switchable 48 volt DC phantom power.
    - 2) Detachable terminal block Balanced or unbalanced line level analog audio.

#### 5. Audio Mixer

- a. All stereo audio outputs shall be capable of outputting independent microphone and program audio mixes.
  - 1) All stereo sources and microphone sources shall be available simultaneously.
  - 2) All stereo sources and microphone sources shall have controllable levels in mixed output signal.

### 6. Audio DSP

- a. Each analog audio output shall include DSP processing, allowing each output to be configured separately. DSP parameters include:
  - 1) real-time adjustable volume, bass, treble, and mute controls
  - 2) 10-band graphic equalization
  - 3) 4-band parametric equalization
  - 4) Adjustable limiting
  - 5) Up to 85 ms of speaker delay adjustment
- D. Single Cable Transmission System
  - 1. HDBaseT type inputs and outputs allow for connecting to remote sources and display devices, and integrating with larger systems via a single CAT5 type cable.
  - 2. The one-wire interface supports transmission of ultra high-definition video, audio, control, power, and networking signals over CAT type cable at distances up to 330 feet (100 meters).
  - 3. Unit shall be HDBaseT Certified

- a. The processor shall be designed using HDBaseT Alliance specifications, and shall support interoperability with other HDBaseT certified products.
- E. Control Processor
  - 1. Unit shall include a built-in control processor with onboard control ports for control of external devices.
  - 2.
  - 3. The Central Switching And Control Unit shall include an integrated microprocessor based control processor.
  - 4. The built-in control processor shall support customizable control of integrated AV devices, room lighting hardware, window shades, and projection screens.
  - 5. Controller shall include the following onboard control ports:
  - 6. Ethernet
  - 7. Four IR ports
  - 8. Two RS-232 COM ports
  - 9. Four relay ports
  - 10. Four digital input ports
  - 11. RS-422 type network control bus
  - 12. Control Subnet Networkinga. Unit shall include a built-in control subnet network port.
  - 13. The controller shall support a network management system by the same manufacturer, supporting overall remote system controlling, monitoring, and managing through network computers and mobile devices.
  - 14. The controller shall support touch screens, keypads, and wireless remotes and mobile device Apps from the same manufacturer.
- F. Multimedia Presentation Gateway
  - 1. General Functionality
    - a. Gateway shall support presentation of content from network connected devices.
  - 2. Architecture
    - a. Gateway functionality shall be a built-in function.
  - 3. Communication
    - a. Dedicated LAN Connection

- 1) 10/100 Mbps, auto-switching, auto-negotiating, full/half duplex, DHCP, SSL, TLS, SSH, SNMP, IPv4, HTTPS web server
- 4. User Device Support
  - a. Gateway shall support connection of up to 32 user devices for presentation.
  - b. Gateway shall support multiple user device types and Operating Systems:
    - 1) Laptop and desktop computers:
      - a) Windows XP, Windows Vista, Windows 7, Windows 8, Window 10, Mac OS X (versions 10.5 thru 10.11)
    - 2) Mobile Devices:
      - a) Apple iOS, Android
- 5. Audio
  - a. Audio Format: Stereo
- 6. Video
  - a. Video Frame Rate Supported: 15 fps (typical)
  - b. Supported Resolutions

800x600@60Hz, 1024x768@60Hz, 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x1200@60Hz, 1920x1080@60Hz (1080p60), 1920x1200@60Hz

- G. Acceptable Manufacturers
  - 1. Crestron DMPS3-4K-350-C
  - 2. Or approved equal

### 2.9 PROJECTOR

The Projector shall have the following features:

- 1. 4500 ANSI Lumens
- 2. WXGA resolution (16:9 aspect ratio)
- 3. High efficiency Blue Laser Phosphor with 20,000 hours
- 4. 2 HDMI inputs, 1 DVI (digital only, 1-HD15, 3.5mm stereo female for serial communications, 1- HDBaseT, 1- RJ45 (control)
- 5. RS232 in
- 6. Adjustable, motorized horizontal and vertical lens offset, motorized zoom and focus adjustment
- 7. Provide Christie 0.37-0.4:1 (140-153100-xx) short throw lens
- 8. Provide Christie one mount with extender rod.
- B. Acceptable Manufacturers
  - 1. Epson Powerlite L210W

2. Or approved equal

### 2.10 PROJECTION SCREEN

- 1. The Projector Screens shall conform to the following:
  - a. The projector screens shall be an electric ceiling mounted with low voltage control faceplate at 48"
  - b. The projection screens shall be 159" nominal Diagonal with a black drop of 2.00 inches, a viewable height of 78" and a viewable width of 139"
  - c. The projection screens shall be Matte white with a standard bottom border
  - d. The projection screens case shall be white, the case length shall be 158" with flange. Provide SCB-100 in internal junction box with VPI
  - e. The projector shall be controlled by the presentation switcher and touch panel at the front of the room.
  - f. Provide all mounting hardware and supports. Coordinate power and exact location in the meeting room with the architect.

#### Acceptable Manufacturer: Da-Lite Advantage Deluxe

## 2.11 WIRELESS MICROPHONE SYSTEM

- A. The digital wireless system shall operate in the VHF, UHF, ISM (900 MHz), 1.2 GHz, 1.5 GHz, or 1.8 GHz band with the specific range being dependent on the user's locale. The system shall include the option of changing the operating frequency in order to avoid RF interference. Preconfigured group, channel and frequency setups shall be available to ensure that multiple systems in use do not interfere with one another.
- B. Provide a bodypack transmitter for use with the lapel microphones,
- C. All transmitters shall be powered by either a Lithium Ion rechargeable battery or 2 AA batteries and shall have a power on/off switch with LED status indicator. When operated with the rechargeable battery, the system shall display remaining run time in hours and minutes (accurate to within 15 minutes), percentage health, percentage charge, charge cycles, and temperature. Provide charging pack for the body packs transmitters and microphones.
- D. The transmitter front end shall optimize itself for standard inputs without requiring transmitter gain adjustments thus allowing all gain changes to be made at the receiver, which shall provide a 60 dB range of system gain. Overall system signal to noise ratio shall be >120 dB.
- E. Provide a quad-channel rackmount receiver. quad-channel receivers shall include Dante<sup>™</sup> digital audio networking in addition to analog audio outputs. All receivers shall include DC power on the RF inputs for use with directional antennas and antenna distribution components.
- F. The receiver shall include an RF level meter, an audio level meter, and a Networking Interface connector for computer control and monitoring. The system shall detect RF interference and indicate such to the user via the LCD and RF meters. The system shall use technology such as digital predictive diversity to optimize RF stability.

G. The system shall include always-on AES-256 encryption that cannot be disabled. The encryption scheme shall conform to the US Government National Institute of Standards and Technology (NIST) publication FIPS-197. The encryption mechanism shall utilize a randomized key that is not transmitted via RF.

Acceptable Manufacturer: Shure ULXD4Q Digital Wireless System.

- Provide (1) SMB8 handheld microphone
  - (1) MX184 lapel microphone with UXD-1 body pack
  - (1) Shure UA874 remote antenna and cable.
  - (1) Shure SBC 203 charger

# 2.12 TOUCH SCREEN CONTROL

- A. The touchscreen controls shall provide the following for the room as indicated on the drawings.
  - 1. Each touch screen control shall indicate the room position (on/off). On the wake-up screen with Warren Conferencing background logo (coordinate with the owner for the back ground logo). The wake-up screen shall also provide for on/off and projection screen indication of position. When the projector and screen are activated, the shades for the room shall close and the front of the room lights turned off (coordinate the presets with the shade and lighting contractors). When the room is set to the appropriate parameters the touch screen shall move to the next page and indicate the input activation for the room(s) The page shall also provide for room off indication without having to revert to the first page. The next page shall provide for the audio control of the rooms for program audio or Bluetooth audio. This page shall also provide for off controls without reverting back to the other pages.
- B. Device Architecture The Touch Screen UI shall be composed of the following functional elements:
  - 1. Graphical touch video display
  - 2. Programmable capacitive buttons
    - 1. Ambient light sensor
    - 2. Built-In camera
    - 3. Built-in microphone
    - 4. Built-in speakers
    - 5. Built-in Bluetooth iOS device proximity beacon
  - 3. Graphical Display
- 1. Graphical UI Touch screen UI display shall support the following viewable elements:

- a. Control buttons and objects
- b. Feedback indication via text, button object changes in color, animated object or graphical element.
- c. H.264 or MJPEG Streaming video
- 4. Brightness Control Graphical UI shall automatically adjust screen brightness based on room ambient light levels.
  - 1. Touch UI Functions
  - 2. Touch Screen UI shall support Multi-Touch control interfacing.
  - 3. Touch Screen UI shall support gesture driven controls through custom programming and configuration.
- 5. Functions The Touch Screen UI shall include:
  - 1. Custom Control UI control of integrated system components through custom programming or preset configuration of the system control processor by same manufacturer.
  - 2. System Integration device shall support controls for compatible integrated AV systems, HVAC and Lighting hardware, and scheduling and management systems.
  - 3. Audio Intercom via Ethernet network.
  - 4. Custom audio feedback via custom programming.
  - 5. Multi-Language support
  - 6. Internet Browsing shall be supported via Ethernet network.
  - 7. Voice Recognition device shall support voice commands control functionality through custom programming and configuration of the system control processor.
- 6. Communication and Power
  - 1. Communication: Bidirectional 10/100 Mbps Ethernet communication.
  - 2. Power: IEEE 802.3af Class 3 PoE Powered Device

7. Physical

1. Touch Screen UI shall be available in the following sizes:

- a. 7-inch TFT active-matrix color LCD touch screen 1024 by 600 WSVGA resolution display.
- b. 10.1-inch TFT active-matrix color LCD touch screen 1280 by 800 WXGA resolution display.
- 2. Touch Screen UI shall include five programmable backlit capacitive control buttons.
- 3. Wired Connection Device shall utilize a single wired connection for power and data communication.
- 2.13 PTZ CAMERA
  - 1. Description- Crestron IV-CAM-P20

The IV-CAM-P20 is a high quality PTZ camera that outputs up to 1080p60 resolution video. The IV-CAM-P20 is ideal for meetings in large to extra-large spaces where camera Signal Formats SDI or HDMI: 1080p60/59.94/50/30/29.94/25, 720p60/59.94/50USB: 1080p30/25, 720p30/25, 360p30 needs to capture several areas of the room. The IV-CAM-P20 can be used with the IV-SAM-VXP-1B Crestron 1 Beyond Automate VX as part of a complete multi-camera switching solution. The IV-CAM-P20 supports a single Ethernet connection and provides power (PoE), viewing, and control on a network.

- 1. Optics and Processing:
  - a. <sup>1</sup>/<sub>2</sub>.8 Sony CMOS sensor
  - b. Optical zoom 20X
  - c. Focal Length F=5.2-94mm
  - d. Field of view horizontal 56.45\*, Vertical 40.31\*
  - e. Shutter Speed 1/50-1/10,000/sec
  - f. Iris F1.5-F3.0
  - g. Minimum Illumination 20lux
- 2. Video Outputs:
  - h. 3G-SDI, HDMI, USB, NDI/HX, ONVIF, RSTP
- 3. Communications:
  - i. USB-B3.0, Ethernet 100Mbps, Serial RS-232, RS-485
- 4. Management Client:
  - j. Software Crestron 1-Beyond Camera Manager (Windows OS computer required
  - k. Acceptable Manufacturer Crestron IV-CAM-P20 in Gray color

Provide Crestron IVA-WMT-BRKT-1B wall mount kit

## 2.14 DIGITAL MEDIA RECEIVER

- A. Description
  - 1. The signal receiver shall receive long distance 4K60 4:4:4 HDR HDMI transmission from compatible transmitter modules or ports. Receiver shall include the following outputs types and connections:
    - a. 4K60 4:4:4 HDR HDMI, HDR and HDCP2.2 compliant
      - 1) Deep Color
      - 2) 3D
    - b. DVI
  - Receiver shall include the following control port types for remote device control.
     a. Serial RS-232 communication.
    - a. Serial RS-232 community
       b. Infrared (IR) control.
  - 3. Input card shall utilize VESA Display Stream Compression (DSC) to handle the extreme bandwidth requirement of resolutions beyond 4K30 4:4:4 and 4K60 4:2:0. DSC shall be applied only to 4K60 4:4:4 and HDR input signals. All other signals

shall be transported uncompressed. The HDMI output port of receiver shall always be an uncompressed signal.

- 4. Receiver unit shall be a direct replacement for non 4K60 4:4:4 HDR version of same device type by the same manufacturer.
- B. Performance

The receiver shall meet the following minimum requirements:

- 1. HDMI digital video, audio, and control output:
  - a. One (1) 19-pin Type A HDMI female connector
  - b. Supports 4K60 4:4:4 HDR HDMI
  - c. Deep Color
  - d. 3D
  - e. Supports HDCP 2.2
  - f. HDMI audio Support:
    - 1) Dolby Digital, Dolby Digital EX, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos, DTS, DTS ES, DTS 96/24, DTS HD High Res, DTS HD Master Audio, DTS:X, LPCM up to 8 channels
  - g. CEC device control.
- 2. Ethernet Port
  - a. One (1) 8-wire RJ-45
  - b. 10/100 Mbps, auto-switching, auto negotiating, auto-discovery, full/half duplex, DHCP
- 3. Single UTP/STP cable transmission connection
  - a. Supports HDBaseT signal specifications.
  - b. HDR10
  - c. Deep Color
  - d. 3D
  - e. 4K60 4:4:4 support
  - f. Supports remote power over UTP/STP cable through matrix switcher or midspan injector.
  - g. The receiver shall support transmissions over manufacturer suggested STP cable, CAT5e or CAT6 cable, or better.
- 4. Power supply:
  - a. Supports remote power over UTP/STP cable through matrix switcher or midspan injector.
  - b. Local DC power source.
- 5. Mounting:

c.

- a. Freestanding.
- b. Surface mount.
- c. Rack rail mount.
- 6. One (1) bidirectional RS-232 port:
  - a. One (1) 5-pin 3.5mm detachable terminal block.
  - b. GND, TX, RX, CTS, RTS support.
  - c. Up to 115.2k baud, hardware and software handshaking support.
- 7. Two (2) IR/Serial ports:
  - a. One (1) 4-pin 3.5mm detachable terminal block.
  - b. IR output up to 1.1 MHz.
    - 1-way serial TTL/RS-232 (0-5 Volts) up to 19200 baud.
- C. Acceptable Manufacturer: Crestron DM-RMC-4KZ-100-C 4K60 4:4:4 HDR receiver

# 2.15 4K WALL MOUNT DISPLAYS

- A. Provide 4K HDR wall mount displays as indicated on the drawings
  - 1. The 4K HDR displays shall have the following features:
    - a. Display resolution (H x V, pixels)
    - b. 3840 x 2160
    - c. HDR (High Dynamic Range) compatibility

- d. HDR10, HLG, Dolby Vision
- e. Aspect Ratio 16:9
- f. Video Processing shall be 4K X-Reality PRO
- g. Motion enhancer Motionflow XR 240 (Native 60Hz)
- h. HDMISignal4096x2160 p(24,60 Hz), 3840 x 2160 p (24, 30, 60 Hz), 1080 p(24,30,60 Hz),720 p(24,30,60 Hz),480 p
- i. IP Control, RS-232C Control, HDMI-CEC
- j. Acceptable Manufacturer: Sony Bravia FW-98BZ53L, FW-75EZ20L and FW-65EZ20L
- k. Refer to drawings for display sizes and locations
- I. Provide Peerless pull out mounts sized for each display
- 2.16 AUDIO VISUAL LOCAL AREA NETWORK SWITCH:
  - A. Provide Crestron CEN-SW-POE30 layer 3 managed network switch for the AV LAN
  - B. The network switch shall have the following features:
    - g. Ports (2) 10/100/1000Base-T auto-sensing Gigabit Ethernet (24) 10/100/1000Base-T auto-sensing Gigabit Ethernet w/PoE+ (4) 10 Gigabit Base-X SFP+ Network Standards IEEE 802.3af, 802.3at MAC Addresses Up to 16K Switch Fabric 132 Gbps non-blocking
    - h. Management Out-of-band; IT Web GUI (main); HTTPs, CLI, Telnet, SSH; SNMP, MIBs, RSPAN; Radius users, TACACS+ IPv4/IPv6 ACL and QoS Ingress/egress; 1 Kbps shaping, time-based; Single rate policing IPv4/IPv6 Multicast Filtering Automated IGMP between switches; IGMPv3 MLDv2 snooping, proxy ASM and SSM; IGMPv1, v2 querier (compatible with v3); Control packet flooding IPv4/IPv6 Policing and Convergence Auto-VoIP; Policy-based routing; LLDP-MED; IEEE 1588 PTPv2 IPv4/IPv6 Authentication Security Successive tiering (DOT1X, MAB, Captive portal); DHCP snooping; Dynamic ARP inspection; IP source guard IPv4/IPv6 Static Routing Port, subnet, VLAN routing; Multicast static routes; DHCPv4 server; DHCP relay; Stateful DHCPv6 Server IPv4/IPv6 Dynamic Routing IPv4: RIP; IPv4/IPv6: PIM-SM, PIM-DM, SSM Spanning Tree Green Ethernet STP, MTP, RSTP; PV(R)STP; BPDU/STRG; EEE 802.3az
    - OOB (1) 8-wire RJ45, female; 10/100/1000Base-T Ethernet port CONSOLE (1) 8-wire RJ45, female USB-C USB-C® port, female 100-240V (1) power connector USB USB Type A, female LED EXT USB-C® port, female 1-24 (24) 8-wire RJ45, female; 10/100/1000Base-T Ethernet ports and PoE Power Sourcing Equipment (PSE) outputs; Supports IEEE 802.3at Type 2 PoE+ power sourcing from any ports up to the maximum specified power capabilities; Maximum 30 Watts per port, 480 Watts total 25-26 (2) 8-wire RJ45, female; 10/100/1000Base-T Ethernet ports. 27-30 (4) SFP+ ports, female; 10 Gigabit Base-X SFP+

### 2.17 INTEGRATED SOUNDBAR MICROPHONE AND CAMERA

- A. Provide integrated soundbar microphone and camera as indicated on the drawings
  - 1. The integrated soundbar, microphone and camera shall be Jabra Panacast 50 black with wall mount adapter

# 2.18 AIR MEDIA WIRELESS GATEWAY

# A. General Functionality

- 1. Content View
  - a. The device shall support dual source view of two separate content devices.
  - b. Content view shall support a light theme and a dark theme background.

## B. User Support

- 1. Status of connected user shall be viewable on status page.
- 2. The device shall support up to ten connected presenter users.

C. The Gateway shall be fully functional as a stand-alone source device when used with a connected display and supported networked mobile device or desktop/laptop.

D. Gateway shall support presentation of content from multiple connection types

E. Acceptable Manufacturer- Crestron AM-3200 with (8) eight air media dongles.

# 2.19 CABLE PROTECTION

- A. Refer to GENERAL Section for additional Manufacturer's requirements.
- B. Cables installed in enclosed bays or furred spaces where conduit stubs are not provided, shall be protected from chafing or any damage. The Installer shall verify that the warranty shall not be violated before installing any cabling in these locations.
- C. Provide bushings in all metal studs and other openings where cables pass through. Bushings shall be of two (2) -piece construction with one piece inserted through the openings and the second piece locking it into place. Single piece bushings with locking tabs or friction fit are specifically prohibited.
- D. Provide sleeves and bushings and seal as required at all penetrations.
- E. Cables damaged during installation shall not be repaired. They shall be completely replaced with new cable.
- F. Provide raceway for cabling installed exposed (not behind building finishes) or where subject to damage or abuse.

# PART 3 - EXECUTION

### 3.1 GENERAL

- A. Prior to bid, inspect the site, existing conditions, fully understand the Work required, and provide the Work per Contract Documents and all existing site conditions. Confer with the Manufacturer's of existing systems to be retained, modified or extended. Include all required costs and components for a fully functional system performing as indicated herein and on the Drawings. No additional compensation will be granted because of existing conditions.
- B. Verify the exact location prior to bid of all items that may be indicated and determine exact location of all items that are not indicated on the Drawings.

- C. Any work installed contrary to the Contract Documents or written directions from the Architect shall be subject to change as directed by the Architect and no extra compensation will be allowed for making these changes or any work of any other trade due to these changes.
- D. Include the cost of all work including sub-letting of any work that may be required to complete the work indicated in order to avoid work stoppages and jurisdictional disputes. The work to be sublet shall conform with precedent agreements and decisions of record. Jurisdictional assignment shall be a responsibility under this Section's contractual obligation.
- E. Do not install equipment and materials, which have not been reviewed by the Architect. Equipment and materials which are installed without the Architects review or without complying to comments issued with the review shall be removed from the project when so instructed by the Architect. No payment will be made for unapproved or removal if it is ordered removed. The Installer shall be responsible for any ancillary costs incurred because of its removal and the installation of the correct equipment and materials.
- F. Manufacturers:
  - 1. Manufacturers shall refer to all parts of the Project Specifications and Drawings to familiarize themselves with all project requirements and include, in cooperation with the Installer, all associated costs.
  - 2. During construction, each Manufacturer or an authorized Representative shall visit the site periodically to observe the installation of projects furnished. Immediately notify the Installer in writing if products are not being installed as recommended by the Manufacturer of the product. Provide copy of notice to the General Contractor and the Architect.
  - 3. Upon completion of the work, each Manufacturer shall certify the installation as indicated under "CERTIFICATES OF APPROVAL".

- 4. When a Manufacturer, or authorized Representative accepts an order for material and equipment, they agree to adjust Submittals and production schedules as required to accommodate the project schedule. Schedules shall be included with Submittals indicating review times as specified herein and manufacturing and delivery times such that material and equipment will be manufactured and delivered to the site sufficiently ahead of schedule so as not to delay the completion of the work.
- G. At the start of construction, consult with the General Contractor and all Trades and determine and verify the telecommunications requirements and characteristics of all equipment which is supplied under the Contract.
- H. Request, in writing, that the General Contractor and each Trade prepare and submit to this Section a complete list of all equipment which they are supplying under their respective Sections which require or effect work under this Section.

