



Procurement Department

INVITATION FOR BIDS (IFB)

FOR

T. L. Shaley Burn Unit Rebuild

FOR

**HOUSING AUTHORITY OF THE
CITY OF SAN ANTONIO, TEXAS**

AND

AFFILIATED ENTITIES

IFB# 1809-909-23-4837

Prepared by:

**Department of Procurement
Of the
San Antonio Housing Authority
818 South Flores Street
San Antonio, Texas 78204**

President & CEO David Nisivoccia

Invitation For Bids
For
T. L. Shaley Burn Unit Rebuild

The Housing Authority of the City of San Antonio, Texas and its affiliated entities d/b/a San Antonio Housing Authority ("SAHA") hereby invites qualified independent Contractors to submit bids for the rebuilding of a burned duplex unit (830/832) at the T.L. Shaley Apartments.

As a part of our social mission and federal mandate, SAHA is committed to providing economic, training and educational opportunities to the low income individuals in the communities we serve. All contractors are required to recruit and hire low income individuals for new positions and provide training & educational opportunities to the greatest extent feasible for these individuals.

The Invitation for Bids can be obtained by calling 210-477-6059 or online at

www.saha.org

<http://nahro.economicengine.com>

<http://www.publicpurchase.com/gems/saha.tx/buyer/public/home>

Notice: Contact with members of the SAHA Board of Commissioners, or SAHA officers and employees other than the contact person listed herein, by any prospective Bidder, after publication of the IFB and prior to the execution of a contract with the successful bidder(s) could result in disqualification of your bid. In fairness to all prospective bidder(s) during the IFB process, if SAHA meets in person with anyone representing a potential provider of these services to discuss this IFB other than at the pre-submittal meeting, an addendum will be issued to address all questions so as to insure no Bidder has a competitive advantage over another. This does not exclude meetings required to conduct business not related to the IFB or possible personal presentations after written qualifications have been received and evaluated.

HOUSING AUTHORITY OF THE
CITY OF SAN ANTONIO, TEXAS

By: _____
Muriel Rhoder
Contracting Officer

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IFB INFORMATION AT A GLANCE

POINT OF CONTACT	Charles Bode Assistant Director of Procurement Phone: (210) 477-6703 Fax: (210) 477-6167 charles_bode@saha.org
DATE ISSUED	September 24, 2018
NON-MANDATORY PRE-SUBMITTAL MEETING	October 2, 2018 at 10:00 a.m. SAHA Central Office, 818 S. Flores, San Antonio, TX 78204
LAST DATE FOR QUESTIONS	October 3, 2018 at 3:00 p.m.
BID DUE DATE	October 11, 2018 at 2:00 p.m. SAHA Procurement Dept. 818 S. Flores, San Antonio, TX 78204
ANTICIPATED APPROVAL BY THE BOARD	November/December 2018
SUBMITAL REQUIREMENTS	1 (one) Original signature document marked "ORIGINAL" and 2 (two) exact copies marked "COPY" in a sealed envelope or container.

INTRODUCTION

The San Antonio Housing Authority (SAHA) is a public housing agency created by resolution of the City of San Antonio in 1938 pursuant to the Texas Housing Authorities Law (now Chapter 392 of the Texas Local Government Code) and federal law. SAHA is a unit of government and its functions are essential governmental functions. The property of SAHA is used for essential public and governmental purposes and is exempt from all taxes, including sales tax on all its purchases of supplies and services.

SAHA enters into and executes contracts and other instruments that are necessary and convenient to the exercise of its powers. SAHA maintains contractual arrangements with United States Department of Housing and Urban Development (HUD) to manage and operate its low rent public housing program and administers the Section 8 Housing Assistance Payments Programs. SAHA programs are federally funded along with development and modernization grants and rental income.

Its primary activity is the ownership and management of over 6,300 public housing units. It also administers rental assistance for almost 12,000 privately owned rental units through the Section 8 program. It operates and manages its housing developments to provide decent, safe, sanitary and affordable housing to low income families, the elderly, and the disabled, and implements various programs designed and funded by HUD.

SAHA has created a number of affiliated public facility corporations (“PFCs”) pursuant to Chapter 303 of the Texas Local Government Code (the Public Facility Corporation Act). In some instances, these PFCs own projects. In other cases, PFCs or other related entities serve as partners in partnerships that have been awarded low-income housing tax credits. SAHA’s affiliated entities own and operate over 3,000 units of affordable housing.

SAHA staff also manages the San Antonio Housing Finance Corporation (“Finance Corporation”), which is primarily a conduit issuer of bonds for developers of affordable housing projects. The Finance Corporation was created pursuant to Chapter 394 of the Texas Local Government Code (the Texas Housing Finance Corporations Act). When used herein, “SAHA” shall include its affiliated entities.

INVITATION FOR BID

1.0 GENERAL INFORMATION

- 1.1 **Statement of Purpose:** The Housing Authority of the City of San Antonio and its affiliated entities (SAHA) are seeking bids from independent contractors with demonstrated professional competence and experience to provide for the rebuilding of a duplex unit (Apartments 830/832) that burned at the T.L. Shaley Apartments as specified herein.
- 1.2 Bidders acknowledge that submitting a bid to SAHA is not a right to be awarded a contract, but only an offer by the Bidder to perform the requirements of the IFB documents in the event SAHA decides to award a contract to that Bidder.
- 1.3 **Non-Mandatory Pre-Bid Conference:** A pre-bid conference will be held at SAHA Central Office, located at 818 South Flores, San Antonio, Texas 78204 as indicated herein. The purpose of this conference is to assist Bidders in understanding of the IFB documents and required submittal documents. At this conference, SAHA will conduct an overview of the IFB documents, including attachments. Any questions concerning the scope must be presented in writing (e-mail is acceptable) to the contact person listed herein and will be answered in an addendum.
- 1.4 **Bidder's Responsibilities-Contact with SAHA:** Bidders shall address all communication and correspondences pertaining to this IFB process to contact listed herein only. Bidders must not inquire or communicate with any other SAHA staff member or official (including members of the Board of Commissioners) pertaining to this IFB. Failure to abide by this requirement is cause for a bid to be disqualified. During the IFB solicitation process, SAHA will not conduct any ex parte conversations which may give one prospective Bidder an advantage over other prospective Bidders.

2.0 SAHA'S RESERVATION OF RIGHTS

- 2.1 SAHA reserves the right to reject any or all bids, to waive any informality in the IFB process, or to terminate the IFB process at any time, if deemed by SAHA to be in its best interests.
- 2.2 SAHA reserves the right not to award a contract pursuant to this IFB.
- 2.3 SAHA reserves the right to terminate a contract awarded pursuant to this IFB, at any time for its convenience upon 30 days written notice to the successful Bidder(s).
- 2.4 SAHA reserves the right to determine the days, hours and locations that the successful Bidder(s) shall provide the services called for in this IFB.

- 2.5** SAHA reserves the right to retain all bids submitted and not permit withdrawal for a period of 90 days subsequent to the deadline for receiving bids without the written consent from SAHA.
- 2.6** SAHA reserves the right to reject and not consider any bid that does not meet the requirements of this IFB, including but not necessarily limited to incomplete bids and/or bids offering alternate or non-requested services and from individuals deemed non responsible.
- 2.7** SAHA shall have no obligation to compensate any Bidder for any costs incurred in responding to this IFB.
- 2.8** SAHA reserves the right to at any time during the IFB or contract process to prohibit any further participation by a Bidder or reject any bids submitted that does not conform to any of the requirements detailed herein. Each prospective Bidder further agrees that he/she will inform SAHA in writing within five (5) days of the discovery of any item that is issued thereafter by SAHA that he/she feels needs to be addressed. Failure to abide by this timeframe shall relieve SAHA, but not the prospective Bidder, of any responsibility pertaining to such issue.
- 2.9** SAHA reserves the right to, prior to award, revise, change, alter or amend any of the instructions, terms, conditions, and/or specifications identified within the IFB documents issued, within any attachment or drawing, or within any addenda issued. All addenda will be posted on SAHA's website www.saha.org, www.publicpurchase.com and <https://nahro.economicengine.com>. Such changes that are issued before the bid submission deadline shall be binding upon all prospective Bidders.
- 2.10** In the case of rejection of all bids, SAHA reserves the right to advertise for new bids or to proceed to do the work otherwise.
- 2.11** SAHA reserves the right to, without any liability; cancel the award of any bid(s) at any time before the execution of the contract documents by all parties.
- 2.12** SAHA reserves the right to add or delete to the estimated or actual quantities, shown herein, in whatever amount necessary, including complete properties, without prejudice or liability to SAHA, if:
- 2.12.1** Funding is not available,
- 2.12.2** Legal restrictions are placed upon the expenditure of monies for this category of service or supplies; or,
- 2.12.3** SAHA's requirements in good faith change after award of the contract.
- 2.13** SAHA reserves the right to make an award to more than one Bidder based on cost and the Bidder being considered responsive and responsible.

- 2.14 SAHA reserves the right to require additional information from all Bidders to determine level of responsibility. Such information shall be submitted in the form and time frame required by SAHA.
- 2.15 SAHA reserves the right to require the Contractor to keep accurate timesheets for all employees assigned to perform any project, task, or assignment resulting from this IFB and any resulting contract.
- 2.16 SAHA reserves the right to contact any individuals, entities, or organizations that have had a business relationship with the Bidder regardless of their inclusion in the reference section of the bid submittal.
- 2.17 In the event any resulting contract is prematurely terminated due to non-performance and/or withdrawal by the Contractor, SAHA reserves the right to seek monetary restitution (to include but not limited to withholding of monies owed) from the Contractor to cover costs for interim services and/or cover the difference of a higher cost (difference between terminated Contractor's rate and new company's rate) beginning the date of Contractor's termination through the contract expiration date.
- 2.18 SAHA reserves the right to amend the contract any time prior to contract execution.

3.0 **GENERAL CONDITIONS:**

- 3.1 **SPECIFICATIONS:** The Contractor shall provide the goods or services as specified in this IFB and any attached HUD Documents. Specifications are in Attachment A.
- 3.2 **REGULATORY/LICENSING:** Contractor shall comply with all applicable federal, state and local laws, rules, regulations, ordinances and codes and obtain any licenses or permits required to provide the services under this IFB. Obtaining licenses and permits shall be the sole responsibility of the successful Bidder whether or not they are known to either the SAHA or the Bidders at the time of the submittal deadline or the award.
- 3.3 **SECTION 3: Contactor is required to prepare and submit monthly reports on Section 3.** Contractor shall utilize Section 3 residents and businesses as defined in Attachment D to perform the requirements under this IFB to the greatest extent feasible and shall document such efforts monthly. There is a 30% goal for hiring Section 3 residents on any contract resulting from this IFB, a subcontracting goal of 10% for Section 3 Businesses for construction contracts and a subcontracting goal of 3% with Section 3 Businesses for non-construction contracts. Contractors will be evaluated on their performance at achieving this goal and such evaluation shall be a factor in future awards.
FAILURE TO PROVIDE A SECTION 3 PLAN MAY CAUSE THE SUBMITTAL TO BE DISQUALIFIED AS NON-RESPONSIVE.

- 3.4 SMALL, WOMAN, MINORITY BUSINESS ENTERPRISES (SWMBE):** The Proposer is required to include a plan identifying the Proposer's good faith efforts to assist SAHA in its responsibility to foster the development of small and historically under-utilized business enterprises including woman owned, minority owned, disabled veteran owned business enterprises and other business enterprises owned and recognized by HUD as having privileged status. **All** subcontracting opportunities shall be outlined in this plan and any subcontractors listed on the Subcontractor's form provided in Attachment C. **FAILURE TO PROVIDE A SWMBE PLAN MAY CAUSE THE SUBMITTAL TO BE DISQUALIFIED AS NON-RESPONSIVE.**
- 3.5 RESPONSIBILITY FOR SUBCONTRACTORS:** All requirements for the "Prime" contractor shall also apply to any and all subcontractors. It is the Prime Contractors' responsibility to insure the compliance by the subcontractors. Regardless of subcontracting, the Prime Contractor remains liable to SAHA for the performance under this IFB or any resulting contract.
- 3.6 CRIMINAL HISTORY/DRUG TESTING;** Contractor shall perform criminal history checks and drug screening tests on all employees performing work under this IFB and any resulting contract and if requested provide summaries of the results to SAHA. Prospective employees whose criminal history checks discloses a misdemeanor or felony conviction involving crimes of moral turpitude or harm to persons or property shall not be used to perform work under this IFB or any resulting contract. Contractor is required to perform drug screening of all employees and to insure acceptable test results. Criminal history and drug screening checks will be completed at the sole expense of the Contractor.
- 3.7 LIQUIDATED DAMAGES:** For each day that performance under a resulting contract from this IFB is delayed beyond the time specified for completion, the successful Bidder shall be liable for liquidated damages in the amount of \$25.00 per day. However, the timeframe for performance may be adjusted at SAHA's discretion in writing and received by the successful Bidder prior to default under any resulting contract.
- 3.8 UNACCEPTABLE EMPLOYEES:** If any employee of the Contractor is deemed unacceptable by SAHA, Contractor shall immediately replace such personnel with a substitute acceptable to SAHA.
- 3.9 UNIFORMS/BADGES:** Contractor shall provide uniforms and/or ID badges for all employees working on SAHA's properties. No employee will be allowed on SAHA's properties out of uniform and/or without an ID badge.
- 3.10 WARRANTY:** All items installed/provided under any contract resulting from this IFB must include a minimum of a two (2) year warranty from the Contractor for labor, materials, and installation except as specified otherwise herein. This period will begin on the date of "FINAL" acceptance by SAHA.

- 3.10.1** The services provided under the contract shall conform to all information contained within the IFB documents as well as applicable Industry Published Technical Specifications, and if one of the above mentioned Specifications contains more stringent requirements than the other, the more stringent requirements shall apply.
- 3.10.2** In addition to all other warranties, the warranty shall include the warranty for merchantability and the warranty of fitness for a particular purpose.
- 3.10.3** Contractor shall assign any warranties and guarantees to SAHA and provide the Contractor's Warranty for Labor and Installation to SAHA along with all Manufacturers' Warranty documents.
- 3.11 SUBMISSIONS:** Late submissions will not be accepted. Submissions received prior to the opening will be held in confidence until the opening.
- 3.12 PROPOSED COST:**
- 3.12.1 Base Costs:** Your proposed fee for each item is inclusive of all necessary costs to provide the proposed services, including, but not limited to: employee costs and benefits; clerical support; overhead; profit; supplies; materials; licensing; insurance, vehicle fuel, etc. Each fee proposed shall be fully "burdened" with profit and overhead costs.
- 3.12.2 Unit Prices:** Your proposed unit price for each item listed on the Unit Price Sheet, if required, shall be inclusive of all expenses incurred to perform the service under this IFB and any resulting contract. Unit Price shall include but not be limited to, employee costs and benefits, clerical support, overhead, profit, supplies, materials, equipment, licensing, insurance, bonding, vehicle fuel, etc. In case of a discrepancy between a unit price and an extension the unit price prevails.
- 3.12.3** Contractor shall provide at contractor's own expense all equipment, labor, materials, supplies, and tools unless specified otherwise.
- 3.13 Taxes:** SAHA, as a governmental entity, is exempt from Texas State Sales and Use Taxes and Federal Excise Taxes. A letter of Tax Exemption will be provided upon request.
- 3.14 Delivery:** All costs submitted by the successful Bidder shall reflect the cost of delivering the proposed items and/or services to the locations specified within the IFB documents or within the Agreement. All costs in the bid submittal shall be quoted as FOB Destination, Freight Prepaid and allowed unless otherwise stated in this IFB.