- I. Obtain detailed information on installation requirements from the manufacturers of all equipment to be furnished, installed or provided. At the start of construction, check all Contract Documents including all Drawings and all Sections of the specifications for equipment requiring connections and service and verify characteristics of equipment prior to roughing.
- J. Request the General Contractor to provide, as soon as possible after approval, two copies of approved submittals of equipment which require or effect the work of this section. Review these submittals for characteristics and return the submittals to the General Contractor noting any non-agreement within two weeks of receipt.
- K. Equipment and systems shall not be installed without first coordinating the location and installation of equipment and systems with the General Contractor and all other Trades.
- L. Any and all material installed or work performed in violation of above requirements shall be re-adjusted and corrected by the Installer without charge.
- M. Refer to all Drawings associated with the project, prior to the installation or roughing-in of the work and to determine the exact location of all outlets.
- N. Assure that all equipment is accessible, such as junction boxes, pull boxes, and such other apparatus as may require maintenance and operation from time to time. Provide necessary construction access panels sized to provide adequate and required access for installation by the General Contractor. Provide rated panel or door appropriate for the construction being installed into (fire, smoke and/or acoustical).
- O. After installation, equipment shall be protected to prevent damage during the construction period. Openings in conduits and boxes shall be closed to prevent the entrance of foreign materials.
- P. Home runs indicated are not to be combined or reduced without written consent from the Architect.
- Q. Cables and raceway sizes indicated shall be continuous throughout circuit unless otherwise indicated.
- R. All connections to equipment shall be made as required, and in accordance with the approved submittal and setting drawings.
- S. Delivery, Storage and Handling:
  - 1. Deliver, store, protect and handle products in accordance with recommended practices listed in Manufacturer's Installation and Maintenance Manuals.
  - 2. Deliver equipment in individual shipping splits for ease of handling, mount on shipping skids and wrap for protection.
  - 3. Inspect and report concealed damage to carrier within specified time.
  - 4. Store in a clean, dry space. Maintain factory protection or cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic. Heat enclosures to prevent condensation. Meet the requirements and recommendations of NFPA 70B and the Manufacturer. Location shall be protected to prevent moisture from entering enclosures and material.
  - 5. Handle in accordance with NEMA and the Manufacturer's recommendations and instructions to avoid damaging equipment, installed devices and finish.

- 6. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the Manufacturer shall be required to brace the equipment suitably to insure that the tilting does not impair the functional integrity of the equipment.
- T. Site Observation:
  - 1. Site observation visits will be performed randomly during the project by the Architect. Reports will be generated noting observations. Deficiencies noted on the site visit reports shall be corrected. All work shall comply with the Contract Documents, applicable Codes, regulations and local Authorities whether or not a particular deficiency has been noted in a site visit report.
  - 2. Be responsible to notify the Architect ten working days prior to closing in work behind walls, raised access floors, ceilings, etc., so that installed work can be observed prior to being concealed.
  - 3. Work concealed prior to observation and correction of deficiencies shall be made accessible for review at the discretion of the Architect. Bear all costs for allowing worked to be reviewed.
  - 4. Areas shall stay accessible until deficiencies are corrected and accepted. Notify the Architect when all deficiencies are corrected. Return reports with items indicated as corrected prior to re-observation by the Architect.
- U. Change Orders, Modifications, Revisions and Directives:
  - 1. When change orders, modifications, revisions or Architect's Directives are issued or authorized, provide the required additional material, equipment, personnel and workers to prevent delays in the work, and to complete the work within the time limit of the Contract unless a specific time extension is requested with the change and accepted. Include costs for expediting deliveries where required.
  - 2. Requests for additional compensation shall be submitted broken down and associated by item, tasks and Drawing or sketch number with material and labor costs, so quantities can be easily verified.
  - 3. Requests shall be properly and adequately identified so the scope of work can be clearly determined. Indicate who originated change in work.
  - 4. Cost break downs shall be submitted complete with backup for material and labor units and costs. Backup shall consist of actual vendor invoices or quotes, or from well known national organizations such as R.S. Means Company, National Trade Service, Union labor rates or approved equal. Installing firm's in-house standard database for labor units may be used if consistent with the national organizations.
  - 5. Submit on all credits broken down as requested for adds. Credits shall be separately identified and accounted for. Do not indicate as net changes with adds.
  - 6. Unit costs for labor and material shall be equal for adds, deletes and credits.
- V. Schedule of Values:
  - 1. Provide a schedule of values breaking down the contract price when requested.

- 2. The schedule of values shall be submitted for review and acceptance prior to the paying of any invoice.
- 3. The schedule shall accurately reflect the actual costs for each category including allocation for overhead and profit.
- 4. Provide a schedule of values as required by the Contract Documents, the General Contractor and the Architect. As a minimum, provide the following breakdown as indicated here (by phase where applicable):
  - a. Material and labor for each item.
  - b. Follow the Architects cost estimate format and breakdown (request a copy from the Architect through the General Contractor).
  - c. Each major piece of equipment.
  - d. Other equipment by category.
  - e. Equipment installation by category and each major piece of equipment.
  - f. Underground work.
  - g. Roughing work.
  - h. Finish work.
  - i. Coordination.
  - j. General Conditions.
  - k. Bond.
  - I. Testing.
  - m. Owner training.
  - n. Operation and Maintenance Manuals.
  - o. Record drawings.
  - p. Acceptance Demonstrations.

# 3.2 EQUIPMENT RACKS AND BRACKETS

- A. Securely mount equipment racks, cabinets and wall mounted relay brackets to the building structure. Provide Seismic bracing for Seismic Zone 2. Proper supports such as 3/8" lag screws and expansion anchors shall be used. Proper quantity of supports shall be utilized. Dry wall screws and other types of supports not specifically approved to support equipment are specifically prohibited. Submit mounting supports for approval before installation.
- B. Position racks and cabinets in order to have minimum 42" clearance for easy access. Equipment racks, cabinets, and relay brackets mounted on or against walls shall have 42" clearance. Equipment racks and cabinets shall have 42" clearance in front and rear. Provide 3-foot clearance between equipment racks or cabinets and any other obstruction to allow access from front to rear of rack or cabinet for maintenance.

- C. Provide cable tray over each rack as required to facilitate a neat and orderly installation of cables and to secure the top of the racks to the structure. Cables shall drop straight down with proper bend radius support (i.e. waterfalls) to equipment racks. Cable trays shall be secured at both ends to the structure and connected together as required for a complete contiguous installation. Utilize proper supports to support the cable tray to the building structure as well as the equipment rack and cabinet. Submit mounting supports for approval before installation.
- D. Install terminating components such as patch panels cable management, etc., into the racks, cabinets and wall mounted relay brackets.
- E. If the building size or layout is such that, given the segment length restrictions, then additional racks shall be placed in remote Telecommunications Rooms or equipment cabinets shall be provided to satisfy all network requirements.
- F. Coordinate power requirements with the General Contractor. It is this section's responsibility to provide additional power requirements for their equipment that has not been provided in the Drawings and Specifications of Division 260000.

### 3.3 TERMINATIONS

- A. All copper and fiber conductors of every cable shall be completely terminated at both ends.
- B. Terminations shall be as indicated under the type of cabling specified in Part Two of the Specifications.

# 3.4 CABLE PATHWAYS

- A. Install cables in pathways provided under Section 260000 or required under the execution part of this section.
- B. Provide all equipment and cabling for a complete installed operating system. In general, pathways, outlet boxes and grounding are provided under Section 26 00 00. However, it is the Installers responsibility under this Section to coordinate with the Drawings and Specifications for Section 260000 and to provide all pathways and outlet boxes required that are not provided under Section 260000.
- C. All pathways provided under this Section shall comply with fill capacities as per the Electrical Code
- D. Cable bending radius shall not be less than minimum required by EIA/TIA
- E. Cabling installed concealed shall be supported from the building structure (e.g. cable trays, "J" hooks, etc.).
- F. At a minimum, exposed cabling, and support fastening mechanisms installed in return air plenums shall be plenum rated.
- G. Cables shall be installed no closer than 12 inches (305mm) to electrical equipment and wiring. When cables are required to cross power wiring, they shall only do so perpendicular to the power wiring. A/V cabling and power wiring shall only cross each other the minimal number of times as required due to building design limitations.
- H. Clearances: Clearances between cabling and other building systems as required by ANSI/TIA/EIA-569-A shall be maintained throughout the building.

- I. All cables shall be installed in a neat and workman-like manner. Cables shall be installed parallel and perpendicular to building elements.
- 3.5 FIRE, SMOKE, ENVIRONMENTAL AND ACOUSTICAL SEALING OF PENETRATIONS AND OPENINGS
  - A. Environmental Seals
    - 1. Provide seals on raceways exposed to widely different temperatures, as in refrigerating or cold storage areas. Install seal to prevent circulation of air from warmer to colder sections through the raceway.
    - 2. Provide seals under device plates for outlets on walls between conditioned and non-conditioned spaces.
  - B. Smoke and Fire Stopping Seals
    - 1. Provide a seal around raceways or cables penetrating full height walls (slab to slab), floors or ventilation or air handling ducts so that the spread of fire or products of combustion shall not be substantially increased.
    - 2. Penetrations through fire-resistant-rated walls, partitions, floors or ceilings shall be firestopped using approved methods and NRTL listed products to maintain the fire resistance rating.
    - 3. Installation restrictions of the listing agencies shall be strictly adhered to (e.g. 24 inch (610 mm) minimum horizontal separation between boxes on opposite sides of the wall, maximum square inch opening in wall).
    - 4. Fire stopping in sleeves or in areas having small openings that may require the addition or modification of installed cables or raceways shall be a soft, pliable, non-hardening fire stop putty. Putty shall be water resistant and intumescent.
    - 5. Firestopping in locations not likely to require frequent modification shall be a NRTL listed putty to meet the required fire resistance rating.
    - 6. Box penetrations into a fire rated wall or shaft shall have a firestopping putty pads installed on the back of the outlet box.
    - 7. Temporary firestopping of cable trays through walls shall be with NRTL listed bags (normally not approved as permanent firestop system) to meet the required fire resistive rating and that will not allow products of combustion to pass through the protected opening. The NRTL listed bags shall be installed inside and on both sides of the opening as required to meet the required resistive fire rating of the wall.
    - 8. Firestopping materials shall be NRTL listed to UL 1479 (ASTM E-814). Installation methods shall conform to a UL® listed firestopping system. Submit specifications and installation drawings for the type of material to be used. Firestopping materials shall be as manufactured by 3M, International Protective Coatings Corp., Specified Technologies, Inc., Carborundum Company, RayChem, Nelson Fire Stop or approved equal.

# 3.6 INSTALLATION

A. Provide all programming to all equipment for a complete installation. Coordinate the touch panel look with EMC and provide all integration with EMC provided content servers.

- B. The programming of all equipment shall be coordinated with EMC 30 days before system is complete.
- C. Coordinate the placement of projectors in the Gyp board ceilings with the GC and test all placements with the desired view on the screens or walls before the ceiling is painted. Coordinate the placement of access panels for the in ceiling projectors and the Flexible picture equipment.
- D. Coordinate the placement of all projectors in the briefing rooms so there is no conflicts with other ceiling mounted devices.
- E. All cabling shall be installed in conduit or cable tray where indicated on plans or shall be installed using approved "J" hooks or other approved open-top supports. The supports shall be spaced no further than five feet apart.
- F. Use industry standard color codes and maintain consistent color-coding throughout the building.
- G. All equipment, materials and devices listed and inferred shall be furnished and installed under this section unless noted otherwise.
  - 1. Refer to the Drawings for locations and quantities.
  - 2. Refer to Part 2 Products of this specification for additional information.

# 3.7 SLEEVING AND BUSHINGS

- A. Raceways and openings shall be laid out in advance to permit their provision in the work. Sleeves and raceway shall be set before masonry is constructed. Any extra work required where sleeves or raceways have been omitted or improperly placed shall be performed at the expense of the Installer which made the error or omission, including coring.
- B. Provide sleeves for raceways and cable trays penetrating floors, fire walls, or smoke partitions. Install approved material to provide for fire stop.
- C. Provide waterproof seals inside and outside raceway when penetrating from the exterior or underground.
- D. Except where specified otherwise sleeves shall be made of galvanized metal to finish flush with building finish lines.
- E. Provide acoustic sealer in sleeves between occupied spaces.
- F. Sleeves installed in floors shall extend two inches above the finished floor unless specifically indicated otherwise.
- G. Provide sleeves in masonry construction and in full height (slab to slab) walls.

# 3.8 CABLE PROTECTION

- A. Cables to be installed in existing enclosed open bays or furred spaces where conduit stubs are not provided, shall be protected from chafing or any damage. The Installer shall verify that the warranty shall not be violated before installing any cabling in these locations.
- B. Provide bushings in all metal studs and other openings where cables will pass through. Bushings shall be of two (2) piece construction with one piece inserted through the

openings and the second piece locking it into place. Single piece bushings with locking tabs or friction fit are specifically prohibited.

- C. Provide cutting, coring, sleeves and bushings and seal as required at all penetrations.
- D. Cables damaged during installation shall not be repaired. They shall be completely replaced with new cable.

### 3.9 DOCUMENTATION

- A. Label all equipment as specified above
- B. Provide the Owner with:
  - 1. Hard copy documentation of "As-Built" A/V Systems Administration Reports.
  - 2. "As-Built" drawings indicating location of all equipment including but not limited to work area outlets, patch panels, cross connect blocks, on each segment and cable routing. Indicate labeling for each piece of equipment.
  - 3. Refer to Part One for additional documentation.

### 3.10 SYSTEM ACCEPTANCE

A. Obtain written acceptance from the Owner or their authorized representative for each cabling system installed on this project. Failure to obtain written acceptance shall result in delay of start of warranty period. No claim for additional costs will be allowed due to not receiving written acceptance. Warranty period will start upon receipt of written acceptance.

## 3.11 ACCEPTANCE DEMONSTRATIONS

- A. Systems installed under this section shall be demonstrated to the Owner and Architect. Demonstrations are in addition to necessary testing and training sessions. Notify all parties at least 7 days prior to the scheduled demonstration. Schedule demonstrations in cooperation with and at times convenient to all parties and so as to not disturb ongoing activities.
- B. Systems shall be tested prior to the demonstrations and each system shall be fully operational and tested prior to arranging the Acceptance Demonstration. Final payments will be withheld until a satisfactory demonstration is provided for all systems indicated or requested.
- C. If the demonstration is not totally complete, performing all functions, features and connections or interfaces with other systems, or if there is a failure during the demonstration, additional demonstrations shall be arranged. Provide and pay for all costs, labor and expenses incurred for all attendees for each additional demonstration required for acceptance and demonstration of complete system operation.
- D. Demonstrations shall be scheduled in ample time to complete all activities prior to final acceptance and Owner occupancy. Demonstrations shall take place at least 30 days prior to the scheduled project completion date and 30 days prior to owner's use and occupancy.
- E. As a minimum, provide demonstrations for systems indicated under "Work Included" under Part One of the Specifications. Provide demonstrations of additional systems as requested by the Owner or Architect.

#### 3.12 PROJECT OWNER COORDINATION

- A. Prior to Substantial Completion of the project and in ample time to address and resolve any coordination issues, request and arrange meetings between the Owner, Owner's Vendors and Consultants, Architect, and General Contractor to discuss the Scope of Work for each system being provided and the interface required for a fully functional and operational system upon project completion. Initial meetings shall be scheduled three months prior to the scheduled Substantial Completion date or as soon as Submittals are submitted and reviewed for projects with shorter schedules.
- B. At these meetings the required interface with the Owner shall be reviewed, requests for information required to complete programming or for coordination shall be presented and system operation and philosophy shall be discussed.
- C. Additional meetings shall be held as requested by any party so that all issues are resolved and with the goal and intent being that all systems are fully operational and functional upon project Substantial Completion and that the responsibility for all components required is clearly established.

#### 3.13 CLEANING UP

- A. Upon completion of all work and testing, thoroughly inspect all exposed portions of installation and completely remove all exposed labels, markings, and foreign material.
- B. The interior of all equipment and cabinets shall be left clean; exposed surfaces shall be cleaned and plated surfaces polished.
- C. Repair damage to finish surfaces resulting from work under this section.
- D. Remove material and equipment from areas of work and storage areas.
- E. All equipment shall be clean from dirt, dust, and fingerprints prior to final acceptance.
- F. Touch up all damaged pre-finished equipment using materials and methods recommended by the Manufacturer.

### 3.14 PROJECT CLOSEOUT

- A. Provide close out submittals as required herein and in Division One including the following close out submittals.
  - 1. Operation and Maintenance Manuals
  - 2. Record Drawings.
  - 3. Test Reports.
- B. Obtain written receipts of acceptance close out submittals submitted. Receipts shall specifically detail what is being delivered (description, quantity and specification section) and shall be dated and signed by firm delivering materials and by the Owner's Representative.
  - 1. Provide record drawings indicating actual cable routings and cable terminations and all required identifiers.

### END OF SECTION 27 41 16

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## PART 1 - GENERAL

- 1.1 GENERAL
  - A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 GENERAL REQUIREMENTS, which are hereby made a part of this Section.
  - B. The card access system have been designated as a "Proprietary Product" to match and integrate with the city's system.

### 1.2 REFERENCE TO GENERAL CONDITIONS

- A. The General Conditions shall be considered as forming an integral part of the specifications and shall be carefully examined before bid for any work submitted.
- B. Definitions: In addition to the definitions outlined in the General Conditions, the following definitions shall apply to this Section of the Work:
  - 1. Security System: The Security System shall consist of card access system, Intrusion Detection System (IDS) Access Control, and Equipment Racks (if required), all applicable wire and cable, and the functional integration of all subsystems through subsystem interfaces as specified herein.
- 1.3 SUMMARY
  - A. Scope of Work
    - 1. The card access system basis of design is Avigilon Alta cloud-based ACS solution with the latest software, licensing, and mobile access at the time of installation.
      - a. ACS System (panels, readers, software, power supplies) shall work in junction with Schlage wireless locks within the suites.
        - 1) Wireless Lock requirements:
          - a) Premium subscription (ordered online)
          - b) SW-PRM-P5
          - c) SW-ALLE-OPP5
          - d) SYS-8ENT-DVE2
          - e) OP-R2X-STND
          - f) OP-VID-PRO-INT
          - g) NDEBBD-RHO-626-13-247-47267101
          - h) AD-400-993S-70-MT-RHO-626-B-RHR-4B-1 <sup>3</sup>/<sub>4</sub>"
          - i) AC-ALL-SCH-PIM400-TD2
          - j) OP-LOCK-GW

NOTE: AD400 doors will require the vertical rods and crashbar changed (Von Duprin 22, 2227-EO-SP28-3' or Von Duprin 99, 9927-EO-US26D-3')

b. Front entrance shall include a video intercom with card reader capabilities.

- c. Wireless locks and gateway shall be Allegion/Schlage. Wireless locks shall be integrated with ACS.
- d. Security Contractor shall coordinate with door hardware for lock installation and integration.
- 2. The Intrusion detection system shall be Honeywell 128 intrusion panel. This panel is for the motion sensors, door contacts, and panic buttons (if required) and will be set to 24 hour alarm to the police.
- 3. The Security contractor shall provide a fully integrated Security System and applicable wire and cable for this project.
- 4. The electrical contractor shall provide all back boxes, conduit, 120VAC power, and fire alarm relays as indicated on the security drawings.
- 5. The Security contractor shall provide coordination with security door hardware. Coordinate door hardware with the Architect and the hardware engineer. Refer to Division 8 for additional scope of work.
- 6. The Security contractor shall be responsible for providing complete, and working systems.
- 7. All penetrations shall contain UL listed fire stopping as required by code which shall be installed by the security contractor or general contractor/construction manager.
- 8. All door hardware is by the division 8 contractor, wireless locks shall be provided by security contractor.

All device cabling shall be routed to the termination points as shown on the security riser system drawing and part plans on where the security data gathering panels, transformers, and Power Supplies, etc. located therein. The Contractor shall provide copper cabling from the data gathering panels to the doors.