- 3.14.1** The successful Bidder agrees to deliver to the designated location(s) on or before the date as specified in the finalized contract. Failure to deliver on or before the specified date constitutes an event of default by the successful Bidder. Upon default, the successful Bidder agrees that SAHA may, at its option, rescind the finalized contract under the termination clause herein and seek compensatory damages as provided by law.
- 3.15 “Or Equal”:** Catalogs, brand names or manufacturer’s references where provided are descriptive only and indicate type and quality desired. Bids on brands of like nature and quality will be considered unless specified otherwise. If bidding other than the referenced manufacturer, brand or trade name, Bidder must provide a complete description of product offered, and illustrations and must be included in the bid submittal. Failure to include the above referenced data will require Contractor to furnish the specified brand names, numbers, etc.
- 3.16 TYPE OF CONTRACT:** Firm fixed contract with the option to extend at the sole discretion of SAHA.
- 3.17 BONDING:**
- 3.17.1** SAHA requires a Bid Bond for this bid in the amount of 5% of the Base Bid. Bid Bond shall be submitted with the Proposal Fee Sheet. Bid Bond must be submitted with proposal. Proposals without Bid Bond will be rejected.
- 3.17.2** Performance Bond: The Contractor must provide SAHA a 100% Performance Bond for total contract value, however if the Contractor is unable to acquire the equitable bonding that is acceptable to SAHA within ten (10) days of signed contract, then the Contractor will be deemed in breach of contract.
- 3.17.3** Payment Bond: The Contractor must provide SAHA a 100% Payment Bond for each Project Contract executed by SAHA, however if the Contractor is unable to acquire the equitable bonding that is acceptable to SAHA within ten (10) days of signed contract, then the Contractor will be deemed in breach of contract.
- 3.18 PERMITS:** Permits are the responsibility of the awarded contractor.
- 3.19 COMMUNICATIONS:**
- 3.19.1 Form:** All claims, notices, demands, requests, instructions, approvals and proposals must be submitted in writing.

- 3.19.2 Notice to Contractor:** Any Notices or Demands upon the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Contract or at such other office as he / she may from time to time designate in writing to SAHA or deposited in the United States mail in a sealed, postage-prepaid envelope or if delivered with charges prepaid to any telegraph company for transmission and addressed to the office of the Contractor indicated on the signature page of the contract or such other address as may be subsequently specified in writing to SAHA.
- 3.19.3 Notice to SAHA:** All notification papers required to be delivered to SAHA or its designated representative shall, unless otherwise specified in writing to the Contractor, be delivered to attn. Procurement, SAHA at 818 South Flores, San Antonio, Texas, 78204; and any notice to or demand upon SAHA shall be sufficiently given if so delivered or deposited in the United States mail in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission to SAHA at the above address or to such other address as SAHA may subsequently specify in writing to the Contractor for such purpose.
- 3.19.4 Receipt:** Any such notice shall be deemed to have been given as of the time of actual delivery; or in the case of mailing, when the same should have been received in due course after the date of surrender to the Post Office; or in the case of telegrams, at the time of actual receipt, as the case may be.
- 3.20 Calculations:** The Contractor is responsible for field verifying the conditions and quantities required to deliver a complete and functional project. This shall include but is not limited to: demolition, disposal, preparation, installation, overhead, profit, bonding, general liability, labor burden, weather conditions, field verified quantities, and encumbrances. All Proposers' submitted Unit Price Items must include these variables. SAHA shall not pay additional sums for a Proposer's failure to factor these conditions into the Proposals. Failure to consider any of the factors listed shall not negate the Contractor's responsibility to perform if awarded a contract under this IFB.
- 3.20.1 Estimated Quantities:** Any quantities provided herein are strictly estimates unless specified otherwise. It is the Proposer's responsibility to determine the exact quantities required to provide a complete, finished, functional, and operational product. Unit prices, if requested, are to be utilized only for additional work requested by SAHA.
- 3.21 Project Occupancy:** For the purposes of this solicitation the development shall be considered fully occupied. The project site may also have various construction zones, phasing, mobilization, as well as other Contractors working on-site. Proposers must include these variables in their proposed fees. SAHA shall not pay additional sums for a proposer's failure to factor these conditions into their submittal.

- 3.22 Time for Completion:** The Contractor shall immediately mobilize and commence work at the time stipulated in the Notice to Proceed to the Contractor and shall be fully completed within **150 days** unless specified otherwise in contractor's response.
- 3.23 Safety:** Subject to prior approval by SAHA as to size, design, type and location, and to local regulations, the Contractor and his / her subcontractors shall erect Temporary Safety Signs for purposes of identification and controlling traffic. The Contractor shall furnish, erect, and maintain such signs as may be required by safety regulations and as necessary to safeguard life and property.
- 3.24 Builders Risk:** Contractor is required to acquire Builder's Risk Insurance for any project or projects resulting from this solicitation. In any case SAHA will not be responsible for any loss to Contractor's tools, materials, supplies, the building or project or any other coverage normally covered under Builder's Risk Insurance. See HUD form 5370 attached.
- 3.25 Storage:** The Contractor and his/her subcontractors may maintain with approval by the SAHA Property & Project Managers various Storage Facilities on the site as may be necessary in the proper conduct of the work. These shall be located to cause no interference with any work to be performed on the site by the Contractor or others. The Contractor shall consult with SAHA regarding the location(s) of these facilities on each site.
- 3.26 Removal of Temporary Facilities:** Upon completion of the project, or as directed by SAHA, the Contractor shall remove all temporary structures and facilities they installed from the site and leave the premises in equal or better condition than it was at turnover.
- 3.27 Final Inspection:**
- 3.27.1 Notice:** The Contractor shall provide prompt written notification to SAHA when all work is completed. A final project inspection shall be made when all work is completed. Until the final inspection has been made and project accepted by SAHA, SAHA shall not advance any of the retainage or make the final payment to the Contractor without the approval and concurrence of the Contracting Officer.
- 3.27.2 Inspection Date:** Upon receipt of the Contractor's notification of the date when the work has been completed, SAHA shall conduct a final Inspection within 2 calendar days.
- 3.27.3 Inspection Participants:** The final inspection shall be conducted by a SAHA representative/s, any System Manufacturer's Representative/s, and the Contractor's representative/s at a minimum.

3.27.4 Inspection Conference: The inspection team shall meet after completing the final inspection to determine whether the work has been completed in accordance with these specifications and produce a Punch List Schedule which describes any minor items of incomplete or unsatisfactory work and document if there are any major deficiencies which must be corrected by the Contractor and additional inspections scheduled prior to contract settlement.

3.28 Settlement Documents: The settlement document shall state that the work was completed in accordance with the construction documents, including change orders except any minor items identified on SAHA's proposed certificate of completion, the total amount due the Contractor and a separately stated amount for each unsettled claim against SAHA. It shall also state that SAHA is released of all liens and all claims except those expressly stated in the Contractor's release and that wages paid to laborers or mechanics were consistent with the wage rate requirements of the contract and there are no outstanding claims for unpaid wages, materials, or supplies.