- 9. Related Work: The following items are not included in this Section and will be performed under the designated Sections. Security contractor to coordinate with the following. Refer to each trade construction documents for additional scope of work:
  - a. Division 27 Sections TELECOMMUNICATIONS
  - b. Division 8 OPENINGS
  - c. Division 11 Sections VEHCLE AND PEDESTRIAN EQUIPMENT
  - d. Division 25 INTEGRATED AUTOMATION
  - e. Division 26 -ELECTRICAL
- B. REFERENCES: The security system shall be installed in accordance with all applicable national, state and local codes including but not limited to the most recent editions of the following:
  - 1. National Fire Protection Association, 2015 (NFPA 70)

- 2. National Fire Protection Association Life Safety Code, 2015 (NFPA 101)
- 3. Building Officials & Code Administrators International, Inc. (BOCA) National Building Code
- 4. Americans with Disabilities Act (ADA)
- 5. Underwriters Laboratories (UL) Applicable Standards for Safety
- 6. Underwriters Laboratories (UL) Applicable Standards for Proprietary Security Systems
- 7. Uniform Building Code, 2015 (UBC)
- 8. Open network video interface forum (ONVIF) standards and compliance
- 9. International Building Code (IBC), 2015
- 10. ANSI/BICSI 005-2016 Electronic Safety and Security Design and Implementation

# 1.4 SUBMITTALS

- A. General Description and Requirements
  - 1. Submit Submittals in accordance with the construction schedule.
  - 2 Submittals shall consist of Product Data Sheets with Part Numbers Highlighted, Shop Drawings which shall include Symbols Lists, Floor Plans, Security Room Part Plans, Wall Field Elevations, Equipment Rack elevations, Component Installation Details, and Detail Riser diagrams for each system, Samples as requested, all Required State Licenses for both the contracting corporation, and their employees, Manufacturer's Certifications (2 minimum) and a detailed completion schedule. Partial submittals will not be accepted.
  - 3. No portion of the Work shall commence nor shall any equipment be procured until the Pre-fabrication Submittals have been approved.
  - 4. Submittals shall be accompanied by a letter of transmittal identifying the name of the Project, Contractor's name, date submitted for review, and a list of items transmitted.
- B. Samples
  - 1. The Contractor shall submit samples of any equipment components upon request of the Architect.
- C. Record Documentation

- 1. Prior to any final acceptance testing, submit one set of preliminary (draft) record drawings to the Architect. The preliminary record drawings are to be used by the Engineer to conduct the system final test.
- 2. Upon final acceptance of the work, the Contractor shall submit 3 Hard copies, and 1 soft copy of the record documentation within 30 days from the date of final acceptance to the Architect/Owner.
- 3. Record documentation shall include all information required in the submittals but revised to reflect as installed conditions. Record documentation shall include the following:
  - a. Operation and maintenance manuals for all devices, equipment and software modules.
  - b. Floor plan drawings indicating device locations with device legends indicating manufacturers and model numbers for each device.
  - c. Floor plan drawings indicating conduit and wire routing and junction box locations. Wire routing shall include cable identification and terminal strip numbers.
  - d. Mounting details for all equipment and hardware.
  - e. Functional block diagrams for each system.
  - f. Wiring details showing rack elevations, equipment wiring, terminations and inter-rack wiring.
  - g. Wiring diagrams for all custom circuitry.
  - h. Wiring diagrams for each Data Gathering Panel.
  - i. Point to point wiring diagrams.
  - j. Layout details for each riser location, including security panels, power supplies, junction boxes, conduit and any other security-related equipment located in the riser.
- 4. All record documents shall be supplied in both hard copy and in an electronic format as required by the Project at time of submittal.
- 5. Operation and Maintenance (O&M) Manuals
  - a. Operation and Maintenance Manuals shall include, as a minimum, the following:
    - 1) Operational description of each subsystem.
    - 2) Detailed programming descriptions for each subsystem, including step-by-step procedures with illustrations identifying how computer screens will appear after each entry.

- 3) Explanations of subsystem interrelationships. Explanations shall include operations of each subsystem and operations unique to the interfaces between each of the subsystems and possible conflicts that may occur with the interfaces. Each explanation shall be identified, tagged, bound and indexed into a single binder.
- 4) Electrical schematics for each piece of equipment specified.
- 5) Power-up and power-down procedures for each subsystem.
- 6) Description of all diagnostic procedures.
- 7) A menu tree for each subsystem. The tree shall provide a graphical flow of commands within the menu system.
- 8) Setup procedures for each component of the subsystems.
- 9) A list of manufacturers, their local representatives and Integrators that have performed Work on the Project. The list shall include contact names, phone numbers and addresses for each.
- 10) Installation and service manuals for each piece of equipment.
- 11) Maintenance schedules for all installed components. Schedules shall include inspections and preventative maintenance schedules, and documentation of all repaired or replaced equipment.
- b. Operation and Maintenance Manuals shall include a separate section for each software program incorporated into the Project. The software section shall include, at a minimum, the following information:
  - 1) Definitions of all software related terms and functions.
  - 2) Description of required sequences.
  - 3) Directory of all disk files.
  - 4) Description of all communications protocols, including data formats, command characters, and a sample of each type of data transfer.
  - 5) Instructions for manufacturer supplied report generation with illustrations showing what reports should look like and screen-by-screen illustrations for each entry made.
  - 6) Instructions for custom report generation.
  - 7) Database format and data entry requirements.
- c. As a minimum training sessions shall consist of the following:

- 1) General project information and review shall be by the General Foreman or Superintendent of the Trade.
- 2) Specific system training shall be by a Factory Trained Representative.
- 3) Provide a complete review of the project and systems including, but not limited to, the following:
  - a) Note equipment layouts, locations and control points.
  - b) Review each system.
  - c) Review system design operation and philosophy.
  - d) Review areas served by equipment.
  - e) Identify color codes used.
  - f) Review features and special functions.
  - g) Review maintenance requirements.
  - h) Review operation and maintenance manuals.
  - i) Respond to questions
- 4) After classroom training, walk the entire project, review each equipment room and typical locations. Explain equipment and proper operation.

### 1.5 QUALITY ASSURANCE

- A. Contractor Qualifications: The Bidder shall provide information in the proposal to demonstrate compliance with these requirements.
  - 1. Work specified herein shall be the responsibility of a single electronic security systems integration contractor.
  - 2. The security contractor shall have local in-house engineering and project management capabilities consistent with the requirements of the Work. The Contractor shall provide a team supervised by a full-time on-site foreman who is to be present at all times that Work is actively in progress. The Contractor shall provide a team managed by a full-time project manager who is to be present at all construction meetings and available to answer all questions by the Architect or the construction team.

- 3. By submitting a Bid, the Contractor thereby certifies that it is qualified in all areas pertaining to, either directly or indirectly, the Work. In the event the Contractor becomes unable to complete the Work in accordance with the Contract Documents, or the satisfaction of the Owner or its representatives, due to a lack of understanding of equipment, systems or services required by the Contract Documents, it shall be the responsibility of the Contractor to retain the services of the applicable manufacturers' representatives to expeditiously complete the Work in accordance with the construction schedule at no additional cost.
- 4. The Contractor shall maintain, or establish and maintain, a fully staffed local office including a service center capable of providing warranty and service to the Security System for the Project. The Contractor shall staff the service center with factory trained technicians and adequately equip the office to provide emergency service within 4 hours after being called, 24 hours per day, whether or not the Owner elects to purchase a maintenance contract from the Contractor.
- 5. The Contractor shall provide factory-certified technicians with the latest and most advanced training on the specified SMS/IDS software/hardware, workstations and data gathering panels. These certified employees shall provide the installation of, and commission of, the Work. All installing personnel shall also be licensed as required by local and/or state jurisdictions. The Contractor shall provide all licensing documentation as part of the submittal process.
- 6. The Contractor shall ensure compliance with, and have a thorough understanding of, all local codes and contract conditions pertaining to this Project.
- 7. The Security contractor shall maintain an inventory of spare parts in house and other items critical to system operation and as necessary to meet the emergency service requirements of this Project within the local service center. A current inventory list shall be provided for within the submittal. Spare parts shall include, but not be limited to, the following:
  - a. SMS
    - 1) Data Gathering Panel (including all boards)
    - 2) Door controllers
    - 3) Input/Output boards
    - 4) Card readers
    - 5) Video Intercom
    - 6) Wireless Locks and Gateways
    - 7) Door position switches
    - 8) Request-to-exit motion sensors
    - 9) Power supplies

- B. Product Standards
  - 1. All materials (except those existing materials or materials provided by other Sections and specified for incorporation in the completed work) included in the completed security system installation shall be new, not refurbished and shall fully comply with the latest published specifications of the manufacturer.
  - 2. Unless otherwise specified, all components included in the completed security system shall be standard, unmodified production models.
  - 3. Equipment that is installed, maintained, serviced, programmed, etc. by a single representative due to proprietary equipment and/or manufacturer region exclusive agreements shall not be acceptable. All equipment proposed by the Contractor shall be available to at least, three dealer/installer representatives, minimum, within a 50 mile radius of the Project site.
  - 4. All equipment, components and materials provided by the Contractor shall, in every respect, meet or exceed the performance characteristics and technical specifications for referenced components.
  - 5. It shall be the responsibility of the Contractor to provide complete and detailed technical information for all equipment, components and materials. In the event that submitted technical information is not sufficient to permit the Engineer to readily confirm that proposed equipment, components and materials will meet or exceed the performance and technical specifications, the proposed equipment, components or materials shall be rejected. The Engineer shall determine the final decision as to whether proposed equipment, components and materials are acceptable. In no case shall acceptance by the Owner of proposed equipment, components and materials relieve the Contractor of his responsibility to produce completed systems, which comply with these specifications.
  - 6. Within the technical specifications for the system, certain manufacturers may be specified. These manufacturers are listed for example purposes only.
  - 7. Provide at the time of installation the latest version of all equipment and software.
  - 8. The systems (including software, hardware and firmware) proposed for this project shall have been installed in at least five projects of similar size and nature and shall have been in beneficial use for at least six months prior to submission of the bid proposal. Provide a compliance statement from each manufacturer along with references.
  - 9. All exterior devices shall be sealed and protected against all weather conditions including heat, cold, moisture, dust, and sand.
  - 10. As Part of the Submittal process, the Security Contractor shall provide unit pricing for all components, hourly labor rate for all parties involved in the project (foreman, installer, PM), and installation costs for each component. Assume a 300ft run for each. Installation cost shall be broken out by materials and labor.

### 1.6 WARRANTY

- A. Provide a two-year warranty on the Work. If, within the two years after the date of final acceptance of the Work or within such longer period of time as may be prescribed by law, or by the terms of any applicable special warranty required by the Contract Documents or provided by a manufacturer, any of the Work or equipment is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly including all parts and labor after receipt of notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such non-conforming condition. This obligation shall survive termination of the Contract. The Owner will give such notice promptly after discovery of the condition.
- B. Nothing contained in the Contract Documents shall be construed to establish a shorter period of limitation with respect to any other obligation that the Contractor might have under the Law, the Contract Documents, or any manufacturer's warranty. The establishment of the time period of one
- C.
- 1. During the Warranty period, the Contractor shall, upon receipt of a request for service form the Owner, deploy service personnel to the Owner's premises within four hours (After hours time included) to initiate corrective action.
- 2. All Warranty service and repair work shall be performed by personnel who have been trained, certified and are experienced in the operation and maintenance of the installed system(s).
  - a. Warranty service shall include the replacement of all parts and/or components as required to restore normal system operation. In the event that system parts or components must be removed for repair, it shall be the responsibility of the Contractor to furnish and install temporary parts and/or components as required to restore normal system operation until the repaired parts or components can be repaired and re-installed.
  - b. It shall be the responsibility of the Contractor to maintain an inventory of spare parts or to arrange for manufacturer parts support as required to ensure correction of all critical component failures or malfunctions within 48 hours of the Owner's request for service. Critical parts shall be defined as those, which govern or affect the normal operation of more than one field device.
  - c. The Contractor's Warranty obligation shall include correction of any software/firmware defects, which may be identified during the Warranty period. Any failure of the software/firmware to perform as specified by the software/firmware manufacturer at the time of final acceptance shall be defined as a software/firmware error.
  - d. In the event that the Contractor determines and demonstrates to the Owner's sole satisfaction that service or repairs are required as a result of misuse, abuse or abnormal wear and tear, the Contractor shall be compensated for such service or repairs as agreed upon by the Contractor and Owner. Similarly, such compensation to the Contractor shall apply in

the event that repairs are required for devices and equipment not provided by the Contractor but incorporated in the completed systems.

- e. Immediately following the completion of a Warranty repair or service call, the Contractor's service personnel shall submit a written report to the Owner which details the service work performed, the cause of the trouble, and any outstanding work which is required to restore complete and normal operation.
- D. Perform preventative maintenance during the warranty period. Submit a list of items to be included in the preventative maintenance program in the submittal process. The list shall include maintenance to each item, the frequency of such maintenance, and the amount of time to be spent on each item for maintenance. Preventative maintenance shall include, but not be limited to, the following.
  - 1. Annual Preventative Maintenance: Test and adjust system sensors.
  - 2. Semi-Annual Preventive Maintenance
    - a. Inspect and clean all Data Gathering Panels.
    - b. Inspect, test, and clean power supplies. Replace batteries as necessary.
    - c. Inspect, clean and vacuum all equipment racks.
  - 3. Quarterly Preventive Maintenance
    - a. Run SMS system diagnostics and perform file maintenance to insure optimal performance.
    - b. Provide Security System Software updates as required.
- E. Include a manufacturer's software support agreement as part of the Warranty. This agreement shall include all software updates, revisions, telephone service assistance and training for any changes in operation.
- F. Provide written notice to the Owner documenting any work performed during the warranty period, including any preventative maintenance work performed.
- G. Provide loaner equipment for any equipment not field repairable. Such loaner equipment shall be in working order and the functional and technical equivalent of the item replaced.
- H. Provide loaner equipment that is fully compatible and fully functions with all associated equipment.
- I. Loaner equipment for system components (example: card readers, video intercom, etc.) that must be shipped from the manufacture or distributor shall be on site and operational within 48 hours of the component failure. Furnish lists of equipment that will require shipment from the manufacturer or distributor and lead times associated with that equipment.
- J. Repair or Replacement Service

- 1. Repair or replacement service during the warranty period shall be performed in accordance with the following:
  - a. Major system components including, but not limited to, the SMS system workstations, data gathering panels (Data Gathering Panels): 7 days, 24 hour, 2 hour response time.
  - b. All other components and devices: 7 days, 24 hour, 4 hour response time.
- K. If the Contractor is unable to restore system operation during the warranty period within one business day of a system failure, the Owner reserves the right to require the Contractor to provide on-site manufacturer's service technicians at no additional cost.
- L. The Owner reserves the right to expand or add to the system during the warranty period using firm(s) other than the Contractor for such expansion without affecting the Contractor's responsibilities, provided that the expansion is done by a firm which is an authorized dealer or agent for the equipment or system being expanded.
- M. Provide on-line software maintenance and support during the warranty period including all software and hardware updates for all provided equipment. It is up to the contractor to inform the building management about all updates during the warranty period.

## PART 2 - PRODUCTS

- 2.1 SECURITY MONITORING SYSTEM (SMS)
  - A. System Architecture
    - 1. General
      - a. The Security Monitoring System (SMS) consists of cloud based software, system workstations (by owner), printers (by owner), enrollment readers and card readers, Reader Boards, I/O Boards, and Intelligent IP controllers, provide new data gathering panels as indicated on the drawings.
      - b. The SMS workstations shall communicate with the owners SMS cloud system an Owner provided enterprise network. Interface with communications outlets located in the main telecommunications equipment room, and the security monitoring station. Configure the SMS workstation ancillary equipment. Coordinate with the Owner for naming conventions, IP address programming, and switch port connections to the network for all devices and panels
      - c. All SMS network devices shall synchronize their system time with the owner's network time source. SMS software shall not impede use of the NTP or SNTP protocols, MD5 authentication algorithm or the operating system's NET TIME command.

### 2.2 CLOUD-BASED ACCESS CONTROL SOFTWARE

- A. Design: Avigilon Alta Access, by Motorola Solutions Inc.
- B. Operating System: Cloud-based software hosted on AWS Cloud Services.
- C. Access Control Software Capacities: Cloud-based storage supports unlimited users, groups, hardware, entries, schedules, rules, alerts, and alarm configurations.
  - 1. Intelligent Controllers: Unlimited per appliance allowing geographic independence from appliance via IP communication.
  - 2. Access Control System Appliances Supported: Unlimited.
  - 3. Events Stored: Unlimited.
  - 4. Sub-Panels: Unlimited.
  - 5. Doors: Unlimited.
  - 6. Time Schedules: Unlimited.
  - 7. Identity and Operator Database: Unlimited.
  - 8. Client Connections: Unlimited.
  - 9. Rules: Unlimited.
  - 10. Alarm Configurations: 100.
  - 11. Open Alarms: 100.

# 2.3 CLOUD-BASED ACCESS CONTROL SOFTWARE ADMINISTRATION

- A. Updates: Provide access control software capable of automatically updating the following:
   1. Administrative Software: Version, service packs, and security vulnerabilities.
  - Field Devices: Firmware versions.
- B. Upgrade Functionality: Provide access control software capable of automatically upgrading software licensing.
- C. License Requests: Provide access control software capable of managing license and feature requests from customer accounts.
- D. Multi-factor authentication in access control software:
  - 1. Provide ability for administrator to enforce MFA in users and roles.
  - 2. Provide ability for user to use a TOTP-compatible app for authentication.
- 2.4 CLOUD-BASED ACCESS CONTROL SOFTWARE INTERFACE
  - A. Web-Based Access Support: Provide access control software with browser-based access to system applications including support for industry-standard desktop and mobile web browsers.
  - B. Language Support: Provide software in English, German, French, Italian, or Spanish based on the browser locale or user preference.
  - C. Dark mode, light mode, and OS theme options for users.
  - D. Events and Alarms: Provide system that allows administrators to configure email and SMS alerts for the following:
    - 1. Entry and user events including forced entries, ajar entries, unlock failures, authentication failures, authorization failures, and/or anti-passback breaches.
    - 2. Hardware input and relay state changes.

- 3. Identity provider synchronization.
- 4. Billing: Payment due dates, expired Terms and Conditions, and/or when the account is frozen.
- 5. Offline controllers and tamper alerts.
- 6. Motion and sound detection.
- 7. Occupancy limits reached.
- 8. Low battery, tamper, and offline alerts for wireless locks.
- E. Entry Schedules: Provide system that allows administrators the ability to create entry schedules and default entry states.
- F. User Schedules: Provide system that allows administrators the ability to create user schedules and default entry states.
- G. Identity Records: Provide a system with integrated identity management, allowing imports of data from supported integrations and via CSV upload. Each identity supports access control based on groups and roles as well as individual overrides. Provide identity records capable of management and synchronization between multiple sites. Create users, assign credentials, and define entry access.
  - 1. All-access credentials for first responder use: Issue an all-access credential to access all entries in all zones in a site during emergency situations.
- H. Custom Fields: Create custom user fields.
- I. Roles: Support a role-based permission method allowing one or more roles to be assigned to identities to determine physical and logical access.
- J. Custom Read/Writer Permissions: Create custom roles with granular read/write permissions for Administrators in the portal.
- K. Anti-Passback: Provide access control software capable of designating areas to require a credential to enter and exit the area before it is used to enter the area again.
  - 1. Soft and Hard Area APB: Tracks each credential that enters an area and defines which areas the badge may access next.
- L. Physical Badging: Provide a tool to support the creation of custom badge layouts including the following content:
  - 1. Static Information: Badge size, background color, text strings, and graphics common to every badge.
  - 2. Dynamic Information: Text fields and images from the identities database unique to each badge.
- M. Digital Badging: Provide a tool to support the creation of custom digital badge layouts for mobile credentials including the following content:
  - 1. Static Information: Badge size, background color, text strings, and graphics common to every badge.
  - 2. Dynamic Information: Text fields and images from the identities database unique to each badge.
- N. Enrollment: Provide integrated identity management and enrollment functionality as part of the core system functionality.
  - 1. Allegion Schlage credential enrollment readers: Automatically added by syncing the access control software with the commissioned ENGAGE site.

- O. Rules Engine: Provide system capable of linking one or more events and conditions to rules that trigger actions and alerts. Create conditional rules that trigger specified actions based on entry events, input state changes, user activity, lockdown activity, identity provider issues, and hardware relay changes. Use GUI to create input-related or event forwarder rules, or use JSON to create custom rules for entry, reader, relay, and lockdown events.
  - 1. Provide GUI for creating custom rules and workflows related to entry, reader, relay, and lockdown events.
  - 2. Advanced event category.
- P. Quick Start: Provide access control system that supports quick start configuration to automatically populate standard parameter fields in groups for new sites, readers, and controllers.
- Q. Encryption: Provide access control system that supports the following encryption methods:
  - 1. TLS 1.2+: Require TLS encryption between the access control system and Openpath controller.
  - 2. Private key: Require mobile credential to utilize a revolving NSA Suite B cryptographic algorithm, with the private key to be generated on the mobile device and never to be shared, only to use public key pairing.
- R. Dashboards: Monitor via real-time dashboards user activity, entry activity, and hardware states, including:
  - 1. Access control panel cloud and LAN connection status, hardware version, and software version.
  - 2. Credential reader connection status, hardware version, software version, and temperature.
  - 3. Video footage, live event feed, and occupancy.
  - 4. Badge verification, including badge photo, transaction time, and date.
  - 5. Unlock entries from the main dashboard, provided the entries are configured to support remote unlock.
  - 6. Identify hardware by activating the lights on the specified access control panel and indicator lights and buzzer on the specified credential reader for troubleshooting purposes.
  - 7. Create custom dashboards to monitor entry activity, cameras, occupancy, statistics, and lockdown plans.
- S. Reporting: Generate, filter, edit, and customize system reports that can be exported to CSV format. Support the following report types:
  - 1. Activity logs. Can be scheduled on a recurring basis.
  - 2. User activity.
  - 3. Entry activity.
  - 4. Visual activity.
  - 5. Entry access audit.
  - 6. User access audit.
  - 7. Portal audit report.
  - 8. Operator audit trail.
  - 9. Credential management.
  - 10. Alarm Management.
  - 11. Mustering.
  - 12. Offline wireless lock events are shown only in Activity logs, Alarms, Entry activity, and User activity reports, after performing a manual sync with the locks.

- T. Lockdown Plans: Define, trigger, and revert lockdown plans. Alert local authorities with video when a lockdown plan is triggered.
- U. Landlord/Tenant Support: Share zones with other organizations to support landlord/tenant scenarios.
- V. Hardware Configuration: Add access control panels, credential readers, credential enrollment readers for wireless locks, intercom readers, and wireless locks.
  - 1. View wireless lock gateways synced using the Allegion ENGAGE<sup>™</sup> app. Sync gateways and update firmware in the dashboard.Integrations: Support third-party integrations, including identity providers and other applications, natively as well as through custom configurations and Zapier. Create custom integrations with webhooks.
- W. Portal SSO: Support SSO, allowing Administrators to authenticate via identity providers including, but not limited to, Microsoft Azure Active Directory (OAuth2 and OAuth Client Service Principal authentication), Google G Suite, Okta (OAuth 2.0 authentication), and OneLogin integrations.
- X. Mobile App SSO: Support SSO, allowing users to authenticate their mobile credentials via Okta integration.
- Y. Partner Support: Partner Center provides overview of customer accounts, hardware, and software license requests. Manage accounts, access the store, and access marketing and training materials.
- Z. Video Intercom: Initiate and answer one-way video, two-way audio calls, remotely unlock entries from the voice assistant interface, and set up voicemail and call routing to users, groups, or units. Generate a QR code for directory lookup on mobile phones. Includes support for legacy SIP mode for VoIP calling.
  - 1. Building management: Create floors, units on a floor, and assign to users and groups.