3.29 Wage Rate: The Davis Bacon and Related Acts wage and reporting requirements apply to this project.

4.0 CONDITIONS TO PROPOSE:

4.1 Pre-Qualification: Bidders will not be required to pre-qualify in order to submit a bid. However, all Bidders will be required to submit adequate information showing that the bidder is qualified to perform the required work (i.e. Profile of Firm Form, Attachment C). Failure by the prospective Bidder to provide the requested information may, at SAHA's discretion, eliminate that Bidder from consideration, provided that all Bidders were required to submit the same information.

4.2 IFB Forms, Documents, Specifications and Drawings:

4.2.1 It shall be each Bidder's responsibility to examine carefully and, as may be required, properly complete all documents issued pursuant to this IFB.

4.2.2 Unless otherwise instructed, specifications and drawings (if provided) do not purport to show all of the exact details of the work. They are intended to illustrate the character and extent of the performance desired under the proposed contract and may be supplemented or revised from time to time.

4.3 Submission and Receipt by SAHA:

4.3.1 Time for Receiving Bids: Bids received prior to the submittal deadline shall be securely kept, unopened, by SAHA. No bid received after the designated deadline shall be considered.

- 4.3.1.1** Bidders are cautioned that any bid submittal that is time-stamped as being received by SAHA after the exact time set as the deadline for the receiving of bids shall be returned unopened to the Bidder. Any such bids inadvertently opened shall not be considered, but shall be ruled to be invalid. No responsibility will attach to SAHA or any official or employee thereof, for the pre-opening of, or the failure to open a bid not properly addressed and identified.
- 4.3.1.2** A total of one (1) original signature copy (marked "Original") and 2 exact copies (marked "Copy") shall be forwarded to the Procurement Dept. with the Bidder's name and return address and addressed as follows:

IFB # {Insert Number}
{Insert Exact Title of IFB}
{Insert Month, day, year, Time of Bid Opening}
The Housing Authority of the City of San Antonio
Procurement Department
818 S. Flores
San Antonio, Texas 78204

4.3.5 **Withdrawal of Bids:** Bids may be withdrawn as detailed in attached HUD Document (Attachment B). Negligence on the part of the Bidder in preparing his/her bid confers no right of withdrawal or modification of his/her bid after such bid has been received and opened.

4.3.5.1 **Procedure to withdraw bid submittal:** A request for withdrawal of a bid due to a purported error need not be considered by SAHA unless filed in writing by the Bidder within 48 hours after the bid deadline. Any such request shall contain a full explanation of any purported error and shall, if requested by SAHA, be supported by the original calculations on which the bid was computed, together with a certification and notarization thereon that such computation is the original and was prepared by the Bidder or his/her agent, who must be identified on the notarized form. The foregoing shall not be construed that such withdrawal will be permitted, as SAHA retains the right to accept or reject any proposed withdrawal for a mistake.

4.4 Questions/Inquires:

4.4.1 A Bidder may inquire or question any of the bid documents or any part of the information contained therein, by submitting, in writing to the contact person listed herein, at least eight (8) days prior to the bid submission deadline, a complete and specific explanation as to what he/she is requiring clarification. SAHA reserves the right to issue a revision to the applicable IFB requirements or may reject the Bidder's request.

4.4.2 Bidders must propose services that meet the requirements of the IFB documents. Substitutions to the specification and/or approved "equal" requests may be discussed at the scheduled pre-bid conference (if scheduled). All verbal instructions issued by the SAHA officers not already listed within the IFB documents shall only become official when issued as addenda or as a written answer issued pursuant to receipt of a written question.

5.0 **FORM OF BID:** The bid shall be submitted in the following manner. Failure to submit the bid in the manner specified may result in a premature opening of, post-opening of, or failure to open and consider that bid and may be cause for elimination of that Bidder from consideration for award.

5.1 **Tab 1, Form of Bid, Bid Fee Sheet, and Bidder's Certification:** These Forms are attached hereto as Attachment F to this IFB document. These Forms must be fully completed, and submitted under this tab. Any exceptions to the specifications or terms must be placed under this tab and "CLEARLY" labeled as such. Placement elsewhere shall render them null and void and they will not be considered.

5.2 **Tab 2, HUD Forms and Conflict of Interest Questionnaire:** These Forms are attached hereto as Attachment B to this IFB document and must be completed, executed where provided thereon and submitted under this tab.

5.3 **Tab 3, Profile of Firm Form:** The Profile of Firm Form is attached hereto as Attachment C to this IFB document. This two-page Form must be completed, executed and submitted under this tab.

5.4 **Tab 4, Client Information:** The Bidder shall submit three former or current clients, preferably other than SAHA, for whom the Bidder has performed similar or like services to those being proposed herein. The list shall, at a minimum, include for each reference:

5.4.5.1 The client's name;

5.4.5.2 The client's telephone number and address,

5.4.5.3 Description of services provided to the client, and

5.4.5.4 Date of services

- 5.5 Tab 5, Joint Venture/Partnerships:** The Bidder shall identify if this bid is a joint venture or partnership with another entity. Please remember that all information required from the Bidder under the proceeding or subsequent tabs must also be included for any joint venture or partner. One entity must be designated as the primary contact for the joint venture or partnership in the bid. Include a Profile of Firm Form for each entity. If no joint venture or partnership exists or will not be utilized, please provide this statement, "NO JOINT VENTURE/ NO PARTNERS"
- 5.6 Tab 6, Subcontractors:** Bidders must also provide SAHA with the name, contact information to include address, phone number, email address, core area of business, and years of expertise for each subcontractor and supplier and the minority status of each. A Profile of Firm Form must be completed for each subcontractor and included in this Tab. Bidder must realize that the actual usage of the subcontractor will be contingent upon SAHA's prior written approval, and Bidder remains responsible to SAHA for any and all services and goods provided pursuant to this IFB and any resulting contract. If no subcontractors will not be utilized, please provide this statement, "NO SUBCONTRACTORS" "Contractor intends to perform all work detailed in this IFB".
- 5.7 Tab 7, Section 3 Business Preference:** Any Bidder claiming a Section 3 Business Preference, shall under this tab include the fully completed and executed Section 3 applicant certification form for low-income employees for whom Bidder is seeking the preference, verification of total number of full-time employees, names and addresses of low-income residents who are Bidders employees. **Note: If you qualify as a Section 3 Business Concern, your bid will receive a preference over other bids as specified in Attachment D.**
- 5.8 Tab 8, Small/Minority/Disadvantaged/Veteran Business Enterprise Utilization Plan:** The Bidder is required to include hereunder a plan to assist SAHA in its responsibility to foster the development of small and historically under-utilized business enterprises by identifying subcontracting opportunities with SWMBE companies. Contractor is required to show a good faith effort to employ SWMBE firms in the execution of this project. **FAILURE TO PROVIDE A S/W/MBE PLAN MAY CAUSE THE RESPONSE TO BE DISQUALIFIED AS NON-RESPONSIVE.**
- 5.9 Tab 9, Section 3 Good Faith Effort Compliance Plan:** Bidders are required to complete and submit the SECTION 3 PROGRAM GOOD FAITH EFFORT COMPLIANCE PLAN outlining their efforts to employ qualified Section 3 businesses or persons. The goal as stated in the Good Faith Effort Compliance Plan is thirty percent of new hires for Section 3 persons per contract. The subcontracting goal is ten percent for Section 3 Businesses for construction contracts and three percent for Section 3 Businesses for non-construction contracts. SAHA will provide a listing of qualified Section 3 Businesses upon request. **FAILURE TO PROVIDE THE SECTION 3 PROGRAM GOOD FAITH EFFORT COMPLIANCE PLAN MAY CAUSE THE RESPONSE TO BE DISQUALIFIED AS NON-RESPONSIVE**

5.10 Tab 10, Financial Viability and Other Information: Financial ability to provide such services to include copies of most recent financial statements and most recent audit if available. The Bidder may also include hereunder any other general information and copies of any licenses held or required.