### 2.5 CLOUD-BASED ACCESS CONTROL SOFTWARE INTEGRATIONS

- A. Subscription-based software licenses for integrators.
  - Identity Management and HR Systems.
  - a. Data sync every hour.
  - b. Data sync every 15 minutes.
  - 2. Workplace Communications.
  - 3. Event Monitoring Software.
  - 4. Visitor Management.
  - 5. Middleware.

1.

- 6. Video Management.
- 7. Printing Badges on Card Printers.
- 8. Tenant Experience.
- 9. Spatial Awareness.
- 10. Emergency Notification and Response.
- 11. Coworking / Flexible Workspace.
- 12. Building Management Systems.
- 13. Video Analytics.
- 14. Gym and Fitness.
- 15. Parking Solutions.
- 16. Schlage Wireless locks.

- 17. Video Integrations: Coordinate integration and unification requirements with section 28 05 45.
  - a. Avigilon Alta Aware: When activated for an organization within Alta Control Center, a unified user password is employed for seamless integration across both systems.
  - b. Camio.
  - c. Cisco Meraki.
  - d. Milestone.
  - e. Rhombus Systems.

## 2.6 CLOUD-BASED ACCESS CONTROL HARDWARE INTEGRATIONS

- A. Panel Hardware:
  - 1. Avigilon Access Control Core Controller.
  - 2. Avigilon Single Door Controller.
  - 3. Avigilon 4 Port Board.
  - 4. Avigilon 8 Port Board.
  - 5. Avigilon 16 I/O Elevator Board.
  - 6. Legacy hardware using passthrough.
- B. Supported Reader Hardware:
  - 1. Avigilon Standard Smart Reader.
  - 2. Avigilon Mullion Smart Reader.
  - 3. Avigilon Standard Smart Keypad Reader.
  - 4. Avigilon Mullion Smart Keypad Reader.
  - 5. Avigilon Embedded USB Smart Reader.
  - 6. Avigilon Video Reader Pro.
  - 7. Avigilon Video Intercom Reader Pro.
  - 8. Legacy Wiegand-based Readers using passthrough.
- C. Credential Technologies:
  - 1. Avigilon Alta (formerly Openpath) Mobile Credential.
  - 2. Avigilon Alta Cloud Key and Guest Pass.
  - 3. Avigilon Alta 13.56 MHz DESfire (EV1, EV2, and EV3) Credentials.
  - 4. Avigilon Alta 125 kHz LF Prox.
  - 5. Provide Openpath Custom DESFire Configuration Card to maintain backward compatibility of EV3-A DESFire cards and forward compatibility of EV3-B cards with readers.
  - 6. Schlage: All Physical (Mifare, Prox, DESFire).
  - 7. Farpointe Data: All Physical (Mifare, Prox).
  - 8. Other non-proprietary card formats (Mifare, Prox).
- D. Credential Enrollment Readers for programming Allegion Schlage keycards and fobs.
  - 1. Up to 11 entries are supported on each keycard or fob.
- E. Wireless Locksets:
  - 1. Allegion Schlage: NDEB, LEB, and Control<sup>™</sup> wireless locksets.
- F. Exit Devices:
  - 1. Von Duprin. RU & RM.
- G. Supported Camera Hardware:
  - 1. Avigilon Ava cameras connected through Alta Aware user account.

- H. Power Supplies: Provide one of the following power supplies that are manufacturer-prepared to support Avigilon hardware.
  - 1. LifeSafety Power: Enclosures, Kits, and Power Supplies.
  - 2. Backup battery (not included): 12VDC sealed lead acid (SLA) or gel cell batteries in series.
- I. Request-to-Exit Devices
  - a. Request To Exit (REX) Motion Sensors
    - 1) Provide REX motion sensors for detecting authorized exits through card reader controlled doors as indicated on the Security Device Drawings.
    - 2) Wire the REX motion sensor to the manufacturer's recommended input of the Data Gathering Panel or door controller. Also Rex shall be wired for 4-state Supervision and report circuit shorted, switch closed, switch open, open circuit.
    - 3) For doors equipped with electromagnetic locks, activation of the REX motion sensor shall release the electric locking mechanism and shall shunt the intrusion alarm output.
    - 4) For doors equipped with electric locking mechanisms that are free exiting at all times (e.g. mortise electric locks, electric strikes, etc.), the REX motion sensor shall only shunt the intrusion alarm output and shall not unlock the lock. Use of door control buttons and graphics shall not affect the request to exit motion sensor operation for doors with free egress hardware.
    - 5) REX motion sensors shall be labeled to meet local codes.
    - 6) REX Motion Sensor must be dual technology, and be line of sight adjustable.
    - 7) Refer to Division 8 construction documents, and security drawings for locations.
    - 8) Acceptable Manufacturers:
      - a) Bosch DS160
      - b) Tyco T.Rex-LT-NL
  - b. Request-to-Exit Pushbutton
    - 1) Provide a UL Listed request-to-exit (REX) pushbuttons as indicated on the Security Device Drawings for unlocking card reader controlled doors with electromagnetic locks, and as required.

- 2) Wire the REX pushbuttons to the REX input of the associated Data Gathering Panel or door controller. Activation of the REX pushbutton shall release the lock and shall shunt the door alarm.
- 3) The REX pushbutton shall contain an adjustable time delay relay for door unlock and shall be intrinsically fail-safe in order to release the door(s) in the event of a failure of the exit control circuitry within the Data Gathering Panel. It shall also be pneumatic, and require no additional power.
- 4) Refer to Division 8 construction documents, and security drawings for locations.
- 5) Acceptable Manufacturers:
  - a) Dortronics W5286-P23DAXE1
  - b) Or approved equal
- c. Electric Locking Mechanisms
  - 1) Refer to Division 8 construction Documents for required electric locking types. All door hardware is specified by Division 8.
  - 2) Electric locks to be provided and installed by division 8 contractor.
  - 3) Electrical Contractor to provide 120VAC power local, and Fire relay each door as indicated in the construction documents.
  - Security contractor to provide cabling and make final connections to electric locking mechanisms and power transfer devices provided by the hardware contractor as indicated on the Security Device Drawings.
  - 5) Provide fail-safe operation of electric locking mechanisms as required by local codes.
  - 6) Provide cabling from device to power supplies for all electric locking mechanisms. Fail-safe locking devices shall unlock automatically under the following conditions:
    - 7) Any building fire alarm
    - 8) Loss of building power
    - 9) Failure of the power supply
  - 7) Fail-secure locks shall remain operational during a fire alarm condition or power failure.
- d. Automatic openers

- 1) Refer to Division 8 construction documents for required locations, and types.
- 2) Electrical Contractor to provide 120VAC for all auto openers.
- 3) Auto openers to be provided and installed by division 8 contractor.
- 4) Security contractor to provide cabling and make final connections to the auto openers, and interface with the access control system as indicated on the Security Device Drawings.

# e. Power Supplies

- 1) Provide power supplies for all SMS equipment, Data Gathering Panels, as specified herein.
- 2) Provide independent, fused outputs for each device connected to the power supply.
- 3) For Locks, provide a multi-output access power controller with independent fused relay outputs and Fire Relay interface.
  - a) All power supplies to contain two 12AH batteries for backup.
- 4) Monitor power fail alarms for each location within the SMS.
  - a) All 12/24VDC Power Supplies must be UL listed.
- 5) All 120VAC for 12/24DVC power supplies must be wired directly in the enclosure in order to maintain UL listing. Refer to manufacturer's guidelines.
- 6) Refer to Division 8 construction documents for lock power requirements.
- 7) Acceptable Manufacturers:
  - a) Altronix
  - b) LifeSafety Power
- f. Magnetic contact (door position switches):
  - 1) Provide Double Pull Double Throw position switch to monitor the open/closed status of doors as indicated on the Security Device Drawings.
  - 2) Magnetic contact (door position switches): Provide normally closed door position switches to monitor the open/closed status

of doors and for camera callup whether the callup is for a door held open, door forced or the camera activation when a door is closed and the contact is made.

- 3) Acceptable Manufacturers:
  - a) GRI
  - b) Or approved equal
- g. Tamper Switches
  - 1) Provide normally closed tamper switches to monitor the secure status of all Security and power related enclosures
  - 2) Include the number of tamper switches in the total alarm input figures.
  - 3) Acceptable Manufacturers:
    - a) Bosch
    - b) Or approved Equal
- h. Fire Alarm System
  - 1) Electrical Contractor to Monitor normally closed fire alarm contacts from the Fire Alarm System.
  - Electrical Contractor to provide all required fire alarm relays at each Security head end location and as required by the division 8 construction documents and security drawings.
  - 3) Security Contractor to Interface with a normally closed contact from the Fire Alarm Relay to the door power supply. This is to provide for automatic unlocking of fail-safe locks during a fire alarm.
  - 4) Security Contractor to provide UL Listed Fire Alarm interface at each lock power location.
  - 5) Security Contractor to provide all cable and connections as required to interface the terminals with the SMS and fail-safe locks. The Fire Alarm System Contractor will provide cable and connections as required from the interface terminal cabinet to the Fire Alarm System.
- i. Data Gathering Panel Power Supply
  - The Data Gathering Panel power supply shall be dedicated to Data Gathering Panels and shall not provide power for locks or any other low voltage device.

j. Minimum Specifications:

1)	Туре	UL Listed Class II power limited
2)	Input	120 VAC hard wired
3)	Output	Regulated and filtered DC
4)	Alarm outputs	Individual low battery and power fail
5)	Battery backup	Four hours of rechargeable backup for the connected load
6)	Battery support	Battery charger to maintain battery
7)	Battery	Sealed gel type
8)	Enclosure	Key lockable wall mount housing with tamper switch

- k. The Data Gathering Panel Power Supply shall be housed in a locking steel enclosure designed for surface mounting. The housing shall include a tamper switch to sense the removal or opening of the enclosure cover. All Data Gathering Panel power supplies shall be keyed alike and shall be on the same key as all security system Data Gathering Panels, power supplies and power distribution cabinets.
- I. Acceptable Manufacturers: As per the SMS manufacturer's recommendations and/or specifications.
- m. Tamper Switch

4)

- 1) Minimum Specifications:
- 2) Type Plunger
- 3) Configuration Normally closed when the cabinet door is closed
  - Mounting Fastened within cabinet with no access to fasteners when cabinet is closed

- n. Request-To-Exit Motion Sensor. Provide request-to-exit motion sensors as indicated on the security drawings.
  - 1) Minimum Specifications:
  - 2) Detection technology Passive Infrared 3) Detection pattern Adjustable to provide coverage of immediate door area. 4) Output contact Normally open contact that closes momentarily (one second or less) when sensor is activated 5) Power requirements 12-24 VDC Surface mount to wall or ceiling or 6) Mounting integral to the latching hardware.
- o. Provide a manufacturer recommended power supply. The power supply shall be UL Class II, power limited.
- p. Concealed Magnetic Contact (Door Position Switch). Provide concealed magnetic contact switches as indicated on the security device drawings.
  - 1) Minimum Specifications:
  - 2) Gap 1/2 inch between the magnet and switch
  - 3) Configuration DPDT Contact, White in Color.
  - 4) Security Biased
  - 5) Mounting As recommended by the door position switch manufacturer

### 2.7 CONTROL DEVICES

- A. Single Door Controller:
  - 1. Basis of Design Product: Avigilon OP-CR-SDC Single Door Controller.
    - a. System Certifications:
    - b. CE 60529 certification mark for Europe.
    - c. IC certification mark for Canada.

- d. FCC Part 15 certification for The United States.
- e. NOM certification mark for Mexico.
- f. RCM certification mark for Australia and New Zealand.
- g. UKCA certification mark for the United Kingdom.
- h. ANATEL certification for Brazil.
- i. UL 294:
  - Attack Level I.
  - Endurance Level I.
  - Line Security Level I.
  - Standby Power Level I.
- 2. Unit Dimensions (LxWxD): 144.9 by 144.9 by 44.5 mm (5.71 by 5.71 by 1.75 in.).
- 3. Mounting: [Direct wall mount] [Single gang box] [Double gang box].
- 4. Capacity: Unit accommodates the following:
  - a. Up to 2 entries and 2 Avigilon Smart Readers.
  - b. Up to 2 Wiegand readers.
  - c. Up to 2 relays, 2A at 24VDC (resistive).
  - d. Communication Ports: 10/100 baseT Ethernet; 2 USB ports for readers.
- 5. Sensors:
  - a. 2 REX Sensors, nominal 5VDC, 1kohm to each input (resistors built into Controller).
  - b. Contact Sensors, nominal 5VDC, 1kohm to each input (resistors built into Controller).
- 6. Tamper Detection: Tamper sensor detects tamper events when front cover is removed.
- 7. Wi-Fi Enabled: Supports 2.4 GHz and 5 GHz connections.
- 8. Wiring: Standard RS-485 signaling to communicate with readers over standard wiring Includes removable contact terminal blocks for convenient wiring Physical switches to select relays to be dry or wet (12VDC or 24VDC).
- 9. Electrical Requirements:
  - a. Supply Requirements: PoE, PoE+, or external 12 to 24VDC.
    - When using an external supply, if 24VDC wet relay output is required a 24V external supply must be used.
  - b. External Supply Requirements: 12V at 2A minimum or 24V at 1A min.
  - c. Output Ratings:
    - Power Out can supply up to 100mA at 12V or 50mA at 24V.
    - 2 reader ports, max power output: 250mA at 12V each.
    - 2 relays, max power output:
    - PoE: Max 3W combined output (250mA at 12V, 125mA at 24V).
    - PoE+: Max 9W combined output (750mA at 12V, 375mA at 24V).
  - d. Battery Backup: May be added to PoE injector or optional external supply.
- B. Access Control Core:
  - 1. Basis of Design Product: Avigilon OP-CR-ACC Access Control Core.
  - 2. System Certifications:
    - a. CE 60529 certification mark for Europe.
    - b. IC certification mark for Canada.
    - c. FCC Part 15 certification for the United States.
    - d. RoHS certification for Europe.
    - e. UKCA certification mark for the United Kingdom.
    - f. ANATEL certification for Brazil.
    - g. RCM certification mark for Australia and New Zealand.

- 3. Unit Dimensions (LxWxD): 89.1 by 64.8 by 22 mm (3.51 by 2.55 by 0.87 in.).
- 4. Capacity: Unit accommodates the following:
  - a. Up to 8 entries: 2 Avigilon 4-Port Expansion Boards.
  - b. Up to 12 entries 1 Avigilon 4-Port Expansion Board and 1 Avigilon 8-Port Expansion Board.
  - c. Up to 16 entries 2 Avigilon 8-Port Expansion Boards.
  - d. Up to 8 entries: 1 HID (R) Mercury (TM) LP Series Intelligent Controller LP1501.
  - e. Up to 32 entries: 1 HID Mercury LP Series Intelligent Controller, LP1502 or LP2500.
- 5. Communication Ports 10/100/1000 baseT Ethernet 2 USB 2.0 ports and 2 USB 3.0 ports for expansion board connections.
- 6. Tamper Detection: Connects to tamper switch to detect opening of enclosure.
- 7. Alta Hardware: Mercury Security hardware.
- 8. Electrical Requirements:
  - a. Input Voltage: 12 to 24VDC, 0.4A at 12V, 0.2A at 24V.
  - b. Operating Voltage:12 to 24 VDC.
  - c. Operating Current:
    - 0.7A at 12VDC.
    - 0.4A at 24VDC.
  - d. Battery Backup: CR2032 3V, to be replaced every two years.
- C. 4-Door Smart Hub:
  - 1. Basis of Design Product: Avigilon SYS-4ENT-DVE1 12/24V 4-Door Core Series Smart Hub.
  - 2. System Certifications:
    - a. CE 60529 certification mark for Europe.
    - b. IC certification mark for Canada.
    - c. FCC Part 15 certification for the United States.
    - d. NOM certification mark for Mexico.
    - e. RoHS certification for Europe.
    - f. UKCA certification mark for the United Kingdom.
    - g. ANATEL certification for Brazil.
    - h. UL 294:
      - Attack Level I.
      - Endurance Level I.
      - Line Security Level I.
      - Standby Power Level I.
  - 3. Unit Dimensions (LxWxD): 308 by 355.6 by 119.9 mm (12.13 by 14 by 4.72 inches).
  - 4. Capacity: Unit accommodates the following:
    - a. Up to 4 Avigilon Smart Readers.
      - Standard RS-485 signaling to communicate with Avigilon readers over standard wiring.
    - b. Up to 4 door relays, 5A at 24VDC (resistive).
    - c. Auxiliary Relays: 2 auxiliary relays and 4 configurable auxiliary I/O pins provide extra inputs and outputs and allow additional sensors or Wiegand devices.
      d. Communication Ports: 10/100/1000 baseT Ethernet; USB port.
  - 5. REX and Contact Sensors: 4 REX and 4 contact sensor inputs with end-of-line monitoring, nominal 5VDC, 1kohm to each input.
  - 6. Wiring: RS-485 wiring to connect to the Avigilon Smart Readers. End-of-line monitoring with single or double termination on all REX, Contact, and Auxiliary inputs supported with user-installed 1k resistors.

- 7. Electrical Requirements:
  - a. Input Voltage: 120VAC, 208/230VAC with cuttable jumper.
  - b. Output Voltage: 12VDC and 24VDC.
  - c. Operating Current:
    - 2.2A at 12V with 4 Avigilon Smart Readers.
    - 1.2A at 24V with 4 Avigilon Smart Readers.
  - d. Locking Hardware Operating Current: 12V-only system: 1.8A.
    - 24V-only system: 1.8A.
  - e. Power Supply: LifeSafety Power® E1 enclosure pre-installed with 24V FPV4 power supply, C4 relay-based lock control module, and B100 secondary voltage module.
  - f. Functions: 24V, 3A 1.7A at 24VDC or 3A at 12VDC available for locking hardware.
  - g. Battery Backup: Accommodates two 12VDC sealed lead acid (SLA) or gel cell batteries in series (not included).
- D. 8-Door Smart Hub:

i.

- 1. Basis of Design Product: Avigilon SYS-8ENT-DVE2 12/24V 8-Door Smart Hub E2 Enclosure.
- 2. System Certifications:
  - a. CE 60529 certification mark for Europe.
  - b. IC certification mark for Canada.
  - c. FCC Part 15 certification for the United States.
  - d. NOM certification mark for Mexico.
  - e. RCM Certification mark for Australia and New Zealand.
  - f. RoHS certification for Europe.
  - g. UKCA certification mark for the United Kingdom.
  - h. UL 294:
    - Attack Level I.
      - Endurance Level I.
      - Line Security Level I.
      - Standby Power Level I.
        - CAN/ULC 60839-11-1.
- 3. Unit Dimensions (LxWxD): 406.4 by 508 by 119.9 mm (16 by 20 by 4.72 in).
- 4. Capacity: Unit accommodates the following:
  - a. Door Relays: 8 relays, 5A at 24VDC (resistive).
  - b. Avigilon Readers: Up to 8 Avigilon Smart Readers.

Uses industry standard RS-485 signaling to communicate with Avigilon readers over standard wiring.

- c. Auxiliary Relays: 4 relays, 1A at 24VDC, 4 auxiliary relays, and 4 configurable auxiliary I/O pins provide extra inputs and outputs and allow additional sensors or Wiegand devices.
- d. Door Relays: 8 relays, 5A at 24VDC (resistive).
- e. Communication Ports 10/100/1000 baseT Ethernet; USB port.
- f. REX and Contact Sensors 8 REX and 8 contact sensor inputs with EOL monitoring, nominal 5VDC, 1kohm to each input.
- g. Auxiliary I/O: 4 input/output lines with EOL monitoring.
- 5. Wiring: RS-485 wiring to connect to the Avigilon Smart Readers. EOL monitoring with single or double termination on all REX, Contact, and Auxiliary inputs supported with user-installed 1k resistors.

- 6. Electrical Requirements:
  - a. Input Voltage: 120VAC, 208/230VAC with cuttable jumper.
  - b. Input Current: 3.7 Amp maximum.
  - c. Output Voltage: 12VDC and 24VDC.
  - d. Operating Voltage:12 to 24 VDC.
  - e. Operating Current:
    - 3.3A at 12VDC with 8 Avigilon Smart Readers.
    - 1.7A at 24VDC with 8 Avigilon Smart Readers.
    - g. Locking Hardware Operating Current: 12V-only system: 2.7A.
      - 24V-only system: 4.3A.
  - h. Power Supply: LifeSafety Power® E2 enclosure pre-installed with 24V FPV6 Power Supply, C8 Relay Based Lock Control Module, and B100 Secondary Voltage Module. Up to 2A at 12V and 3A at 24V available for locking hardware.
  - i. Battery Backup: Accommodates two 12VDC sealed lead acid (SLA) or gel cell batteries in series (not included).
- E. 8-Door Large Smart Hub:

f.

- 1. Basis of Design Product: Avigilon SYS-8ENT-DVE4 12/24V 8-Door Large Smart Hub, E4 Enclosure.
- 2. System Certifications:
  - a. CE 60529 certification mark for Europe.
  - b. IC certification mark for Canada.
  - c. FCC Part 15 certification for the United States.
  - d. NOM certification mark for Mexico.
  - e. RoHS certification for Europe.
  - f. UKCA certification mark for the United Kingdom.
  - g. UL 294.
    - Attack Level I.
    - Endurance Level I.
    - Line Security Level I.
    - Standby Power Level I.
  - h. CAN/ULC 60839-11-1.
- 3. Unit Dimensions (LxWxD): 508 by 609.6 by 170.7 mm (20 by 24 by 6.72 in).
- 4. Capacity: Unit accommodates the following:
  - a. Door Relays: 8 relays, 5A at 24VDC (resistive).
  - b. Avigilon Readers: Up to 8 Avigilon Smart Readers.
    - Uses industry standard RS-485 signaling to communicate with Avigilon readers over standard wiring.
  - c. Auxiliary Relays: 4 relays, 1A at 24VDC 4 auxiliary relays and 4 configurable auxiliary I/O pins provide extra inputs and outputs, and allow more sensors or Wiegand devices.
  - d. Communication Ports 10/100/1000 baseT Ethernet; USB port.
  - e. REX and Contact Sensors 8 REX and 8 contact sensor inputs with EOL monitoring, nominal 5VDC, 1kohm to each input.
- 5. Wiring: RS-485 wiring to connect to the Avigilon Smart Readers. EOL monitoring with single or double termination on all REX, Contact, and Auxiliary inputs supported with user-installed 1k resistors.
- 6. Electrical Requirements:
  - a. Input Voltage: 120/230 VAC 50/60 Hz.
  - b. Operating Voltage: 12 to 24 VDC.
  - c. Operating Current:

- 3.3A at 12VDC with 8 Avigilon Smart Readers.
- 1.7A at 24VDC with 8 Avigilon Smart Readers.
- d. Locking Hardware Operating Current:
  - 12V-only system: 8.7A.
  - 24V-only system: 4.3A.
- e. Power Supply: LifeSafety Power® E4 enclosure pre-installed with 24V FP0150 Power Supply, B100 Secondary Power Module, C8 Lock Control Module, and D8P Power Distribution Module.
- f. Battery Backup: Accommodates two 12VDC sealed lead acid (SLA) or gel cell batteries in series (not included).
- F. 16-Door Large Smart Hub:
  - 1. Basis of Design Product: Avigilon SYS-16ENT-DVE6 12/24V 16-Door Large Smart Hub, E6 Enclosure.
  - 2. System Certifications:
    - a. CE 60529 certification mark for Europe.
    - b. IC certification mark for Canada.
    - c. FCC Part 15 certification for the United States.
    - d. NOM certification mark for Mexico.
    - e. RCM certification mark for Australia and New Zealand.
    - f. RoHS certification for Europe.
    - g. UKCA certification mark for the United Kingdom.
    - h. UL 294.
      - Attack Level I.
      - Endurance Level I.
      - Line Security Level I.
      - Standby Power Level I.
    - i. CAN/ULC 60839-11-1.
  - 3. Unit Dimensions (LxWxD): 584.2 by 762 by 170.7 mm (23 by 30 by 6.72 inches).
  - 4. Capacity: Unit accommodates the following:
    - a. Door Relays: 16 relays, 5A at 24VDC (resistive).
    - b. Avigilon Readers: Up to 16 Avigilon Smart Readers.
      - Uses industry standard RS-485 signaling to communicate with Avigilon readers over standard wiring.
    - c. Auxiliary Relays: 8 relays, 1A at 24VDC. 8 auxiliary relays and 8 configurable auxiliary I/O pins provide extra inputs and outputs, and allow more sensors or Wiegand devices.
    - d. Communication Ports 10/100/1000 baseT Ethernet; USB port.
    - e. REX and Contact Sensors 16 REX and 16 contact sensor inputs with EOL monitoring, nominal 5VDC, 1kohm to each input.
  - 5. Wiring: RS-485 wiring to connect to the Avigilon Smart Readers. EOL monitoring with single or double termination on all REX, Contact, and Auxiliary inputs supported with user-installed 1k resistors.
  - 6. Electrical Requirements:
    - a. Input Voltage: 120/230 VAC 50/60 Hz.
    - b. Operating Voltage:12 to 24 VDC.
    - c. Operating Current:
      - 5.9A at 12VDC with 16 Avigilon Smart Readers.

3.2A at 24VDC with 16 Avigilon Smart Readers.

- d. Locking Hardware Operating Current:
  - 12V-only system: 26A.
  - 24V-only system: 12.8A.

- e. Power Supply: LifeSafety Power® E6 enclosure pre-installed with 24V FP0250 Power Supply, 12V or 24V FP0150 Power Supply, two C8 Lock Control Modules, and two D8P Power Distribution Modules.
- f. Battery Backup:
  - For 24V supply, use two 12VDC sealed lead acid (SLA) or gel cell batteries in series (not included).
    - For 12V supply, use one 12VDC SLA battery (not included).

## 2.8 ACCESS CONTROL EXPANSION BOARDS

- A. 4-Port Expansion Board:
  - 1. Basis of Design: Avigilon OP-EX-4E 4-Port Expansion Board.
  - 2. System Certifications:
    - a. CE 60529 certification mark for Europe.
    - b. IC certification mark for Canada.
    - c. FCC Part 15 certification for the United States.
    - d. RCM certification mark for Australia and New Zealand.
    - e. UKCA certification mark for the United Kingdom.
    - f. UL 294.
  - 3. Unit Dimensions (Device Only) (LxW): 120 by 125 mm (4.72 by 4.92 in.)
  - 4. Capacity: Unit accommodates the following:
    - a. Readers: Up to 4 Avigilon Readers
    - b. Relays: Up to 4 relays, 5A at 24VDC (resistive)
    - c. Auxiliary Relays: 2 relays, 1A at 24VDC.
    - d. REX and Contact Sensors: 4 REX and 4 contact sensor inputs: nominal 5VDC, 1 kohm to each input.
    - e. Auxiliary Inputs: 4 input lines with EOL monitoring.
  - 5. Interface Ports: USB port, Expansion port.
  - 6. Wiring: Industry standard RS-485 signaling to communicate with Avigilon readers over CAT 5/6 wiring.
  - 7. Electrical Requirements:
    - a. Operating Voltage:12 to 24 VDC.
    - b. Operating Current: 0.5A at 12VDC; 0.3A at 24VDC.
    - c. Battery Backup: One or two 12VDC sealed lead acid (SLA) or gel cell batteries (not included) based on power supply and system requirements.
- B. 8-Port Expansion Board:
  - 1. Basis of Design: Avigilon OP-EX-8E 8-Port Expansion Board.
  - 2. System Certifications:
    - a. CE 60529 certification mark for Europe.
    - b. IC certification mark for Canada.
    - c. FCC Part 15 certification for the United States.
    - d. RCM certification mark for Australia and New Zealand.
    - e. UKCA certification mark for the United Kingdom.
    - f. UL 294.
      - Attack Level I.
      - Endurance Level I.
      - Line Security Level I.
      - Standby Power Level I.
  - 3. Unit Dimensions (LxW): (120 by 206 mm (4.72 by 8.11 in.)
  - 4. Capacity: Unit accommodates the following:
    - a. Readers: Up to 8 Avigilon Readers.

- b. Relays: Up to 8 door relays, 5A at 24VDC (resistive).
- c. Auxiliary Relays: 4 relays, 1A at 24VDC.
- d. REX and Contact Sensors: 8 REX and 8 contact sensor inputs with EOL monitoring, nominal 5VDC, 1kohm to each input.
- e. Auxiliary Inputs: 4 input lines with EOL monitoring.
- 5. Interface Ports: USB port, Expansion port.
- 6. Wiring: Industry standard RS-485 signaling to communicate with Avigilon readers over CAT 5/6 wiring.
- 7. Electrical Requirements:
  - a. Operating Voltage:12 to 24 VDC.
    - Operating Current:
      - 0.6A at 12VDC.
        - 0.3A at 24VDC.
  - c. Battery Backup: One or two 12VDC sealed lead acid (SLA) or gel cell batteries (not included) based on power supply and system requirements.
- C. 16-Capacity Elevator Board:

b.

- 1. Basis of Design: Avigilon OP-16EM 16 I/O Elevator Board.
- 2. Certifications:
  - a. CE 60529 certification mark for Europe.
  - b. IC certification mark for Canada.
  - c. FCC Part 15 certification for the United States.
  - d. UL 294.
    - Attack Level I.
    - Endurance Level I.
    - Line Security Level I.
    - Standby Power Level I.
- 3. Unit Dimensions (LxW): 133 by 90 mm (5.25 by 3.55 in.)
- 4. Capacity: Unit accommodates the following:
  - a. Readers: Up to 2 Avigilon Readers.
  - b. Relays: Up to 16 relays, 60VDC Max:
    - 24VDC, 1A (resistive).
      - 125VAC, 0.5A (resistive).
  - c. General Purpose Inputs: 16, 3V-24VDC.
- 5. Interface Ports: USB port, Expansion port.
- 6. Wiring: Industry standard RS-485 signaling to communicate with Avigilon Readers over traditional Wiegand wiring.
- 7. Electrical Requirements:
  - a. Operating Voltage: 12 to 24VDC.
  - b. Operating Current:
    - 12V: 825mA Max (with 2 Avigilon Readers).
    - 12V: 325mA Max (with no readers).
    - 24V: 470mA Max (with 2 Avigilon Readers).
    - 24V: 190mA Max (with no readers).
  - c. Battery Backup: NA.
- D. Access Control Hardware Integrations:
  - 1. Supported Panel Hardware: Coordinate integration requirements with Section 28 13 00.
    - a. Mercury Controllers: Series 3 (LP1501, LP1502, LP2500).
    - b. Mercury Sub Panels: Series 3 (MR50-S3(B), MR52-S3(B), MR16IN, MR16OUT).

### 2.9 CLOUD-BASED ACCESS CONTROL MOBILE APPLICATIONS

- A. Encryption: Support mobile credentials via a mobile app with end-to-end encryption to administrative portal.
- B. Mobile app shall run in the background on a device with minimal battery usage.
- C. Devices Supported: Mobile devices with Android and IOS operating systems, including Apple Watch.
- D. Mobile app security:
  - 1. Mobile credentials shall be assigned individually or as part of an identity provider integration.
  - 2. Mobile credential to utilize a revolving NSA Suite B cryptographic algorithm, with the private key to be generated on the mobile device and never to be shared, only to use public key pairing.
  - 3. All communication for access control to use TLS1.2+ encryption.
  - 4. Mobile credential authentication shall use triple communication pathway: From mobile credential to reader over BLE, to panel over LAN Wi-Fi, to cloud and panel over Wi-Fi and LTE.
  - 5. Mobile credentials to be authenticated via Bluetooth, NFC, and/or geoproximity.
  - Functions Supported:
  - 1. Touch entry.

Ε.

- 2. Wave to unlock.
- 3. In-app unlock.
- 4. Auto proximity unlock
- 5. Remote unlock.
- 6. Last-to-leave locking, allowing users to lock an entrance regardless of schedule.
- 7. 24-hour activity log.
- 8. Send emails to the site's help contact for troubleshooting when users are unable to access an entry.
- 9. Share guest access link.
- 10. Mobile credentials shall support custom virtual identification badges.
- 11. Call, email, and send audit logs to technical support from the mobile credential.
- 12. Trigger and revert lockdown plans from the mobile credential.
- 13. Detect nearby readers based on RSSI strength.
- 14. Reprovision mobile credential on a new or different device.
- 15. Touchless elevator access control.
- 16. Search for entries on list view.
- 17. Favorite entries list.
- 18. Adjustable Bluetooth range and geolocation detection per door.
- 19. Two-factor authentication.
- 20. Unlock requests while mobile app is in background and mobile device is turned on, but not unlocked.
- 21. Admin app: Provision wireless locks, download audit logs, user management, and update access.
- 22. Third-party Allegion ENGAGE mobile app: Commission Schlage enrollment reader and wireless locks into ENGAGE site, and view real-time battery status.
- 23. Supports video in Avigilon Video Reader Pro

- 24. Supports video, call routing, and intercom calling in Avigilon Video Intercom Reader Pro
- F. Logging into the mobile app:
  - 1. Support passwordless login.
  - 2. Support logging in with a password.
  - 3. Support Okta SSO.

#### 2.10 SMART READERS

- A. Basis of Design Product: Avigilon OP-R2X-STND Standard Smart Reader v2, and as follows:
  - 1. Physical Characteristics:
    - a. Dimensions:
    - b. With back cover, no gang box: 74 x 120 x 23 mm (2.9 x 4.7 x 0.9 in).
    - c. No back cover, on gang box: 74 x 120 x 11 mm (2.9 x 4.7 x 0.43 in).
    - d. Front Cover Color: Black.
    - e. Mounting: [Flush mounted in gang box] [Surface-mounted] [Surface-mounted with casing and snap cover exposed.
    - f. Frequency: LF (125 kHz),HF (13.56 MHz), BLE (2.4 GHz).
  - 2. LED indicators:
    - a. Locked/unlocked status.
    - b. Identification status.
    - c. Offline.
    - d. Configuration.
    - e. Insufficient power.
    - f. Crossed wires.
  - 3. Certifications:
    - a. CE certification mark for the European Union.
    - b. FCC Part 15 certification for the United States.
    - c. IC certification mark for Canada.
    - d. NOM certification mark for Mexico.
    - e. UKCA certification mark for the United Kingdom.
    - f. BIS certification mark for India.
    - g. RCM certification mark for Australia and New Zealand.
    - h. ANATEL certification mark for Brazil.
    - i. RoHS certification for Europe.
  - 4. Regulatory Compliances:
    - a. IEC 60529 Environmental Rating: IP65.
    - b. ISO 14443A.
    - c. UL 294.
      - Attack Level I.
        - Endurance Level I.
      - Line Security Level I.
      - Standby Power Level I.
    - d. CAN/ULC 60839-11-1.
    - e. UL 62368-1.
    - f. UL 60950-22.
  - 5. Features:
    - a. Supports auxiliary Wiegand readers connected through the Avigilon reader
    - b. Functions with the Avigilon Alta Open mobile app on both Android and iOS.
    - c. Supports PIN functionality.

- d. Supports two-factor authentication (2FA) & multi-factor authentication (MFA).
- e. RS-485 Access control panel connection: 12-inch (305 mm) wiring harness.
- 6. Functions:
  - a. Wave to unlock.
  - b. Auto proximity unlock.
- 7. Compatibility/Interoperability:
  - a. System Compatibilities:
    - Avigilon Alta Access System including Avigilon controllers, cloud management software, and the Avigilon Alta Open mobile
      - app and mobile SDK.
      - Legacy access control systems via Mobile Gateway option.
      - 3rd party Wiegand accessories.
  - b. Card Compatibilities:
    - Avigilon DESFire® EV3-A and EV3-B Smart Card.
    - Avigilon DESFire EV3-B Key Fob.
    - Avigilon Proximity Card and Avigilon Proximity Fob.
    - HID® Proximity.
    - LenelProx®.
- 8. Power Ratings:
  - a. 0.25A at 12VDC.
  - b. 0.12A at 24VDC.
- 9. Security Requirements:
  - a. Fully encrypted communication between mobile app and controller.
  - b. Fully encrypted communication between key cards and reader.
  - c. Tamper resistant secure storage.
  - d. Fully encrypted PIN transmission between reader and controller.
- Special Installation Requirements: Use shielded CAT6A cable with recommended maximum cable length of 300ft (91m) with CAT6 or 500ft (152 m) if two wire pairs are used for GND and VIN (power). Review the wiring information chart for additional wiring instructions.
- B. Basis of Design Product: Avigilon OP-R2X-MULL Mullion Smart Reader v2, and as follows:
  - 1. Physical Characteristics:
    - a. Dimensions: 43 x 119 x 22 mm (1.7 x 4.7 x 0.86 in).
    - b. Color: Black.
    - c. Mounting: Surface.
    - d. Frequency: LF (125 kHz), HF (13.56 MHz), BLE (2.4 GHz).
  - 2. LED indicators:
    - a. Locked/unlocked status.
    - b. Identification status.
    - c. Offline.
    - d. Configuration.
    - e. Insufficient power.
    - f. Crossed wires.
  - 3. Certifications:
    - a. CE certification mark for the European Union.
    - b. FCC Part 15 certification for the United States.
    - c. IC certification mark for Canada.
    - d. NOM certification mark for Mexico.
    - e. UKCA certification mark for the United Kingdom.
    - f. BIS certification mark for India.
    - g. RCM certification mark for Australia and New Zealand.

- h. ANATEL certification mark for Brazil.
- i. RoHS certification for Europe.
- 4. Regulatory Compliances:
  - a. IEC 60529 Environmental Rating: IP65.
  - b. ISO 14443A.
  - c. UL 294.
    - Attack Level I.
    - Endurance Level I.
    - Line Security Level I.
    - Standby Power Level I.
  - d. CAN/UL 60839-11-1.
  - e. UL 62368-1.
  - f. UL 60950-22.
- 5. Features:
  - a. Supports auxiliary Wiegand readers connected through the Avigilon reader.
  - b. Functions with the Avigilon mobile app on both Android and iOS.
  - c. Supports PIN functionality.
  - d. Supports two-factor authentication (2FA) & multi-factor authentication (MFA).
  - e. RS-485 Access control panel connection: 12-inch (305 mm) wiring harness.
- 6. Functions:
  - a. Wave to unlock.
  - b. Auto proximity unlock.
- 7. Compatibility/Interoperability:
  - a. System Compatibilities:
    - Avigilon Alta Access System including Avigilon controllers, cloud management software, and the Avigilon Alta Open mobile app and mobile SDK.
      - Legacy access control systems via Mobile Gateway option.
    - 3rd party Wiegand accessories.
  - b. Card Compatibilities:
    - Avigilon DESFire® EV3-A and EV3-B Smart Card.
    - Avigilon DESFire EV3-B Key Fob.
    - Avigilon Proximity Card and Avigilon Proximity Fob.
    - HID® Proximity.
    - LenelProx®.
- 8. Power Ratings:
  - a. 0.25Å at 12VDC.
  - b. 0.12A at 24VDC.
- 9. Security Requirements:
  - a. Fully encrypted communication between mobile app and controller.
  - b. Fully encrypted communication between key cards and reader.
  - c. Tamper resistant secure storage.
  - d. Fully encrypted PIN transmission between reader and controller.
- 10. Special Installation Requirements: Use shielded CAT6A cable with recommended maximum cable length of 300ft (91m) with CAT6 or 500ft (152 m) if two wire pairs are used for GND and VIN (power). Review the wiring information chart for additional wiring instructions.
- 2.11 VIDEO READERS (FRONT ENTRANCE ONLY)
  - A. Basis of Design Product: Avigilon OP-VID-PRO-INT Avigilon Video Intercom Reader Pro:
     1. Physical Characteristics:

- a. Dimensions: 47 x 155.5 x 31.9 mm (1.85 x 6.12 x 1.26 in).
- b. Color: Black.
- c. Mounting: [Surface with cradle bracket] [Surface with mounting plate] [Recessed with US gang box].
- d. Frequency: LF (125 kHz), HF (13.56 MHz), BLE (2.4 GHz).
- 2. LED indicators:
  - a. Power On/Off.
  - b. User access granted/denied
  - c. Entry door locked/unlocked status.
  - d. Identification status.
  - e. Offline.
  - f. Configuration.
- 3. Certifications:
  - a. CE certification mark for the European Union.
  - b. FCC Part 15 certification for the United States.
  - c. IC certification mark for Canada.
  - d. NOM certification mark for Mexico.
  - e. UKCA certification mark for the United Kingdom.
  - f. BIS certification mark for India.
  - g. RCM certification mark for Australia and New Zealand.
  - h. ANATEL certification mark for Brazil.
  - i. RoHS certification for Europe.
- 4. Regulatory Compliances:
  - a. IEC 60529 Environmental Rating: IP65.
  - b. ISO 14443A.
  - c. UL 294.
    - Attack Level I.
    - Endurance Level I.
    - Line Security Level I.
    - Standby Power Level I.
    - CAN/UL 60839-11-1.
  - e. UL 62368-1.
  - f. UL 60950-22.
- 5. Functions:

d.

- a. Wave to unlock.
- 6. Features:
  - a. Built-in camera records entry activity
  - b. Supports Avigilon's Triple Unlock technology.
  - c. Can connect to third-party legacy access control panel.
  - d. Indoor/outdoor design.
  - e. Capable for reading and forwarding QR codes to third-party systems.
  - f. RS-485 Access control panel connection: 12-inch (305mm) wiring harness.
- 7. Audio Features:
  - a. Audio Speaker: One 2W speaker.
  - b. Microphone: Two (2) onboard microphones.
  - c. Noise Cancelation: Manufacturers standard.
  - d. Audio Encoding: G.711u, G.711a, G.726.
- 8. Intercom Features:
  - a. Call Routing:
    - Direct Connect: Visitors call users by stating their name.

Front Desk Connect: Visitors call a group of users designated as the front desk.