5.11 Bid Submittal Binding Method: It is preferable and recommended that the Bidder bind the bid submittals in such a manner that SAHA can, if needed, remove the binding (i.e. "comb-type, etc.) or remove the pages from the cover (i.e. 3-ring binder, etc.) to make copies then return the bid submittal to its original condition.

6.0 MISTAKE IN BID

6.1 After a bid has been opened it may not be changed for the purpose of correcting an error in the pricing. This does not affect the common law right of the bidder to withdraw a bid due to a material mistake in the bid.

6.2 Irregular Bid Submittal: A bid shall be considered irregular for any one of the following reasons, any one or more of which may be reason for rejection:

6.2.1 If the forms furnished by SAHA are not used or are altered or if the bid costs are not submitted as required and where provided.

6.2.2 If all requested completed attachments do not accompany the bid submittal.

6.2.3 If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which may tend to make the bid incomplete, indefinite or ambiguous as to its meaning or give the Bidder submitting the same a competitive advantage over other Bidders.

6.2.4 If the Bidder adds any provisions reserving the right to accept or reject any award or to enter into a contract pursuant to an award.

6.2.5 If the individual cost bid items submitted by a specific Bidder are unbalanced in the sense that the listed price of any cost item departs by more than 25% from SAHA's cost estimate for that item.

6.3 Disqualification of Bidders: Any one or more of the following shall be considered as sufficient for the disqualification of a prospective Bidder and the rejection of his/her bid:

6.3.1 Evidence of collusion among prospective Bidders. Participants in such collusion will receive no recognition as Bidders or Proposer for any future work with SAHA until such participant shall have been reinstated as a qualified Bidder or Proposer. The names of all participants in such collusion shall be reported to HUD and any other inquiring governmental agency.

- 6.3.2** More than one bid for the same work from an individual, firm, or corporation under the same or different name(s).
- 6.3.3** Lack of competency, lack of experience and/or lack of adequate machinery, plant and/or other resources.
- 6.3.4** Unsatisfactory performance record as shown by past work for SAHA or with any other local, state or federal agency, judged from the standpoint of workmanship and progress.
- 6.3.5** Incomplete work, which in the judgment of SAHA, might hinder or prevent prompt completion of additional work, if awarded.
- 6.3.6** Failure to pay or satisfactorily settle all bills due on former contracts still outstanding at the time of letting.
- 6.3.7** Failure to comply with any qualification requirements of SAHA.
- 6.3.8** Failure to list, if required, all subcontractors (if subcontractors are allowed by SAHA) who will be employed by the successful Bidder(s) to complete the work of the proposed contract.
- 6.3.9** As required by the IFB documents, failure of the successful Bidder to be properly licensed by the City, County and/or the State of Texas and/or to be insured by a commercial general liability policy and/or worker's compensation policy and/or business automobile liability policy, if applicable. If a Bidder receives an award unless otherwise waived in the Contract, the Contractor will be required to provide original certificates of the following insurance requirements to SAHA within 10 days of contract signature:
- 6.3.10** Any reason to be determined, in good faith, to be in the best interests of SAHA.

7.0 Award of Bids(s): Bidders shall be recommended for award if they are deemed responsive and responsible and provide the "Best Value" to SAHA. SAHA also reserves the right to award on a by property basis. In determining the best value SAHA may consider:

- 7.1** The purchase price;
- 7.2** The reputation of the bidder and his goods or services;
- 7.3** The quality of the goods or services;
- 7.4** The extent to which the goods or services meet SAHA's needs;
- 7.5** The total long term cost;
- 7.6** Any relevant criteria listed herein;

8.0 INSURANCE: If a Bidder receives an award and unless otherwise waived in the Contract, the Contractor will be required to provide an original Certificate of Insurance confirming the following minimum requirements to SAHA within 10 days of contract signature:

Professional Liability	Required Limits
SAHA and its affiliates must be named as an Additional Insured and be a Certificate Holder. This is required for vendors who render observational services to SAHA such as appraisers, inspectors, attorneys, engineers or consultants.	\$1,000,000 Not Required for this contract
Business Automobile Liability	Required Limits
SAHA and its affiliates must be named as an additional insured and as the certificate holder. This is required for any vendor that will be using their vehicle to do work on SAHA properties.	\$500,000 combined Single limit, per occurrence
Workers Compensation and Employer's Liability	Required Limits
Workers' Compensation coverage is Statutory and has no pre-set limits. Employer's Liability limit is \$500,000. Workers' Compensation is required for any vendor made up of more than two persons. A Waiver of Subrogation in favor of SAHA must be included in the Workers' Compensation policy. SAHA and its affiliates must be a Certificate Holder.	Statutory Employer's Liability is \$500,000
Commercial General Liability	Required Limits
This is required for any vendor who will be doing hands on work at SAHA properties. SAHA and its affiliates must be named as an Additional Insured and as the Certificate Holder.	\$1,000,000 per accident \$2,000,000 aggregate

9.0 INVOICING:

- 9.1** Contractor(s) will only be allowed to invoice for the cost of services/goods in compliance with his/ her bid or best and final offer as accepted by SAHA.
- 9.2** Invoices must contain a complete description of the work or service that was performed, the contract price for each service, the purchase order number, contract number (if applicable), date of service, and address of service location or delivery address.
- 9.3** Contractor(s) must submit a separate invoice for each purchase order issued by SAHA unless prior approval is obtained from SAHA.
- 9.4** If applicable, SAHA may make progress payments approximately every 30 days as the work proceeds if work meets owner's standards, as approved by the Contracting Officer. SAHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses in accordance with HUD documents.
- 9.5** Upon the Award of Contract, Contractor shall complete the direct deposit form from SAHA to process all payments electronically to insure prompt and efficient payment of all invoices.
- 9.6** If offered by Contractor, SAHA seeks a discount for early payment. SAHA shall only take such a discount if earned.

- 9.7** To insure prompt and timely payment of invoices, unless utilizing a progress payment schedule, invoices shall be sent to the following address:

Email invoices to: Accounts_Payable@saha.org

If the contractor does not have the capability to email invoices they may be sent to the following address:

San Antonio Housing Authority
Finance and Accounting
P.O. Box 830428
San Antonio, TX 78283-0428

- 9.8** Contractor shall invoice SAHA within 60 days after the delivery of the goods or service. If contractor fails to invoice within 60 days SAHA reserves the right to not pay the invoice.

10.0 RIGHT TO PROTEST:

- 10.1** Rights: Any prospective or actual proposer or contractor, who is allegedly aggrieved in connection with the solicitation of a bid or award of a contract, shall have the right to protest. Such right only applies to deviations from laws, rules, regulations, or procedures. Disagreements with the evaluators' judgments as to the number of points scored are not reasons for an appeal. An alleged aggrieved protestant claiming this right is hereby informed that these regulations do not provide for administrative appeal as a matter of right for that alleged aggrieved protestant.

10.1.1 Definition: An alleged aggrieved "protestant" is a prospective proposer or proposer who feels that he/she has been treated inequitably by SAHA and wishes SAHA to correct the alleged inequitable condition or situation.

10.1.2 Eligibility: To be eligible to file a protest with SAHA pertaining to an IFB or contract, the alleged aggrieved protestant must have been involved in the IFB process in some manner as a prospective proposer (i.e. recipient of the IFB documents) when the alleged situation occurred. SAHA has no obligation to consider a protest filed by any party that does not meet these criteria.