- Unit Connect: Visitors call one or more users by stating the unit or apartment.
- Visual Voicemail: Visitors may leave a voicemail to be seen by a site administrator.
- b. Virtual Directory: Print QR codes for visitors to access a directory on their mobile phone.
- c. Motion Detection: Detects activity and starts recording.
- d. SIP Mode: SIP-enabled and voice over IP calling on legacy systems.
- e. Languages for Voice Assistant Interaction:
  - English (US). Spanish (ES). Spanish (MX). French (FR). Italian (IT). German (DE). Polish (PL).
- 9. System Performance:
  - a. Image Sensor: 1/2.5 inch 5MP CMOS.
  - b. Resolution: 5MP (2592 x 1944) recording at 25 fps.
  - c. Video Compression: H.264, MJPEG.
  - d. Bit Rate: CBR, VBR, MBR.
  - e. Focal Length: 2.8mm (F1.6).
  - f. Field of View:
    - Horizontal: 109 degrees. Vertical: 81 degrees.
    - Diagonal: 136 degrees.
  - g. Minimum Illumination:
    - Color mode: 2.5 lux.
    - Monochrome mode: 0.0 lux (IR on).
  - h. IR Range: 9 m (29.53 ft).
  - i. Wide Dynamic Range: HDR (87dB).
  - j. Operating Temperature:
    - -40C to 50C (-40F to 122F).
    - Cold start -25C (-13F).
  - k. Operating Humidity: Up to 90% relative humidity, non-condensing.
  - I. Power Ratings:
    - Input Voltage: 802.3af PoE (48VDC).
      - Power Consumption: 7.8W.
  - m. Video Storage Capacity:
    - Edge storage: 10GB eMMC (network failover recording).
    - Cloud storage: 30, 60, 90, 180 plans available.
- 10. Compatibility/Interoperability:
  - a. System Compatibilities:
    - Avigilon Access System including Avigilon controllers, cloud management software, and mobile app.
      - Legacy access control systems via Mobile Gateway option and Standalone Mode.
      - Third-party VMS software via open video standards.
      - Supports auxiliary Wiegand readers connected through the Avigilon reader.

Functions with the Avigilon Alta Open mobile app on both Android and

iOS. Supports PIN functionality.

Supports two-factor authentication & multi-factor authentication.

b. Card Compatibilities:

Avigilon DESFire® EV3-A and EV3-B Smart Card.

Avigilon DESFire EV3-B Key Fob.

Avigilon Proximity Card and Avigilon Proximity Fob.

- HID® Proximity.
- LenelProx®.
- 11. Security Requirements:
  - a. Fully encrypted communication between mobile app and controller.
  - b. Fully encrypted communication between key cards and reader.
  - c. Tamper resistant secure storage.
  - d. Fully encrypted PIN transmission between reader and controller.
- 12. Special Installation Requirements: Use shielded CAT6A cable with recommended maximum cable length of 300ft (91 m) with CAT6 or 500ft (152 m) if two wire pairs are used for GND and VIN (power). Review the wiring information chart for additional wiring instructions.

## 2.12 INTRUSION DETECTION SYSTEM

- A. BASE PANEL
  - 1. The security control panel shall have a base capacity of 16 fully supervised and programmable zones with integral power supply and supervised battery charger, auxiliary power for powering security detection devices, program switched auxiliary power supply for 4-wire smoke detectors, integral supervised digital alarm communicator, two general purpose program controllable outputs which can be programmed as general-purpose outputs or as Addressable loops and a supervised bell/siren output. One 12Amp hour battery is required for backup power for each panel.
- B. PANEL ZONE EXPANSION
  - 1. The panel shall be expandable to a maximum of 128 zones by adding standard hardwired 8 and/or 16 zone modules connected to the base panel via a supervised four-wire power/communication bus, by adding up to 112 addressable detection devices to one or both addressable loops on the base panel or by adding 64 zone 433 MHz. Narrow Band wireless receivers (to expand coverage area, up to 8 receivers shall be supported) to the four-wire communication bus. The system shall be capable of expansion using hardwired, addressable and wireless simultaneously in any mix that suits the application. The system shall support hardwired seismic sensors and programmable scheduled testing of these seismic sensors.

### C. SYSTEM KEYPADS

1. The system shall accommodate up to 16 LCD keypads which are powered from the base panel via the four-wire communications bus. LCD keypads shall have a

display capacity of at least 32 alphanumeric characters with the display having brightness and contrast control. Control keys shall be backlit for low light level ease of use. The keypads shall include individual "Armed", "Ready" and "Trouble" indicators and five programmable 'function' buttons and three keypad activated alarm buttons. Keypads shall have the capability to operate in a power-save mode in the event of a power failure.

### D. ALTERNATE REPORTING METHODS

1. The system shall be capable of reporting all alarms, trouble and system status information over various combinations of the single integral digital alarm communicator, the dual digital alarm communicators, a cellular transmitter, an internet (IP) communicator and over a dedicated line DVAC channel.

## E. CENTRAL STATION REPORTING

- 1. The system shall provide high speed 20 bps 1400/2300 Hz. handshake, contact ID and SIA reporting formats and shall be capable of being programmed to call up to 3 telephone numbers. The system shall also allow communication to a pager. The telephone numbers shall be programmable for 'backup' dialing should the primary number fail. The system shall be programmable for split reporting such that alarms/restorals, openings/closing and miscellaneous events can be sent to different telephone numbers or communication paths.
- 2. The system shall report an account code for each partition and a separate account code for non-partition (system) events.
- 3. The system shall provide opening/closing scheduled suppression to prevent opens and closes from being reported to the central station.

### F. HARD COPY PRINTOUT

- 1. The system shall be capable of including a serial output for a hard copy printer. All system events, alarms and restorals shall be printed and each event shall include the date and time.
- G. OUTPUT RELAYS
  - 1. The system shall be capable of including up to 64 fully programmable output relays with each relay having form 'C' contacts rated 2 Amps at 30 VDC. Relays shall be added in increments of four and may be located anywhere on the communication bus. Relay modules shall include an integral power supply, supervised battery charger and supply up to 1.0 Amp of auxiliary power at 12 VDC.

# H. LOW POWER OUTPUTS

1. The system shall be capable of including up to 144 low power outputs with each output able to source 50 mA at 12 VDC. Outputs shall be added in increments of 16 and may be added anywhere on the communications bus.

## I. REMOTE ANNUNCIATION

- 1. The system shall be capable of remote zone alarm and system status annunciation, up to 144 points, by adding 32 and/or 64 point annunciators anywhere on the 4-wire communications bus. Annunciators shall be capable of being flush mounted. The annunciators shall provide bull's eye and graphic annunciation capability.
- 2. The dual access control module shall accept a variety of proximity readers, magnetic stripe readers and any 26-bit Wiegand reader and readers shall be capable of being located up to 500 feet from the module. The dual module shall have inputs for two 'request-to-exit' detectors, two 'postpone arm' pushbuttons, two 'arm' pushbuttons, two 'door' contacts and two outputs for door strikes.
- 3. Access control software shall be an integral component of the base panel software and shall provide the following functions: capacity for 1,500 cards and up to 64 access levels, 99 seven-day schedules with 4 intervals per schedule, holiday scheduling for a two-year period, individual door unlock schedules, a programmable option to require 2 cards to open a specific door, ability to unlock doors automatically on fire alarm and automatic daylight saving time adjust. Access control functions shall be fully programmable through any system keypad and either locally or remotely using any PC and the upload/download software.
- 4. All access control transactions shall be recorded in the systems 3,000 event buffer for viewing via the keypad, for printing on a local printer or viewing locally or remotely via the upload/download software.
- J. VOICE ASSISTED STATUS AND CONTROL
  - 1. The system shall be capable of adding a module to provide system status and control via any local or remote touch-tone telephone with the system providing system status information by voice. The system shall include a word library and allow custom words for zone labels.
- K. AUTOMATION CONTROL
  - 1. The system shall be capable of controlling by event and/or by schedule up to 32 control devices. The automation control module shall connect to the system via the 4-wire communications bus. The system shall include
  - 2. 16 schedules to control the automation devices. Automation shall be controllable via any keypad and local or remote touch-tone telephone.

### L. SYSTEM SOFTWARE

- 1. The base panel shall come complete with all the software to implement every system feature and allow the addition of every expansion or functional module without changes or addition to the basic software.
- M. SYSTEM PROGRAMMING

- 1. The system shall be fully programmable via the LCD keypads and shall also allow event buffer viewing via the keypads.
- 2. Separate PC based Upload/Download software shall provide the ability to fully program the system and read all current system programming and the event buffer. The system shall provide a connector on the base panel to allow local upload/download operation and shall be capable of being remotely, over the telephone lines or internet (IP network), uploaded or downloaded. The system shall provide a separate telephone number that can be called for the remote upload/download operation. Remote upload/download access shall be controllable by the user to prevent unauthorized access.
- 3. All system programming shall be maintained in non-volatile memory such that program information is maintained even if all AC and battery power is removed.

## N. USER CODES

1. The system shall provide for 1,500 user codes selectable as either 4 or 6 digits. For Access Control, user codes shall be assignable to 1 of 64 access levels. User codes shall assignable to one or multiple partitions. The system shall offer a programmable option to allow users to program their own access code. The system shall offer a programmable option to require 2 users to disarm certain partitions.

## O. PARTITIONS

1. The system shall be programmable for up to 8 fully independent partitions each partition shall have its own account code. Keypads shall be assignable as 'partition' keypads or 'global' keypads. Each zone in the system shall be assignable to one or more partitions.

### P. SCHEDULING

1. The system shall provide for 99 date schedules with 4 intervals per schedule, 4 holiday schedules with 2 years of scheduling capacity, 50 open/close suppression schedules and 16 automation schedules. All schedules shall be programmable via the LCD keypads and via downloading either locally or remotely.

### Q. GROUND FAULT DETECTION

1. For commercial fire installations, the system shall include an integral ground fault detector which shall detect a single ground fault on any extended conductor in the system.

### R. SUPERVISION

1. Each zone in the system shall be supervised. General system supervision shall include; loss of AC for the base panel and any remote functional. Provide 4 state supervision for all intrusion devices. The panel with its own AC input, batteries for the base panel and all remote functional panels shall be supervised and short circuit protected, each addressable device and each wireless input

device shall be supervised for it presence and the 4-wire communication bus shall be supervised for low voltage and the presence of each enrolled module and keypad. Digital alarm communicators shall be supervised for telephone line trouble and failure to communicate and the system shall report any cellular or IP network communication panel trouble.

- S. FALSE ALARM PREVENTION
  - 1. The system shall include the following false alarm prevention features: audible exit delay, arm/disarm bell squawk, audible exit fault, urgency on entry delay, no entry arming/disarming, swinger shutdown programmable by zone, transmission delay by zone, AC fail, TLM trouble and low battery trouble transmission delay, rotating keypress buffer, recent close code transmission, police code (cross zone) transmission, scheduled seismic sensor testing and opening after alarm transmission.

### T. AUTOMATIC ARMING/DISARMING

1. The system shall allow for automatic arming and disarming partition(s) according to a programmable schedule. The system shall include a method to automatically arm a partition after it has been disarmed for a set period of time. The system shall include a programmable limitation for basic users which shall delay disarming a specific partition for a set period of time.

## U. TEMPORARY ZONE DISABLING/BYPASSING

1. The system shall include the following temporary zone disabling/bypassing features: arm partition with zone violated and arm zone upon restore, manual zone bypass by user, temporary bypass of a programmable group of zones which shall re-activate zones after programmable time.

### V. NETWORK COMMUNICATIONS

1. The system shall be capable of network (LAW/WAN) and Internet communications according to ULC Level5 and/or UL-AA (Highline Security) standards. The Network communicator shall utilize 128-bit AES encryption over 10/100 base-T networks and support static or dynamic IP addressing. The IP communicator shall be capable of sending alarm events to a primary and backup IP receiver address and up to two standard email addresses. The internet communicator shall perform full alarm reporting directly to the central monitoring station as well as performing full system configuration programming and viewing system status using remote upload/download software over encrypted connection. For security purposes, the internet communicator shall be capable of end-to-end supervision and hardwire substitution detection.

### W. DUAL TECHNOLOGY MOTION SENSORS

 The dual technology sensor shall use both microwave and PIR as detection methods. Sensor shall have a detection range of a minimum of 40ft. Unit shall be either wall or ceiling mountable. Current draw shall be 17 milliamps at 12VDC. Unit shall be no large than 5in x 2.76in x 2in in size or in ceiling mounted no larger than 3.5in in diameter. Unit shall be wired with 4 state line supervision.

- X. GLASS BREAK DETECTORS
  - 1. Glass break sensor shall be an acoustic type sensor that had a minimum detection diameter of 50ft. The detector shall have pattern recognition technology that listens for actual patterns of glass breaking and eliminating the false alarms patterns. Alarm response must be a minimum of 4 seconds. The unit shall be a maximum of 4 inches in diameter or 4.6 inches x 2.75 inches x 1 inch. Current draw must not exceed 25 milliamps.
- Y. Acceptable Manufacturers:
  - 1. Honeywell VISTA 128

## 2.13 WIRE AND CABLE

- A. Minimum Specifications:
  - 1. All wire and cable shall be Underwriter's Laboratories (UL) approved for its intended application, shall meet all national, state and local code requirements for its application, and shall meet or exceed manufacturers' recommendations for the components connected.
  - 2. Provide plenum-rated cable as required by code.
  - 3. All wire and cable shall meet individual system or subsystem manufacturer specifications.
  - 4. All insulated wire and cable shall conform to the minimum requirements of Insulated Cable Engineers Association (ICEA) Standards.
  - 5. Wire and cable shall comply with the applicable requirements of the National Electrical Code (NEC), latest edition, in regards to cable construction and usage.
  - 6. The conductors of wires shall be copper, and have conductivity in accordance with the standardization rules of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The conductor and each strand shall be round and free of kinks and defects.
  - 7. Insulation shall be rated for a minimum of 300 V.
  - 8. Color coding shall be accomplished by using solidly colored insulation. Grounding conductors, where insulated, shall be colored solid green or identified with green color as required by the National Electric Code (NEC).
  - 9. All category cabling (Category 6A) shall be in strict accordance with the division 27 specification, and be provided for by the telecommunications contractor.
  - 10. The structure cabling system for the integrated security system must be manufacturer certifiable.
- B. Minimum Wire Types and Sizes

- 1. Low Voltage Power Cable: Wire size shall be a minimum of 18 AWG, twisted, stranded, insulated and jacketed.
- 2. Control Point Cable (Non-Power): Wire size shall be a minimum of 20 AWG, twisted, stranded, insulated and jacketed.
- 3. Control Point Cable (Low Voltage Power): Wire size shall be a minimum of 18 AWG, stranded, insulated, and jacketed.
- 4. For all IP devices provide category 6 UTP plenum cable as detailed in the 27000 UTP specification.

### PART 3 EXECUTION

## 3.1 GENERAL

- A. The requirements of Part One and Part Two also apply to the execution of the work.
- B. When a Manufacturer, or authorized Representative accepts an order for material and equipment, they agree to adjust Submittals and production schedules as required to accommodate the project schedule. Schedules shall be included with Submittals indicating review times as specified herein and manufacturing and delivery times such that material and equipment will be manufactured and delivered to the site sufficiently ahead of schedule so as not to delay the completion of the work.
- C. Prior to bid, inspect the site, existing conditions, fully understand the Work required, and provide the Work according to Contract Documents and all existing site conditions. Confer with the Manufacturer's of existing systems to be retained, modified or extended. Include all required costs and components for a fully functional system performing as indicated herein and on the Drawings. No additional compensation will be granted because of existing conditions.
- D. Verify the exact location prior to bid of all items that may be indicated and determine exact location of all electrical items that are not indicated on the Drawings.
- E. Any work installed contrary to the Contract Documents or written directions from the Architect shall be subject to change as directed by the Architect and no extra compensation will be allowed for making these changes or any work of any other trade due to these changes.
- F. Upon completion of work, the security contractor shall submit a testing and commissioning report for engineer/architect/owner approval. This document shall be in a excel spreadsheet format.
- G. Upon approval from the engineer/architect/owner of the testing and commissioning report shall commence the warranty period.
- H. Equipment and systems shall not be installed without first coordinating the location and installation of equipment and systems with all other Trades.

- I. Any and all material installed or work performed in violation of above requirements shall be readjusted and corrected by the Installer without charge.
- J. Refer to all Drawings associated with the project, prior to the installation or roughing-in of outlets, conduit and equipment, to determine the exact location of all outlets.
- K. Assure that all equipment is accessible, such as junction boxes, pull boxes, controls and such other apparatus as may require maintenance and operation from time to time. Security contractor to coordinate with electrical provided construction access panels sized in order to provide adequate and required access for installation. Provide rated panel or door appropriate for the construction being installed into (fire, smoke and/or acoustical).
- L. After installation, equipment shall be protected to prevent damage during the construction period. Openings in conduits and boxes shall be closed to prevent the entrance of foreign materials.
- M. Home runs indicated are not to be combined or reduced without written consent from the engineer.
- N. All connections to equipment shall be made as required, and in accordance with the approved submittal, setting drawings, and manufacturer's guidelines.
- O. Site Observation:
  - Site observation visits will be performed randomly during the project by the engineer. Reports will be generated noting observations. Deficiencies noted on the site visit reports shall be corrected. All work shall comply with the Contract Documents, applicable Codes, regulations and local Authorities whether or not a particular deficiency has been noted in a site visit report.
  - 2. The general contractor or construction manager is responsible to notify the engineer ten working days prior to closing in work behind walls, raised access floors, ceilings, etc., so that installed work can be observed prior to being concealed.
  - 3. Work concealed prior to observation and correction of deficiencies shall be made accessible for review at the discretion of the engineer. Bear all costs for allowing work to be reviewed.
  - 4. Areas shall stay accessible until deficiencies are corrected and accepted. Notify the Engineer when all deficiencies are corrected. Return reports with items indicated as corrected prior to re-observation by the engineer.

### 3.2 SITE INSPECTION

A. Security contractor to continuously verify that the site conditions are in agreement with the Contract Documents and the design package. Submit a report to the Engineer documenting changes to the site or conditions that affect the performance of the system to be installed. For those changes or conditions, which affect system installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency. No deficiency shall be corrected without written permission from the Engineer.

P. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Security Device Drawings. Coordinate all aspects of the Work with the engineer/architect/construction manager.

# 3.3 INSTALLATION

- A. Coordination
  - 1. Security contractor to coordinate with the GC/electrical contractor to ensure that adequate conduit is provided and that equipment backboxes are adequate for system installation.
  - 2. Security contractor to coordinate with the Electrical contractor to ensure that adequate power has been provided and properly located for the security system equipment, and door hardware.
  - 3. Security contractor to coordinate with the general contractor/construction manager to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.
  - 4. Security contractor to coordinate with the door hardware contractor to ensure that the appropriate architectural/security door hardware is installed.
  - 5. Security contractor to coordinate locations of all devices with the general contractor/construction manager and architect prior to installation.
  - 6. Security contractor to coordinate and verify the location of each piece of rack-mounted equipment with the engineer and owner's IT.
  - 7. Security contractor to coordinate custom SMS report requirements with the Owner. Submit report formats to the Owner for review and acceptance.
  - 8. Security contractor to coordinate all access rights, time zones, lockdown, cardholder group and other SMS programming parameters with the owner.
  - 9. Security contractor to coordinate all initial database partitioning and setup with the Owner prior to initial programming and card holder data entry.
  - 10. Security contractor to coordinate camera housing and mount finishes with the architect/owner prior to installation.
  - 11. Security contractor to coordinate finishes and colors of all equipment with the architect/owner. Submit all finish and graphics for all equipment in public areas to the Engineer for approval prior to installation.
  - 12. Security contractor to coordinate all requirement penetrations both interior and exterior with architect and construction manager.
  - 13. Security contractor to coordinate all fire stopping with construction manager/architect as require by code.

- 14. Security contractor to coordinate with owner's IT for all network based requirements. This shall include but not be limited to IP address, DHCP server requirements, cyber security requirements, and network traffic management requirements.
- 15. Security contractor to coordinate all requirement of the turnstiles with the architect, engineer, and construction manager.
- 16. Installation methods must be in strict accordance with ANSI/BICSI 005-2016, owner's standards, and manufacturer's guidelines.
- 17. Mounting heights for all device must comply with ADA standards.
- 18. Security contractor shall be in compliance with the NEC, IBC, and other local codes that are required by the AHJ.
- B. General
  - 1. Security contractor to verify acceptance of each type of specified request-to-exit hardware for each application with local life safety code officials.
  - 2. Security contractor to verify fail-safe and fail-secure lock requirements with the architect and engineer.
  - 3. Contractor or equipment manufacturer logos or names shall not be visible on equipment in public areas.
  - 4. Security contractor to provide tamper proof fasteners for all equipment in public areas. Fastener finish shall match equipment finish.
- C. Conduit shall be used in all garage areas, and exposed areas. Contractor's conduit design layout shall be coordinated and approved by architect, engineer, and construction manager. All conduits shall have no more than a 40% fill at the end of the project.
- D. If approval by architect/engineer, hanger assemblies located the garage areas and areas exposed to the weather, including; anchors, clamps, threaded rod, nuts, washers and pipe hanger shall be provided with a factory applied hot dipped galvanized coating. Any components or assemblies that require field modification, cutting, welding, or removal of the applied hot dipped galvanized coating shall be repainted with the appropriate coating.
- E. Equipment: Installation requirements are as follows:
  - 1. Data Gathering Panel Locations
    - a. Security contractor to provide the following:
      - 1) Configure security equipment as indicated in the Security Device Drawings.
      - 2) Wire all power supply power fail alarm contacts in each equipment room as a single alarm input to the SMS.

- 3) Wire each power supply low battery alarm contact as individual alarm inputs to the SMS.
- 2. Data Gathering Panels
  - a. Security contractor to provide the following:
    - 1) Configure the system such that devices can be connected to spare input points, output points and card reader inputs on the Data Gathering Panel without requiring reconfiguration of the SMS.
    - 2) Configure the Data Gathering Panel IP communication chains such that no more than 16 Doors (including all possible spare card readers) shall be connected to each Data Gathering Panel IP chain. RS-232 and RS-485 chains without direct connection to an IP network is not permitted.

### 3. Card Readers

- a. Security contractor to provide the following:
  - Wire card reader LEDs to indicate valid and invalid card reads, and door locked and unlocked conditions. All card reader LED indicators shall operate identically.
- 4. Electric Locking Mechanisms
  - a. Security contractor to provide the following:
    - 1) Provide connection to electric locking mechanisms provided by the hardware contractor.
    - 2) Wire electric locking mechanism as indicated on the Security Device Drawings.
    - 3) Wire fail-safe electric locking mechanisms in accordance with local codes.
    - 4) Wire fail-secure electric locking mechanisms and power supplies such that locks remain powered and operational during a fire alarm condition or building power failure.
- 5. Fire Alarm Interface
  - a. Security contractor to provide the following:
    - 1) Connect (hard wire) fail-safe electric and time delay locking mechanisms to the building fire alarm system for fail-safe release upon any fire alarm.
    - Interface with a single low voltage/low current normally closed dry contact from the fire alarm system provided by the fire alarm contractor in the Fire Command Center (FCC). The contact will open on any fire alarm condition.

- 3) Provide all additional UL listed fail-safe relays and power supplies necessary to interface to this contact and unlock all fail-safe doors.
- 4) Connect fail-safe relays and UL listed power supplies to standard building power. Connection of fail-safe devices to emergency or UPS power shall not be acceptable.
- 5) Reference the Security Device Drawings for fire alarm interface requirements.
- F. System Programming and Data Entry
  - 1. Security contractor to provide all initial system programming and setup of the SMS including, but not limited to the following:
    - Graphical maps and icons. Coordinate with the Engineer to obtain AutoCAD Owner/Architectural backgrounds for implementation as graphical maps.
       Import all AutoCAD background information provided by the Engineer and produce a complete set of graphical maps depicting all SMS points.
    - b. SMS card reader information. Coordinate all card reader values and text, including descriptors, alarm messages, Camera call up, map call up and identification with the Owner and Engineer.
    - c. Input and output points for the SMS. Coordinate all input and output priorities and text, including descriptors, alarm messages, camera call up, and map call up and identification with the Owner and Engineer.
    - d. Initial system Card Reader information. Coordinate all Card Reader values and text, including descriptors, alarm messages, camera call up, map call up and identification, with the Owner.
    - e. Input and output points for the SMS. Coordinate all point priority and point text, including descriptors, alarm messages, camera call up, map call up and identification, with the Owner.
    - f. Initial camera call up and alarm information for interface with Video Management System.
    - g. Initial camera call up and alarm information for interface with Intercom System. Coordinate all inputs and outputs for the intercom system with the SMS for seamless action through the master station.
  - 2. Security contractor to provide all initial system programming and setup of the Security Management System including, but not limited to the following:
    - a. Initial setup for the interface with the SMS. The interface shall provide for automatic video surveillance Camera selection upon alarms within the SMS as defined in the Specification. Coordinate automatic video surveillance Camera

selection, real-time record initialization, and record status alarm annunciation requirements with the Owner prior to programming.

- b. On-screen alphanumeric identification of each VIDEO SURVEILLANCE Camera, on each Monitor. Coordinate descriptors with the Owner prior to programming.
- c. Automatic selection of a VIDEO SURVEILLANCE Camera adjacent to a Card Reader upon an invalid card use. Coordinate automatic camera selection requirements with the Owner prior to system programming.
- d. Programming triggers for the video surveillance analytical references.

# 3.4 WIRING TECHNIQUES

- A. Security contractor or construction manager to provide code compliant fire proofing techniques for all penetrations of fire rated partitions and slabs, where the penetrations are made by or used for installation of the Security System.
- B. Route all wire and cable as required to prevent interference and signal contamination of both security system cable and cable associated with other systems. Coordinate the routing of wire and cable requiring isolation from power, radio frequency (RF), telephone, etc. with the Owner.
- C. Separate 120 VAC and other line voltage cables from low voltage cables within enclosures.
- D. Wire nuts shall not be an acceptable means of connecting wire and cable. Use B-wire crimp connectors or equal.
- E. Splicing of cable is not acceptable. All cabling shall be home run back to its designated closet.
- F. Run all wire and cable continuous from device location to the final point of termination. No mid-run cable splices will be allowed unless approved by the Engineer.
- G. Securely fasten junction boxes to the building structure.
- H. Secure junction box covers with tamperproof screws
- I. Provide compression type fittings to secure cable at junction box openings.
- J. Make cable connection for device terminations in junction boxes with crimp type connectors. Connectors shall provide a hermetic seal and test probe access such that the circuit may be checked without breaking the connection.
- K. Ensure all that back boxes and junction boxes have the approved an UL listed cover.
- L. All RJ45 male connectors shall be UL listed.
- M. All security cabling shall be done in strict accordance with ANSI/BICSI 005-2016, Electronic Safety, and Security System Design, and Implementation.
- N. Component Connections

- 1. Prepare wire ends for attachment to components in accordance with manufacturer recommendations.
- 2. Wherever possible, and unless otherwise recommended by the manufacturer, connect individual wire conductors with crimp type spade lugs.
- O. Grounding
  - 1. Establish an earth ground connection within each Data Gathering Panel location. The intent of the earth ground is to prevent ground loops within security system circuits, ensure proper communications between system components and devices, and isolate security equipment from building electrical system noise.
  - 2. Connect all security equipment located at each Data Gathering Panel location to the earth ground connection at each location.
  - 3. Under no conditions shall the AC neutral, either in a power panel or in receptacle outlets, be used for a reference ground.
  - 4. Provide all necessary hardware and cable to properly ground security equipment.
  - 5. Ground all equipment according to the manufacturer recommendations for each piece of equipment. The Contractor shall be responsible for any damage to equipment or communications problems that may occur due to improper grounding.
- P. Testing
  - 1. Test all cabling for continuity before connection to data gathering panels, cameras etc.

### 3.5 POWER REQUIREMENTS

- A. Emergency backup 120 VAC power will be dedicated for the Security System as indicated on the Electrical Device Drawings. Coordinate with the Engineer to establish locations of security dedicated 120 VAC circuits.
- B. Connect to the AC power and provide UL listed power supplies and transformers to distribute low voltage power to the system components as required.
- C. Provide hinged cover terminal cabinets with tamper switches that are lockable for all power supplies, transformers and power distribution terminal strips. Provide all conduit and wiring from the AC power facilities to the terminal cabinets.
- D. All power supplies are to be installed in accordance with manufacturer's guidelines in an effort to maintain its UL listing.
- E. Surge Protection
  - 1. Provide protection against spikes, surges, noise, and other line problems for all system equipment and components.

2. Protect all exterior and building-to-building video, control, power, signal cables and conductors against power surges. Video surge protectors shall not attenuate or reduce video and sync signals under normal conditions. Each surge protector shall be UL Listed.

#### 3.6 LABELED DOORS AND FRAMES

- A. In no instance shall any UL labeled door or frame be drilled, cut, penetrated, or modified in any way.
- B. The Contractor shall be responsible for replacing any labeled door or frame that is modified without written approval from the Engineer.

### 3.7 LABELING

- A. Place wire identification numbers on each end of all conductors by using sleeve type, heat shrinkable markers. Wire markers shall be T&B Shrink-Kon Type HVM or equivalent. Install markers to be readable from left to right or top to bottom. Wire numbers shall be computer printed. Hand written labels shall not be acceptable.
- B. Mark all connectors with common designations for mating connectors. The connector designations shall be indicated on the record drawings.
- C. Permanently mark all terminals. Terminal and cable markings shall agree with markings shown on as-built drawing.
- D. Coil all spare conductors in the device backbox or panel wire way. Neatly bundle and tag conductors.
- E. All labeling shall be done in strict accordance with ANSI/TIA-606-B standard for labeling.
  - a. Return competence evaluations for each trainee directly to the Owner.
- F. Telephone Support
  - 1. The SMS manufacturers shall establish direct telephone support for the Owner during normal business hours.
  - 2. The Contractor shall provide on call service during the warranty period to answer any questions the Owner's representatives might have.
  - 3. The contractor shall provide 5 days of in service support to the owner. The technician shall be required to be on site during normal working hours, 8 a.m. to 5 p.m. and be available for after hours call back for service related events.

#### 3.8 SYSTEM START-UP

A. The Security System shall be complete and ready to operate prior to the Consultant's final acceptance of the system.

- G. Load all of the initial user database as defined in this Section into all programmable systems up to the inaugural day of beneficial use of the system. The Owner will assist in establishing procedural guidelines and in defining terminology and conditions unique to the Owner's operation.
- H. Label all controls as necessary to agree with their function.

# 3.9 SYSTEM ACCEPTANCE

- A. Final acceptance testing of the Work will be conducted by the manufacturer's certified rep.
- B. Prior to any final acceptance testing, the Security Contractor shall submit two sets of preliminary (draft) Record Drawings to the Engineer. The preliminary Record Drawings are to be used by the Engineer to conduct the system final test.
- C. Submit a paragraph by paragraph completion matrix indicating completion or delinquency for each item included in the Specification and all subsequent addenda and bulletins as part of the Work. Indicate completion of the requirement by the word "Completed" following each paragraph number. Indicate delinquency for the requirement by the words "To Be Completed" following the applicable paragraph number. Should work on any item be under way, but not yet fully complete, indicate the extent (or lack thereof) of completion to date, and the proposed date of completion.
- D. Conduct a complete test of the entire Security System and provide the Engineer with a written report on the results of that test. During the course of this test, calibrate and test all equipment, place the integrated Security System in service, and test the integrated system.
- E. Following completion of the initial testing and correction of any noted deficiencies, conduct a five day burn-in test. The intent of such test shall be to prove the Security System by placing it in near real operating conditions. During this period the Security System shall be fully functional and programmed such that all points, interfaces, controls, reports, messages, prompts, etc. can be exercised and validated. Record and correct any system anomaly, deficiency, or failure noted during this period. Scheduling of the final acceptance test shall be based on a review of the results of this burn-in test.
- F. Deliver a report describing the results of functional tests, burn-in tests, diagnostics, calibrations, corrections, and repairs including written certification to the Engineer that the installed complete Security System has been calibrated, tested, and is fully functional as specified herein.
- G. Prior to the final acceptance test, coordinate with the Engineer for security related construction clean-up and patch work requirements. Security equipment closets and similar areas should be free of accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, remove all waste materials, rubbish, the Contractor's and its subcontractors' tools, construction equipment, machinery and all surplus materials.
- H. Upon written notification from the Contractor that the Security System is completely installed, integrated and operational, training of owner's staff, and the burn-in testing completed, the Engineer will conduct a final acceptance test of the entire system.
- I. During the course of the final acceptance test by the Engineer, the Contractor shall be responsible for demonstrating that, without exception, the completed and integrated system

complies with the contract requirements. ALL PHYSICAL AND FUNCTIONAL REQUIREMENTS OF THE PROJECT SHALL BE DEMONSTRATED AND SHOWN. This demonstration will begin by comparing "as built" conditions of the Security System to requirements outlined in the Specification, item by item. Following the Specification compliance review, all Security System head-end equipment will be evaluated.

- J. In order to sufficiently demonstrate the Security System's functionality, the console operator on duty and his/her superior will be requested to perform certain daily operations inherent to the Security System. These operations may include, but not be limited to, manually locking and unlocking of doors within the SMS, verifying the status of current alarm/control points within the SMS, responding to alarms, adding/deleting personnel from the card holder database, camera call-up on various monitors, manipulation of PTZ cameras, changing setting on various pieces of equipment As all of these operations depend heavily on the training outlined within the Specification, the Contractor shall have completed all of the required training prior to initiation of the final acceptance test.
- K. Demonstrate the functionality of the various interfaces between systems. This will include, but not be limited to, correct camera call-up on certain alarms within the SMS, generation of alarms from related systems failure (e.g. video loss detection alarms loss of communications, etc.), fire alarm system fail safe lock release, and interface to any externally controlled devices and/or database system(s).
- L. Following the Security System equipment and workstation review, the installation of all field devices will be inspected. This field inspection will weigh heavily on the general neatness and quality of installations, complete functionality of each individual device, and mounting, backbox and conduit requirements compliance.
- M. All equipment shall be on and fully operational during any and all testing procedures. Provide all personnel, equipment, and supplies necessary to perform all site testing. Provide a minimum of two employees familiar with the system for the final acceptance test. One employee shall be responsible for monitoring and verifying alarms while the other will be required to demonstrate the function of each device. Supply at least two two-way radios for use during the test. A manufacturer's representative may be present on site to answer any questions that may be beyond the technical capability of the Contractor's employees, if the Contractor so elects or by specific request of the Engineer or Owner, at no charge to the Engineer or Owner.
- N. Upon successful completion of the final acceptance test (or subsequent punch list retest) the Engineer will issue a letter of final acceptance.
- O. The Engineer retains the right to suspend and/or terminate testing at any time when the system fails to perform as specified. In the event that it becomes necessary to suspend the test, all of the Engineer's fees and expenses related to the suspended test will be deducted from the Contractor's retainage. Furthermore, in the event it becomes necessary to suspend the test, the Contractor shall work diligently to complete/repair all outstanding items to the condition specified in the Specification and as indicated on the Security Device Drawings. The Contractor shall supply the Engineer with a detailed completion schedule outlining phase by phase completion dates and a tentative date for a subsequent punch list retest. During the final acceptance test, no adjustments, repairs or modifications to the system will be conducted without the permission of the Engineer.

END OF SECTION

# SECTION 315000 – EARTHWORK FOR SMALL PROJECTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 DESCRIPTION OF WORK:

- A. Strip soil as herein specified or indicated.
- B. Stockpile surplus topsoil, if any, on site where directed.
- C. Excavation for foundations, rough grading, utility services and extensions. Excavation of all trades is included herein.
- D. Provide additional material hereinafter specified or needed for fill. Remove from site excess material and that which is unsuitable for fill material and legally dispose of it.
- E. Backfilling (including all trades).
- F. Compact fill, as hereinafter specified.
- G. Repair any major deformations caused by the removal of large boulders, cave-ins, etc., with concrete, compacted bank run gravel or crushed stone.
- H. Protection and Precautionary Measurements:
  - 1. Carefully maintain benchmarks, monuments and other reference points. If disturbed or destroyed, replace as directed.
  - 2. Protect active pipes, if encountered, and notify the person owning same. If encountered, remove inactive utilities from within building lines. Plug or cap as indicated or directed.
  - 3. Protect people and property from damage and discomfort caused by dust. Water as necessary to quell dust.
- I. Erosion Control:
  - 1. Employ satisfactory methods and operations to minimize erosion of soil during earthwork operations. Follow accepted standards of the R.I.D.O.T. for erosion control.

### 1.3 RELATED WORK UNDER OTHER SECTIONS:

- A. Spreading and/or providing new topsoil Section 329200 Plantings
- 1.4 ELEVATION AND OBSTRUCTIONS:

- A. The Contract is based upon the following: that the surface elevations, utilities and physical features are as indicated, and the contractor shall be responsible to verify its accuracy both underground and overhead. There will be no extra payment for additional work required due to conflicts with the survey information whether shown or not shown.
- B. Ground water levels indicated are those existing at the time subsurface investigations were made and do not necessarily represent permanent ground water levels. It is the Contractor's responsibility to determine seasonable variations in the ground water levels which may affect the work. There will be no extra payment for any class of rock excavation.

### 1.5 QUALITY ASSURANCE:

- A. Materials, methods and compaction tests will be subject to approval of an approved inspection agency specified in Section 014000.
- B. Code and Standards: Perform excavation work in compliance with applicable requirement of governing authorities having jurisdiction.

### 1.6 REQUIREMENTS:

- A. One gradation curve and moisture-density curve for each type of material specified or proposed for use for approval (AASHTO T-27 and AASHTO T-180).
- B. A minimum of two in-place density tests for each lift of material placed or two for each 200 cubic yards of material placed, whichever results in the greatest number of tests (AASHTO T-191, T-205 or T-310 In-Place Density Testing by Nuclear Methods).
  - 1. Topsoil Analysis documenting pH and organic content of on-site material and material to be hauled in.
  - 2. Material delivered to the project shall be tested for compliance with the approved gradation, one test shall be made for each 750 cubic yards of material delivered.
- C. Prior to production and delivery to the site the Contractor shall, together with a representative of the Testing Laboratory chosen by the Owner, obtain at the source two representative 50 lb. samples of all materials proposed for use. Samples shall be placed in lined containers so as to prevent any loss of material during transportation. One sample will be analyzed by the Testing Laboratory for conformance with this specification, should the material be rejected a second at the source sampling shall be made. Upon approval of the material, the second sample taken at the source and not used for analysis shall be delivered by the Testing Laboratory to the Owner's representative at the site for his use. Each sample taken shall be clearly marked as follows:
  - 1. Project Name
  - 2. Architect's Name
  - 3. Contractor's Name
  - 4. Supplier's Name and Source
  - 5. Date Sample Taken
  - 6. Name of Sampler
  - 7. Intended Use and Specification Reference
- D. Test results shall be approved before delivery of any material to the site. Any change in source of materials or quality will require a new series of tests at no additional expense to the Owner.

E. All unsatisfactory work and any settlement within one (1) year of final acceptance shall be removed, replaced and retested at the Contractor's expense.

# 1.7 MISCELLANEOUS REQUIREMENTS:

- A. Traffic: Conduct operations and the removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities.
  - 1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  - 2. Provide all traffic control required and pay all costs incurred.
- B. Damages: Promptly repair damage caused to adjacent facilities by operations, as directed and at no additional cost.

# PART 2 - PRODUCTS

NOT APPLICABLE.

# PART 3 - EXECUTION

# 3.1 EXCAVATIONS:

- A. Topsoil Removal:
  - 1. Before starting to excavate, strip available topsoil, subsoil and unsuitable material from areas to be covered by improvements and where cuts or fills are required.
  - 2. Topsoil is defined as friable clay from surface soil found in a depth of not less than 4". Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2" in diameter, and without weeds, roots, and other objectionable material.
    - a. pH 5.5 to 7.6 Organic content 5% minimum, 20% maximum.
  - 3. Verify the depth of topsoil within contract limits. If additional topsoil is needed to fulfill topsoil spread requirements, the contractor shall provide topsoil from off-site sources as part of this contract, at his expense.
  - 4. Strip topsoil to whatever depths encountered, unless shown otherwise, and in such manner so as to prevent intermingling with the underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
  - 5. Remove unsuitable materials and legally dispose of it off site.
  - 6. Stockpile topsoil in storage piles in areas shown, or where otherwise indicated. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent windblown dust. Topsoil remains property of Owner.
- B. General Open Earth Excavation:

- 1. Excavate as necessary for work shown or specified. Remove earth, rocks, boulders, and other obstructions as herein defined.
- 2. Allow ample space for form work.
- 3. Leave bearing surfaces undisturbed, level and true. Excavate to solid bearing at elevations no higher than those shown.
- C. General Trench Earth Excavation:
  - 1. Excavate trenches for pipelines along straight lines.
  - 2. Keep trench width at top of pipe to the minimum needed for proper workmanship in installing pipe and making joints.
  - 3. Excavate the bottom of the trenches in earth and rock to the dimensions and depths indicated below the bottom of all pipes, to provide for gravel bedding beneath the pipes.
  - 4. Whenever wet or otherwise unsuitable soil (that which is incapable of properly supporting pipe as determined by the Architect) is encountered in the bottom of the trench, remove such soil to the depth required. Following the removal of such material, backfill the trench and satisfactorily compact to the proper grade with approved granular backfill.
  - 5. Form under bell ends to allow for jointing and to give the pipe a uniform bearing along the barrel only.
- D. Rock Excavation:
  - 1. Remove all rock to the levels indicated below, or as directed.
  - 2. There will be no extra payment for all classifications of rock removal.
  - 3. Rock is defined as boulders; stone or hard shale in original ledge; concrete footings, foundations, etc.; and other obstructions, in excess of one cubic yard, which cannot be broken and removed from site by normal job equipment (power shovels, 1-1/2 cubic yard capacity scoops, or bulldozers).
  - 4. Level off or shelve rock surfaces to a slope not exceeding one (1) vertical to twelve (12) horizontal, or as directed; before placing masonry or concrete on it.
- E. Extent of Rock Removal:
  - 1. For structures or portions thereof: one foot outside the base of walls or footing.
  - 2. For pipe trenches: twelve (12) inches outside bell of pipe up to 24" in diameter; and eighteen (18) inches outside bell of pipe over 24" in diameter in a vertical plane and twelve (12) inches below the outside of the pipe barrel.
  - 3. Lawn and shrub areas: eighteen (18) inches below finish grade.
- F. Unauthorized Excavation:
  - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect.

- a. Under footings, foundation bases or retaining walls, fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom without altering the required top elevation. Lean concrete fill may be used to bring elevations to proper position, only when acceptable.
- b. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed.
- c. Do all corrective work as specified above at no expense to the Owner.
- G. Stability of Excavations:
  - 1. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated.
  - 2. Maintain sides and slopes of excavations in asafe condition until completion of backfilling.
- H. Shoring and Bracing:
  - 1. Brace and shore sides of excavation as necessary to prevent danger to persons or damage to structures, injurious caving or erosion.
  - 2. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and crossbraces, in good serviceable condition.
  - 3. Provide shoring and bracing to comply with local codes and authorities having jurisdiction.
  - 4. Maintain shoring and bracing in excavation regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
    - a. Repair slides and cave-ins should they occur.
    - b. Remove the shoring and bracing before backfilling.
    - c. In removing shoring and bracing, exercise care to prevent voids. Immediately fill voids, if formed, with approved fill material.
- I. Water and Frost:
  - 1. Keep earth under footings and slabs dry and free from frost.
  - 2. Should bearing surfaces be softened by water or frost, re-excavate to solid bearing and fill with concrete or gravel as directed at no expense to Owner.

### 3.2 FILLING:

- A. General:
  - 1. Remove debris and organic matter before filling.
  - 2. Use approved materials only for fills.
  - 3. Obtain Architect's approval before filling.