10.1.3 Procedure: Any actual or prospective contractor may protest the solicitation or award of a contract for material violation of SAHA's procurement policy. Any protest against a SAHA solicitation must be received before the due date for receipt of Bids and any protest against the award of a contract must be received within ten calendar days after contract award or the protest will not be considered.

All protests must be in writing and submitted to the Director of Procurement for a written decision. The Director of Procurement shall make a recommendation to the Contracting Officer who shall issue a written decision and findings to the Contractor within 30 days from receipt of the written protest. This decision is then appealable to the Board of Commissioners within 30 days of receipt of the written decision. Appeals which are not timely filed will not be considered and the decision becomes final. All appeals shall be marked and sent to the address as listed in the example below:

APPEAL OF IFB NO. {Insert IFB # here}
San Antonio Housing Authority
Procurement Department
818 South Flores,
San Antonio, TX 78204

11.0 **ADDITIONAL CONSIDERATIONS:**

- 11.1 Government Standards:** It is the responsibility of the prospective Bidder to ensure that all items and services proposed conform to all local, state and federal law concerning safety (OSHA) and environmental control (EPA and Bexar County Pollution Regulations) and any other enacted ordinance, code, law or regulation. The successful Bidder shall be responsible for all costs incurred for compliance with any such possible ordinance, code, law or regulation. No time extensions shall be granted or financial consideration given to the successful Bidder for time or monies lost due to violations of any such ordinance, code, law or regulations that may occur.
- 11.2 Work on SAHA Property:** If the successful Bidder's work under the contract involves operations on SAHA premises, the successful Bidder shall take all necessary precautions to prevent the occurrence of any injury to persons or property during the progress of such work and shall immediately return said property to a condition equal to or better than the existing condition prior to the commencement of work at the site at no cost to SAHA.
- 11.3 Estimated Quantities:** Unless otherwise indicated, the quantities shown are estimates only and are used to evaluate the responses and may or may not reflect anticipated purchases. SAHA does not guarantee any minimum purchase quantity.
- 11.4 Official, Agent and Employees of the SAHA Not Personally Liable:** It is agreed by and between the parties hereto that in no event shall any official, officer, employee, or agent of the SAHA in any way be personally liable or responsible for any covenant or agreement herein contained whether expressed or implied, nor for any statement, representation or warranty made herein or in any connection with this agreement.

- 11.5 Subcontractors:** Unless otherwise stated within the IFB documents, the successful Bidder may not use any subcontractors to accomplish any portion of the services described within the IFB documents or the contract without the prior written permission of SAHA. Also, any substitution of subcontractors must be approved in writing by SAHA prior to their engagement.
- 11.6 Salaries and Expenses Relating to the Successful Proposers Employees:** Unless otherwise stated within the IFB documents, the successful Bidder shall pay all salaries and expenses of, and all Federal, Social Security taxes, Federal and State Unemployment taxes, and any similar taxes relating to its employees used in the performance of the contract. The successful Bidder further agrees to comply with all Federal, State and local wage and hour laws and all licensing laws applicable to its employees or other personnel furnished under this agreement.
- 11.7 Independent Contractor:** Unless otherwise stated within the IFB documents or the contract, the successful Bidder is an independent contractor. Nothing herein shall create any association, agency, partnership or joint venture between the parties hereto and neither shall have any authority to bind the other in any way.
- 11.8 Severability:** If any provision of this agreement or any portion or provision hereof applicable to any particular situation or circumstance is held invalid, the remainder of this agreement or the remainder of such provision (as the case may be), and the application thereof to other situations or circumstances shall not be affected thereby.
- 11.9 Waiver of Breach:** A waiver of either party of any terms or conditions of this agreement in any instance shall not be deemed or construed as a waiver of such term or condition for the future, or of any subsequent breach thereof. All remedies, rights, undertakings, obligations, and agreements contained in this agreement shall be cumulative and none of them shall be in limitation of any other remedy, right, obligation or agreement of either party.
- 11.10 Time of the Essence:** Time is of the essence as to each provision in which a timeframe for performance is provided in this IFB. Failure to meet these timeframes may be considered a material breach, and SAHA may pursue compensatory and/or liquidated damages under the contract.
- 11.11 Limitation of Liability:** In no event shall SAHA be liable to the successful Bidder for any indirect, incidental, consequential or exemplary damages.
- 11.12 Indemnity:** The Contractor shall indemnify and hold harmless SAHA and its officers, agents, representatives, and employees from and against all claims, losses, damages, actions, causes of action and/or expenses resulting from, brought for, or on account of any bodily injury or death of an employee of the Contractor, its agent, or its subcontractor of any tier received or sustained by any persons or property growing out of, occurring, or attributable to any work performed under or related to this Agreement, resulting in whole or in part from the negligent acts or omissions of the Contractor, any subcontractor, or any

employee, agent or representative of the Contractor or any subcontractor, AND **REGARDLESS OF WHETHER CAUSED IN WHOLE OR IN PART BY THE NEGLIGENCE OF SAHA. CONTRACTOR ACKNOWLEDGES AND AGREES THAT THIS INDEMNITY CONTROLS OVER ALL OTHER PROVISIONS IN THE AGREEMENT, SURVIVES TERMINATION OF THIS AGREEMENT, AND APPLIES TO CLAIMS AND LIABILITY ARISING OUT OF THE SOLE OR CONCURRENT NEGLIGENCE OF SAHA.**

Contractor shall indemnify and hold harmless SAHA, their agents, consultants and employees from and against any and all property damage claims, losses, damages, costs and expenses relating to the performance of this Agreement, including any resulting loss of use, *but only to the extent caused by the negligent acts or omissions of Contractor*, its employees, sub-subcontractors, suppliers, manufacturers, or other persons or entities for whose acts Contractor may be liable.

11.13 Public/Contracting Statutes. SAHA is a governmental entity as that term is defined in the procurement statutes. SAHA and this IFB and all resulting contracts are subject to federal, state and local laws, rules, regulations and policies relating to procurement as applicable.

11.14 Termination: Any contract resulting from this IFB may be terminated under the following conditions:

11.14.1 Consent: By mutual consent of both parties, and

11.14.2 Termination For Cause: As detailed within the attached HUD Forms.

11.14.2.1 SAHA may terminate any and all contracts for default at any time in whole or in part, if the contractor fails to perform any of the provisions of any contract, so fails to pursue the work as to endanger performance in accordance with the terms of the IFB or any resulting contracts, and after receipt of written notice from SAHA, fails to correct such failures within seven (7) days or such other period as SAHA may authorize or require.

11.14.2.1.1 Upon receipt of a notice of termination issued from SAHA, the Contractor shall immediately cease all activities under any contract resulting from this IFB, unless expressly directed otherwise by SAHA in the notice of termination.

11.14.2.1.2 SAHA may terminate any contract resulting from this IFB in whole or in part, if funding is reduced, or is not obtained and continued at levels sufficient to allow for the expenditure.

11.14.3 Termination for Convenience: In the sole discretion of the Contracting Officer, SAHA may terminate any and all contracts resulting from this IFB in whole or part upon thirty days prior notice to the Contractor when it is determined to be in the best interest of SAHA.

11.14.4 The rights and remedies of SAHA provided under this section are not exclusive and are in addition to any other rights and remedies provided by law or under any contract.

11.14.5 In the event the resulting contract from this IFB is terminated for any reason, or upon its expiration, SAHA shall retain ownership of all work products including deliverables, source and object code, microcode, software licenses, and documentation in whatever form that may exist. In addition to any other provision, the Contractor shall transfer title and deliver to SAHA any partially completed work products, deliverables, source and object code, or documentation that the Contractor has produced or acquired in the performance of any resulting contract.

11.15 Examination and Retention of Contractor's Records: SAHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until three years after final payment under all contracts executed as a result of this IFB, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audits, examinations, excerpts and transcriptions.

11.16 Inter-local Participation

11.16.1 SAHA may from time to time enter into Inter-local Cooperation Purchasing Agreements with other governmental entities or governmental cooperatives (hereafter collectively referred to as "Entity" or "Entities") to enhance SAHA's purchasing power. At SAHA's sole discretion and option, SAHA may inform other Entities that they may acquire items listed in this IFB. Such acquisition(s) shall be at the prices stated herein, and shall be subject to Contractor's acceptance.

11.16.2 In no event shall SAHA be considered a dealer, remarketer, agent or other representative of Contractor or Entity. Further, SAHA shall not be considered and is not an agent; partner or representative of the Entity making purchases hereunder, and shall not be obligated or liable for any such order.

11.16.3 Purchase orders shall be submitted to Contractor by the individual Entity.

11.16.4 SAHA shall not be liable or responsible for any obligation, including but not limited to, payment and for any item or service ordered by an Entity, other than SAHA.

11.17 Right to data and Patent Rights: In addition to other ownership & use rights SAHA shall have exclusive ownership of all, proprietary interest in, and the right to full and exclusive possession of all information, materials, documents, software, and all electronic data discovered or produced by Contractor and/or subcontractor(s) pursuant to the terms of any resulting contract, including but not limited to, reports, memoranda or letters concerning the research and reporting tasks of any resulting contract. Both parties agree to comply with HUD Bulletin 909-23, which is the Notice of Assistance Regarding Patent and Copyright Infringement.

11.18 Lobbying Certification: By proposing to do business with SAHA or by doing business with SAHA, each Bidder certifies the following:

11.18.1 No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder, to any person for influencing or attempting to influence an officer or employee of Congress, or an employee of a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan or cooperative agreement.

11.18.2 If any funds other than Federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form "Disclosure Form to Report Lobbying", in accordance with its instructions (See Attachment B).

11.18.3 The successful Bidder shall require that the language of this certification be included in the award documents for all sub-awards at all tiers, (including but not limited to subcontractors, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

11.18.4 This clause is a material representation of fact upon which reliance will be placed when the award is made or a contract is entered into. The signing of a contract or acceptance of award certifies compliance with this certification, which is a prerequisite for making or entering into a contract, which is imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certifications shall be subject to civil penalty of not less than \$10,000.00 and not more than \$100,000.00 for each such failure.

11.19 Applicable Statutes, Regulations & Orders: Contractors shall comply with all statutes, rules, regulations, executive orders affecting procurements by Housing Authorities including but not limited to:

- 11.19.1 Executive Order 11246
- 11.19.2 Executive Order 11063
- 11.19.3 Copeland “Anti-Kickback” Act (18 USC 874)
- 11.19.4 Davis Bacon Act (40 USC 276a-276a-7)
- 11.19.5 Clean Air & Water Acts (42 USC 1857(h); 33 USC 1368)
- 11.19.6 Contract Work Hours & Safety Standards Act (40 USC 327-330)
- 11.19.7 Energy Policy & Conservation Act (PL 94-163, 89 STAT 871)
- 11.19.8 Civil Rights Act of 1964, Title VI (PL 88-352)
- 11.19.9 Civil Rights Act of 1968, Title VIII (PL 90-284 Fair Housing Act)
- 11.19.10 Age Discrimination Act of 1975
- 11.19.11 Anti-Drug Abuse Act of 1988 (42 USC 11901 et. Seq.)
- 11.19.12 HUD Information Bulletin 909-23
- 11.19.13 Immigration Reform & Control Act of 1986
- 11.19.14 Fair Labor Standards Act (29 USC 201, et. Seq.)

11.21 Additional Information: Each provision of law and each clause, which is required by law to be inserted in this IFB or any contract, shall be deemed to have been inserted herein, and this IFB and any resulting contract shall be read and enforced as though such provision or clause had been physically inserted herein. If, through mistake or otherwise, any such provision is not inserted or is inserted incorrectly, this agreement shall forthwith be physically amended to make such insertion or correction upon the application of either party. The fore-mentioned statutes, regulations and executive orders are not intended as an indication that such statute, regulation or executive order is necessary applicable nor is an omission of such statute, regulation or executive order intended to indicate that it is not applicable.

11.22 Conflicting Conditions: In the event there is a conflict between the documents comprising this IFB and any resulting contracts, the following order of precedence shall govern: (1) the more restrictive terms of either: any and all attached HUD forms and the term/conditions in the body of any resulting contract; (2) the IFB; and (3) Contractor’s Response. In the event that a conflict exists between any state statute or federal law the most restrictive terms shall apply.

11.23 Contract Form: SAHA will not execute a contract on the successful Bidder’s form. Contracts will only be executed on SAHA’s form. By submitting a bid, the successful Bidder agrees to this condition. However, SAHA will consider any contract clauses that the Bidder wishes to include therein, but the failure of SAHA to include such clauses does not give the successful Bidder the right to refuse to execute SAHA’s contract form. It is the responsibility of each prospective Bidder to notify SAHA, in writing, with the bid submittal of any contract clauses that he/she is not willing to include in the final executed contract. SAHA will consider such clauses and determine whether or not to amend the Contract.

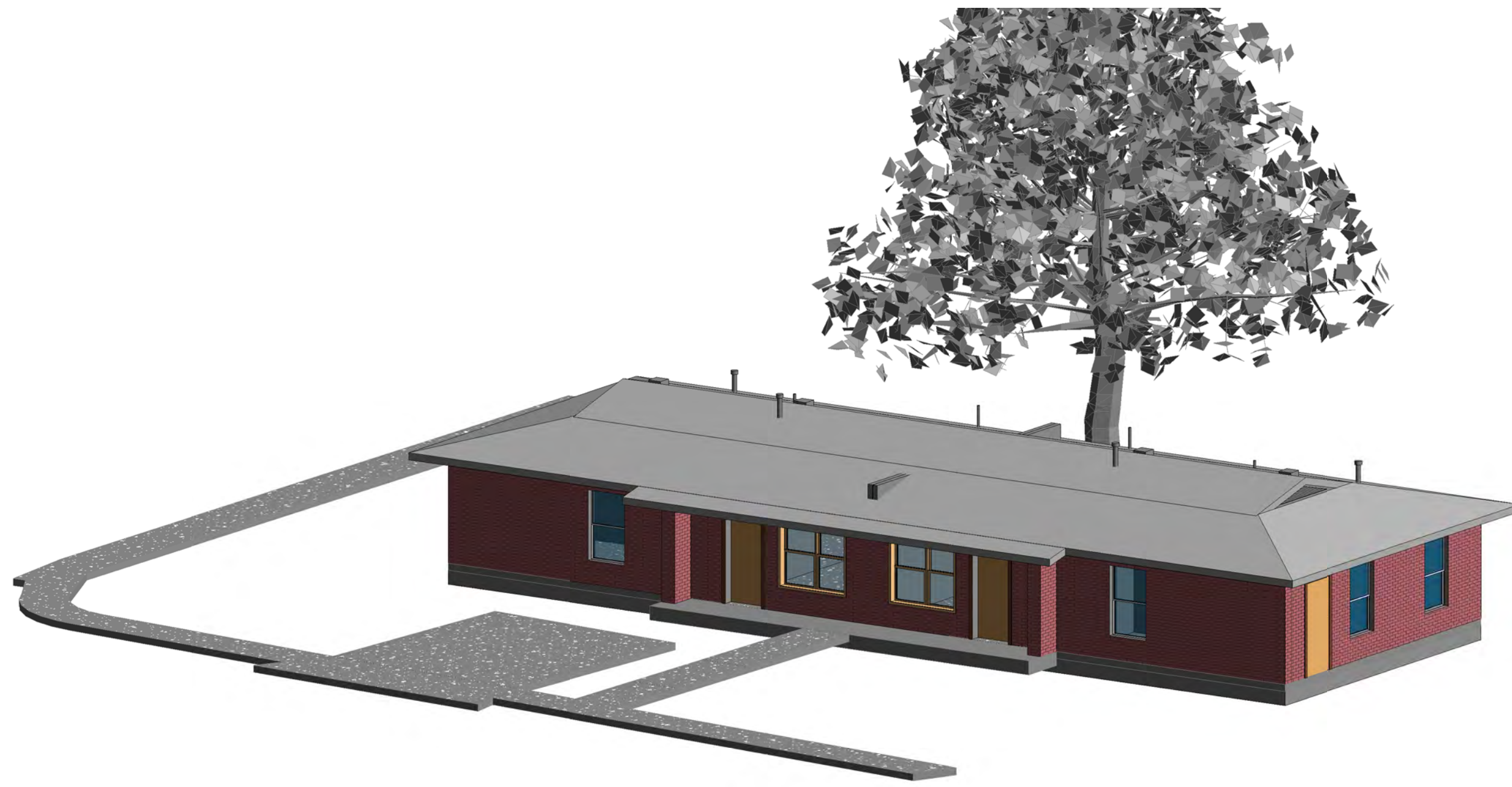
- 11.24 Force Majeure:** Neither SAHA nor Contractor shall be held responsible for delays or default caused by fire, flood, riot, acts of God or war where such cause was beyond, respectively, SAHA or Contractor's reasonable control. Contractor shall make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under this Agreement.
- 11.25 Non-Boycott of Israel:** Texas prohibits a governmental entity from doing business with any vendor for goods or services unless that vendor verifies in the contract that "they i) do not boycott Israel and ii) will not boycott Israel during the term of the contract".
- 11.26 TX Gov. Code 2252.152:** Prohibits a government entity from awarding a contract to a company identified as Iran, Sudan, or a Foreign Terrorist Organization as identified on a list maintained by the Texas Comptroller of Public Accounts.