- 4. Make fills as soon as feasible thereafter to ensure maximum settlement.
- 5. Do not place fill on frozen ground.
- 6. Provide all material free from frost, roots and other vegetable matter, large rocks, rubbish, brick and other undesirable material.
- 7. Install fills in indicated thickness.
- 8. Provide neat, uniform side slopes (smooth and graded) to those excavations not required to be filled.
- B. Fill Materials: Unless specifically shown otherwise, use the following materials:
  - 1. "Bank Run Gravel" in pipe trenches, around manholes and catch basins, against dampproofed foundation walls, where indicated as "gravel fill", and where else shown, free from loam, recycled materials, and other specified undesirable material, and conforming to the following analysis:

Sieve Size	% Passing by Weight
3"	100
1/2"	50-85
3/8"	45-80
#4	40-75
#40	15-35
#200	0-8

- a. On-site material may be used, only after satisfactory test data has been submitted, and only with the Architect's approval.
- 2. "Stone" (to stabilize utilities and foundations as necessary and where indicated) conforming to the following analysis:

Sieve Size	% Passing by Weight
2-1/4"	100
2"	90-100
1-1/2"	30-55
1-1/4"	0-25
1"	0-5
#200	0

3. "Filter Stone" (around french drains and combination drains, at retaining walls and where else indicated) shall be washed and free from clay, silt, organic matter, or other objectionable material and conforming to the following analysis:

% Passing by Weight
100
70-85
10-40
0-20
0-5
0

4. "Sand" (if indicated) consisting of clean, inert, hard, durable grains of quartz or other hard durable rock; free from loam or clay, surface coatings and deleterious material; and conforming to the following analysis:

Sieve Size	% Passing by Weight
#8	100
#50	25-40
#100	0-10
#200	0-5

- 5. Fill Material for Trenches:
  - a. Bedding for pipe "Bank Run Gravel", except with 100% passing 3/4" sieve (stone if unsuitable material is encountered).
  - b. Over pipe Two 6" layers of "Bank Run Gravel", except with 100% passing 3/4" sieve.
  - c. Remaining Fill "Bank Run Gravel"; approved on-site or new material, free from stones over 4" diameter and other specified undesirable materials.
- 6. Fill Material for Other Areas:
  - a. Any of the aforementioned.
  - b. Excess on-site material, as approved.

### 3.3 COMPACTION:

- A. General:
  - 1. Place fill in horizontal layers, beginning with the lowest areas and building up until the entire area to be filled is at a uniform elevation.
  - 2. Compact each layer with an approved vibratory device to achieve minimum density requirements.
  - 3. Continue compaction of each layer until there is no evidence of weaving or creeping. Compact places inaccessible to large equipment with approved mechanical tampers as well as around the perimeter of foundations, walls and around column pedestals and footings.
  - 4. Do not use rolling equipment in the area adjacent to the foundation and retaining walls.
  - 5. For compaction within building areas and/or beneath structures with foundations, see "Controlled Compacted Fill".
  - 6. Elsewhere, compact to 95% of maximum density in 12-inch loose layers, except for two 6-inch layers directly over pipes.
  - 7. Attention is directed to the grain size characteristics of the material and necessity for and difficulty of controlling and maintaining optimum moisture content during compaction. Material in each layer shall contain optimum moisture for maximum density compaction and the optimum moisture content shall be uniformly distributed throughout the layer. Harrowing or other working of the material may be required to produce uniformity and control of the water content.

- 8. Slope the surface of each layer 1%, plus or minus .25% at the conclusion of each day's work to provide surface drainage.
- 9. Maximum density for compacted soils shall be determined by ASTM D 1557, Method C.
- 10. Whenever in-place densities are below minimum acceptable limits, as determined by AASHTO T-191, T-205 or T-310 In-Place Density Testing by Nuclear Methods, additional compaction will be required to produce the specified densities, without additional cost to the Owner. When greater densities than the minimum specified are required by the Architect, the work will be subject to contract unit prices.

# 3.4 CONTROLLED COMPACTED FILL:

- A. All fills within the building area and/or beneath foundations shall be constructed prior to construction of foundations and shall be constructed under laboratory control to result in 98% of maximum density at optimum moisture below footing elevations and 95% of maximum density from elevation of bottom of footing to underside of slab. The extent of this fill is within 3 feet of foundations, proceeding out at a 45-degree angle, or as indicated on the site plan and in the typical earthwork section, or as directed.
- B. Retain a laboratory and Geotechnical Engineer approved by the Architect, to supervise and control the construction of the fill. This laboratory shall perform tests in accordance with ASTM D 1557 on the materials the Contractor proposed to use to establish the compacted dry weight at optimum moisture. Results of these tests shall be submitted to the Architect for approval and work may start only after the Architect approves the test results. The Architect, or approved testing laboratory under the direction of the Architect, shall provide continuous inspection of compacted fills.
- C. Backfilling material shall conform to laboratory requirements herein specified and shall be soil obtained from an approved borrow pit.
- D. Backfill in areas excavated after construction of the fill shall be constructed in layers whose loose thickness shall not exceed 6" and shall be thoroughly compacted with approved hand equipment to the density hereinbefore specified.
- E. Field tests of moisture content prior to compaction and dry weight after compaction shall be made by the laboratory to insure thorough and uniform compaction. Testing shall be performed on the layer just compacted.
- F. At least two tests of moisture content shall be made each day. Additional tests shall be made if material or moisture conditions change.

### 3.5 ROUGH GRADING:

- A. General:
  - 1. Grade effected work area on property to reasonably true and even surfaces, thoroughly compacted to indicated elevations.
  - 2. Slope ground away from existing and/or new footings / foundations to facilitate drainage.
  - 3. Grade to uniform levels or slopes between points where grades are noted or as necessary to facilitate proper drain per building codes.
  - 4. Round surfaces at abrupt changes in levels.
  - 5. Should figures conflict with contours, consult Architect.

- B. Levels:
  - 1. Grade lawn areas to 6" below finish grades.
  - 2. Ground cover areas to 9" below finish grade.
  - 3. Shrub beds to 3" below finish grade.
- C. Grading Around Trees:
  - 1. Raising Grade: (not more than 16 inches)
  - 2. Place washed gravel directly around trunk before any earth fill is placed near tree.
  - 3. Extend gravel not less than 18 inches around all sides of tree, top approximately 2 inches above finished grade at tree.
- D. Lowering Grades:
  - 1. Do regrading by hand to levels and extent indicated.
  - 2. Cut roots as required 3 inches inside bank, and paint ends with tree wound paint.

# 3.6 USE OF EXPLOSIVES:

- A. The use of explosives will not be permitted.
- B. Mechanical means shall be employed for rock removal.
- C. Non explosives agents such as Bustar (formally called Bristar) may be used when approved by Owner and Architect prior.

END OF SECTION 31 50 05

### SECTION 32 90 00 PLANTING

- PART 1 GENERAL
  - 1.1 SUMMARY
    - A. Section Includes
      - 1. Provide loam borrow, topsoil, seeding, and supporting materials in accordance with this Section and applicable reference standards listed in Article 1.03.
    - B. Related Requirements
      - 1. Section 31 00 00 Earthwork
      - 2. Section 31 25 00 Erosion and Sediment Control

#### 1.2 PRICE AND PAYMENT PROCEDURES

- A. Measurement and payment requirements: per Division 01 General Requirements.
- 1.3 REFERENCES
- A. Reference Standards
  - 1. American National Standards Institute (ANSI)
    - a. ANSI Z60.1 American Standard for Nursery Stock
  - 2. AOAC International (AOAC)
  - 3. ASTM International (ASTM)
    - a. ASTM D75 Standard Practice for Sampling Aggregates
    - b. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
  - 4. RIDOT Standard Specifications and Supplements, and Construction Details
  - 5. United States Department of Agriculture (USDA)

#### 1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.
  - 1.5 SUBMITTALS
- A. Submit in accordance with Division 01 General Requirements.
- B. Product Data
  - 1. Seeding and planting fertilizer showing composition and analysis

- a. Fertilization rates for fertilizer product based upon soil testing, analysis, and recommendations
- b. Receipt showing total quantity purchased for Project prior to installation
- C. Samples and Mockups: as specified in Article 1.06.
- D. Certificates: seeding and planting fertilizer composition and analysis.
- E. Manufacturer Instructions
- F. Source and Field Quality Control Submittals
  - 1. Suppliers' certified analysis in accordance with AOAC for non-standard products.
  - 2. Suppliers' certified analysis for soil amendments and fertilizer materials.
  - 3. Seed Supplier's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity germination and weed seed for each grass seed species.
  - 4. Certificates of agronomic rates from Supplier for organic matter used in loam borrow manufacturing process.
  - 5. Supplier's certifications for peat moss, limestone, acidulants, gypsum, additives needed to amend a specific soil.
- G. Provide submittals at least 30 days prior to ordering materials.
- H. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.
  - 1.6 QUALITY ASSURANCE
- A. Provide in accordance with Division 01 General Requirements.
  - 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Provide in accordance with Division 01 General Requirements.
- B. Packing, Shipping, Handling, and Unloading
  - 1. Do not order or deliver material until submittals are approved.
  - 2. Package products with manufacturers certified analysis.
  - 1.8 SITE CONDITIONS
- A. Existing Conditions: per Division 01 General Requirements.

# PART 2 – PRODUCTS

# 2.1 LOAM BORROW

- A. Provide in accordance with RIDOT Construction Details.
- B. Furnish sufficient loam borrow to complete loaming operations required for Project and as directed by Engineer. Obtain loam borrow from the following sources and meet requirements specified after testing and addition of necessary soil additives.
  - 1. Naturally well-drained areas that have never been stripped before and have a history of satisfactory vegetative growth. Comply with bylaws and Regulations regarding removal of topsoil.
  - 2. Commercial processing facility specializes in manufacturing of loam.

# 2.2 TOPSOIL

- A. Provide additional topsoil required to complete landscape work if quantity of stockpiled topsoil is insufficient.
- B. Furnish new topsoil, which is fertile, friable, natural loam surface soil found at a depth of not less than 4 inches from original ground surface, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, debris, and stones larger than 2 inches in any dimension.
- C. Obtain topsoil from local sources or from areas having similar soil characteristics as Site. Obtain topsoil only from naturally, well-drained Sites where topsoil occurs in a depth of not less than 4 inches. Do not obtain from bogs or marshes.

### 2.3 SEED AND SUPPORTING MATERIAL

- A. Provide seed, limestone, fertilizers, plant materials, water for irrigation and soil conditioners in accordance with RIDOT Construction Details, and ANSI Z60.1.
- B. If biosolid compost (R.I. Department of Environmental Protection- permitted material) is used as an organic component of proposed planting soil mixture, amount of organic material used shall not exceed agronomic rates for nitrogen and phosphorus for trees and shrubs, turf or ornamental perennials.

### 2.4 PLANTING TREES, SHRUBS AND GROUNDCOVER

A. Type: per RIDOT construction standard.

### 2.5 GRASS SEED

- A. Furnish fresh, clean, new crop seed, complying with tolerance for purity and germination established by AOSA. Do not use wet, moldy, or damaged seed. Seed mixtures listed below are proportions by weight.
  - 1. Germination: minimum 80 percent.
  - 2. Purity: minimum 85 percent.

- 3. Weed content: maximum 1 percent.
- B. Roadside Mixture
  - 1. 50 percent Creeping Red Fescue
  - 2. 15 percent Kentucky Bluegrass
  - 3. 2 percent Red Top Clover
  - 4. 25 percent Annual Ryegrass
  - 5. 3 percent Bird's Foot Trefoil, Variety Empire
  - 6. 5 percent White Clover
- C. Lawn Repair Mixture
  - 1. 60 percent Kentucky Bluegrass
  - 2. 20 percent Perennial Ryegrass
  - 3. 20 percent Chewings Fescue

### 2.6 FERTILIZER

- A. Bone meal: commercial, raw or steamed, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.
- C. Fertilizer: commercial grade complete fertilizer of neutral character, consisting of fast and slow release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition.
  - 1. Nitrogen, phosphorous and potassium in amounts recommended in topsoil analysis reports from a qualified soil testing agency.
  - 2. Minimum 1 pound per 1,000 square feet of actual nitrogen, 4 percent phosphorous and 2 percent potassium by weight.

# 2.7 EROSION AND SEDIMENTATION CONTROL

- A. Anti-erosion mulch: clean, seed-free threshed straw of wheat, rye, oats, or barley. Do not use hay.
- B. Erosion control mesh: uniform, open-weave jute matting or flexible vinyl mat. Acceptable level of quality: equivalent to Mira Mat erosion control.
- C. Acceptable level of quality for re-vegetation mat: equivalent to TenCate Mirafi.
  - 2.8 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

# PART 3 – EXECUTION

- 3.1 GENERAL
  - A. Avoid damage to utilities, buildings and private property.
  - B. Do not disturb property markers.
  - C. Immediately report damage to Engineer.
  - D. Complete landscape work immediately as portions of Site become available, working within seasonal limitations for each kind work. Notify Engineer before planting if conditions detrimental to plant growth are encountered.
  - E. Plant or install materials during normal planting seasons for each type of landscape work required, and as specified in Section 32 72 00.
  - F. Use topsoil stockpiled for re-use as specified in Section 31 00 00.
    - 3.2 LOAM BORROW
  - A. Place loam borrow at designated locations where plant material is to be installed or reinstalled in accordance with RIDOT Construction Details and Drawings, or as directed by Engineer.
  - B. Protect loam borrow delivered to Site from erosion and spread immediately. Cover material that sits on-Site for more than 24 hours with tarpaulin or other soil erosion system acceptable to Engineer, and surround with silt fence as shown on Drawings.
  - C. Do not handle, plant or use loam borrow if wet or frozen. Use moist loam borrow.
    - 3.3 PLANTING TREES, SHRUBS AND GROUNDCOVER
  - A. Provide in accordance with RI DOT Standard Details.
  - B. Prune injured roots or branches to make clean-cut ends prior to planting, utilizing clean, sharp tools, removing only injured or diseased branching.
  - C. Remove planting containers, baskets, and non-biodegradable materials from root balls during planting. Cut natural fiber burlap from around trunk of trees and folded down against root ball prior to backfilling.
  - D. Position trees and shrubs at intended locations shown on Drawings and obtain Engineer's approval prior to excavating pits, making necessary adjustments as directed.
  - E. Dig planting pits with level bottoms with width twice the diameter of root ball. Rest root ball on undisturbed grade. Backfill each plant pit in layers with thoroughly mixed, prepared soil; 1-part peat moss; 1-part composted cow manure by volume; 3 parts topsoil by volume.

- 1. Provide 21-gram planting tablets, acceptable level of quality: equivalent to Agriform.
  - a. 2 tablets per 1-gallon plant
  - b. 3 tablets per 5-gallon plant
  - c. 4 tablets per 15-gallon plant
  - d. Larger plants: 2 tablets per 1/2-inch caliper of trunk
- F. Fill prepared soil around ball of plant halfway, and insert plant tablets. Complete backfill, and water thoroughly.

### 3.4 FINE GRADING

- A. Clean subgrade of stones greater than 2 inches and all debris immediately prior to dumping and spreading loam borrow, and remove from Site. Do not rake to edges and bury. Obtain Engineer's approval of subgrade conditions prior to spreading loam borrow.
- B. Spread and thoroughly incorporate soil additives into layer of loam borrow by harrowing or other approved methods. Incorporate the following soil additives.
  - 1. Ground limestone or acidulants: as required by soil analysis to achieve required pH specified. Spread limestone at rate required by soil analysis up to maximum limit of 200 pounds per 1,000 square feet. Make a surface application of limestone not in excess of 50 pounds per 1,000 square feet to established planting area during the season after Final Acceptance if recommendations of soil analysis require rates of application greater than 200 pounds per 1,000 square feet.
  - 2. Fertilize at rate and analysis recommended by soil analysis.
  - 3. Use biosolid compost, peat moss, sand or other soil amendments as required by soil analysis.
- C. Prepare loam borrow by scarifying, harrowing, or tilling loam to integrate soil additives into top 6 inches of loam after loam borrow and required additives have been spread. Remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Remove all stones over 1-inch in diameter from top 6 inches of loam bed from unscreened soils. Remove smaller stones in excessive quantities as directed.
- D. Set sufficient grade stakes for checking finished grades. Set stakes in bottom of swales and at top of slopes. Do not deviate more than one-tenth of foot from indicated elevations. Connect contours and spot elevations with an even slope. Finish grades: smooth and continuous with no abrupt changes at top or bottom of slopes.
- E. Fill depressions caused by settlement or rolling during compaction process with additional loam borrow and regrade surface and roll until finish is smooth and even corresponding to required grades.
- F. Install loam borrow in successive horizontal lifts no thicker than 6 inches in turf areas

and 12 inches in plant bed areas to desired compaction as indicated. Install soil at a higher level to anticipate any reduction of loam borrow volume due to compaction, settling, erosion, and decomposition during Warranty Period. Obtain full depths of loam borrow for plant beds by digging holes in loam borrow at same frequency as for compaction testing.

- 1. Compact loam to specified density.
- 2. Maximum dry density for topsoil and loam: determined in accordance with ASTM D698. Achieve the following percentages of minimum to maximum dry densities for fill materials or prepared subgrades.
  - a. Fills within plant beds, tree pits and treeways: minimum 80 percent; maximum 85 percent for areas in top 18 inches of finished grade.
- 3. Scarify surface area of each lift by raking prior to placing next lift.
- G. Compact each lift to reduce settling, but not enough to prevent movement of water and feeder roots through the soil in addition to range cited above. Loam borrow in each lift: firm underfoot and make only slight heel prints. Loam borrow at completion of installation: firm, even resistance when a soil sampling tube is inserted from lift to lift. Perform percolation tests after placement of each lift to determine if soil has been over compacted using the following percolation test procedure.
  - 1. Dig a hole in installed soil minimum of 4 inches in diameter. Holes in 6-inch lift in turf areas: 4 inches deep. Holes in 12-inch lifts in plant beds: 8 inches deep. Do not penetrate through lift being tested.
  - 2. Fill hole with water and let it drain completely. Immediately refill hole with water and measure rate of fall in water level.
  - 3. Till soil to a depth required to break over compaction if water drains at a rate less than 1-inch per hour.
  - 4. Perform a minimum of 1 soil percolation test per 10,000 square feet of turf area, and 2,500 square feet of tree and shrub planting area as directed.
- H. Select equipment and phase installation of loam borrow so wheeled equipment does not travel over subsoil, placed fills or ordinary borrow, or already installed soil. Movement of tracked equipment over these soils will be reviewed and considered by Engineer for approval. If Engineer determines that wheeled equipment must travel over already installed soil, provide a written description of sequencing of Work that ensures compacted soil is loosened and uncompacted as Work progresses, or place 1-inch thick steel plate ballast or approved equivalent over length and width of any travelway to cover loam borrow to protect it from compaction.
- I. Grade disturbed areas outside limit of Work, smooth and spread with minimum 6 inches of loam borrow to finished grade.
- J. Maintain stockpiles of existing on-Site topsoil until final placement of existing on- site topsoil and loam borrow is approved. Provide survey data plotted on a 20-scale plan of the Site prepared by a registered surveyor or civil engineer, showing volume of stock-piles of existing on-Site topsoil. Remove excess, unused existing on-Site topsoil from

Site and legally dispose of upon approval.

- 3.5 SEED AND SUPPORTING MATERIAL
- A. Install and apply seed and supporting materials at rates of application in accordance with RIDOT Construction Details and the Drawings.
  - 3.6 HYDROSEEDING NEW AREAS
- A. Mix specified seed and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
- B. Apply slurry using an approved machine. Seed and suitable corn fiber mulch may be applied in 1 operation. Mix the materials with water in machine and agitate to keep mixture uniformly suspended. Use spraying equipment that will distribute slurry uniformly at required rates.
- C. Mulch areas with anti-erosion mulch with mulch blower at rate of 1,200 pounds per acre on level grades, 2,000 pounds on slopes if mulch is not part of slurry, immediately following hydroseeding.
- D. Seed only areas that can be mulched on same day.
  - 3.7 SEEDING NEW AREAS
- A. Where Hydroseeding is not possible, sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
- B. Do not sow immediately following rain or when the ground is too dry.
- C. Seed application rate
  - 1. New England Conservation Seed Mix: 1 pound per 1,750 square feet.
  - 2. All others: 1 pound per 1,000 square feet.
- D. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

### 3.8 PROTECTION OF SEEDED SLOPES

- A. Protect seeded slopes against erosion with erosion netting or other acceptable methods.
- B. Spread specified mulch after completion of seeding operations to form a continuous blanket not less than 1-1/2 inches' loose measurement over seeded areas.
- C. Anchor mulch by spraying with asphalt emulsion at rate of 10 to 13 gallons per 1,000 square feet. Prevent damage or staining of construction or other plantings adjacent to mulched areas.

- D. Lay matting smoothly on soil surface, burying top end of each section in narrow 6-inch trench. Leave 12-inch overlap from top roll over bottom roll. Leave 4-inch overlap over adjacent section.
- E. Staple outside edges and overlaps at 36-inch intervals.
- F. Lightly dress slopes with topsoil to ensure close contact between matting and soil.
- G. Unroll matting in direction of flow in ditches. Overlap ends of strips 6 inches with upstream section on top.
  - 3.9 FIELD QUALITY CONTROL
- A. Provide in accordance with Division 01 General Requirements.
- B. Replace rejected Work, and continue specified maintenance until re-inspected by Engineer and accepted. Remove rejected plants and materials promptly from Site.
  - 3.10 CLEANING
- A. Keep pavement, sidewalks, and walkways clean. Maintain protection during installation and maintenance periods.
  - 3.11 CLOSEOUT ACTIVITIES
- A. Provide in accordance with Division 01 General Requirements.
  - 3.12 MAINTENANCE
- A. Provide maintenance of grass seeded areas immediately after planting.
- B. Maintain grass by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading, and replanting as required to establish smooth, acceptable lawn areas free of eroded or bare areas.
- C. Maintain grassed areas to establish acceptable lawn until Final Completion or for a minimum of 180 days, whichever is longer, by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading, and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.
- D. Maintain trees and shrubs until Final Completion, or for a minimum of 180 days, whichever is longer.

### END OF SECTION