ATTACHMENT A Specifications

NOTE:

If there are any conflicts between the Terms and Conditions in the following specifications and the Terms and Conditions of the SAHA and/or HUD Forms the Terms and Conditions of the SAHA and/or HUD forms will prevail unless specifically noted otherwise.

TL SHALEY APARTMENTS AN APARTMENT RESTORATION



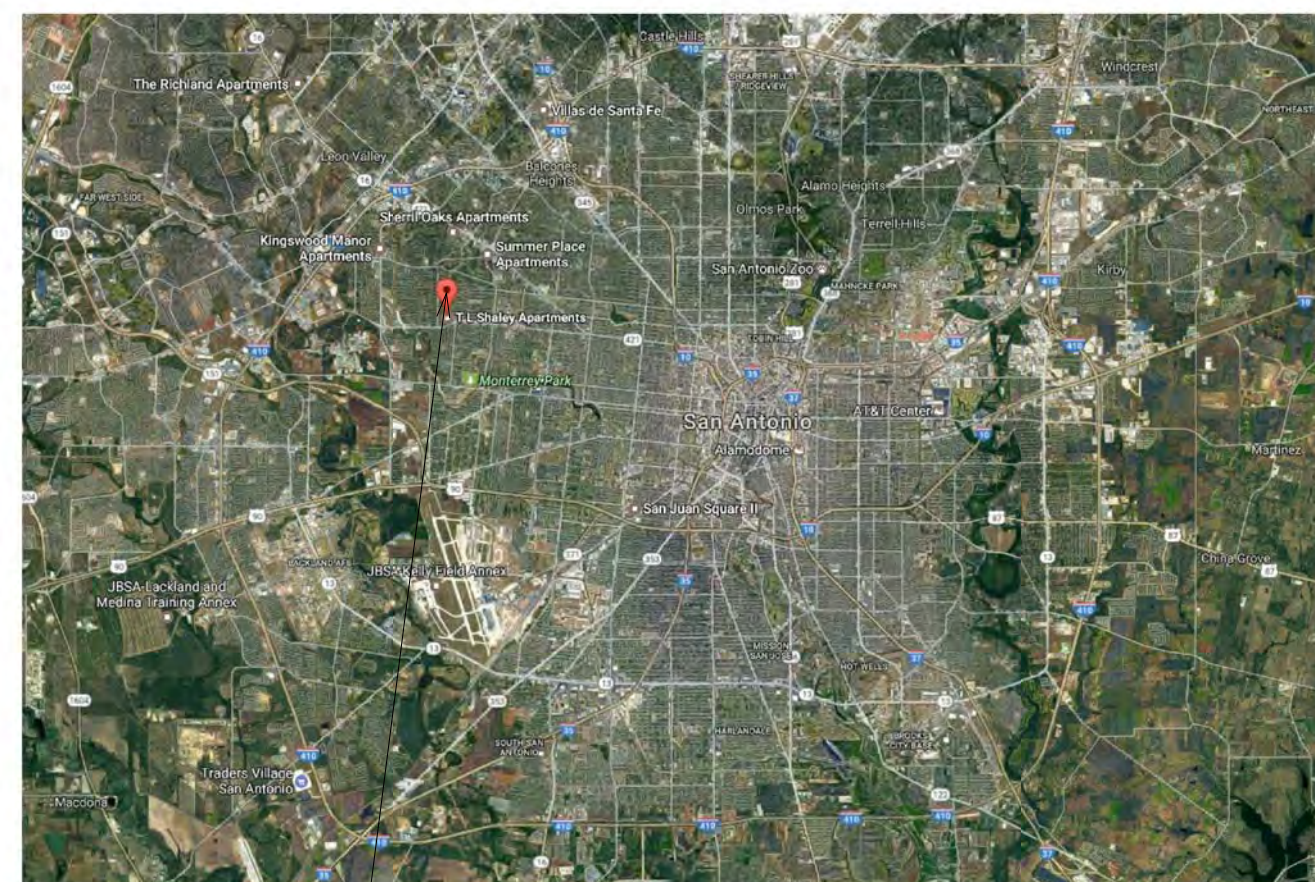
CODE INFORMATION

FUNCTION	SQUARE FEET
APARTMENT RESTORATION (TYPE V-B CONSTRUCTION)	
APARTMENT RESTORATION	1,750 SF
TOTAL SQUARE FOOTAGE:	1,750 SF

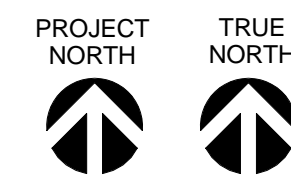
OCCUPANCY CLASSIFICATION	
GROUP:	R-RESIDENTIAL
CONSTRUCTION TYPE:	V-B, 1 STORY
SPRINKLERED:	NOT SPRINKLERED

CODES	
2015 INTERNATIONAL BUILDING CODE WITH SAN ANTONIO AMENDMENTS	
2015 INTERNATIONAL FIRE CODE WITH SAN ANTONIO AMENDMENTS	
2015 INTERNATIONAL ENERGY CONSERVATION CODE	
2015 INTERNATIONAL PLUMBING CODE WITH SAN ANTONIO AMENDMENTS	
2015 INTERNATIONAL MECHANICAL CODE WITH SAN ANTONIO AMENDMENTS	
2014 NATIONAL ELECTRIC CODE WITH SAN ANTONIO AMENDMENTS	

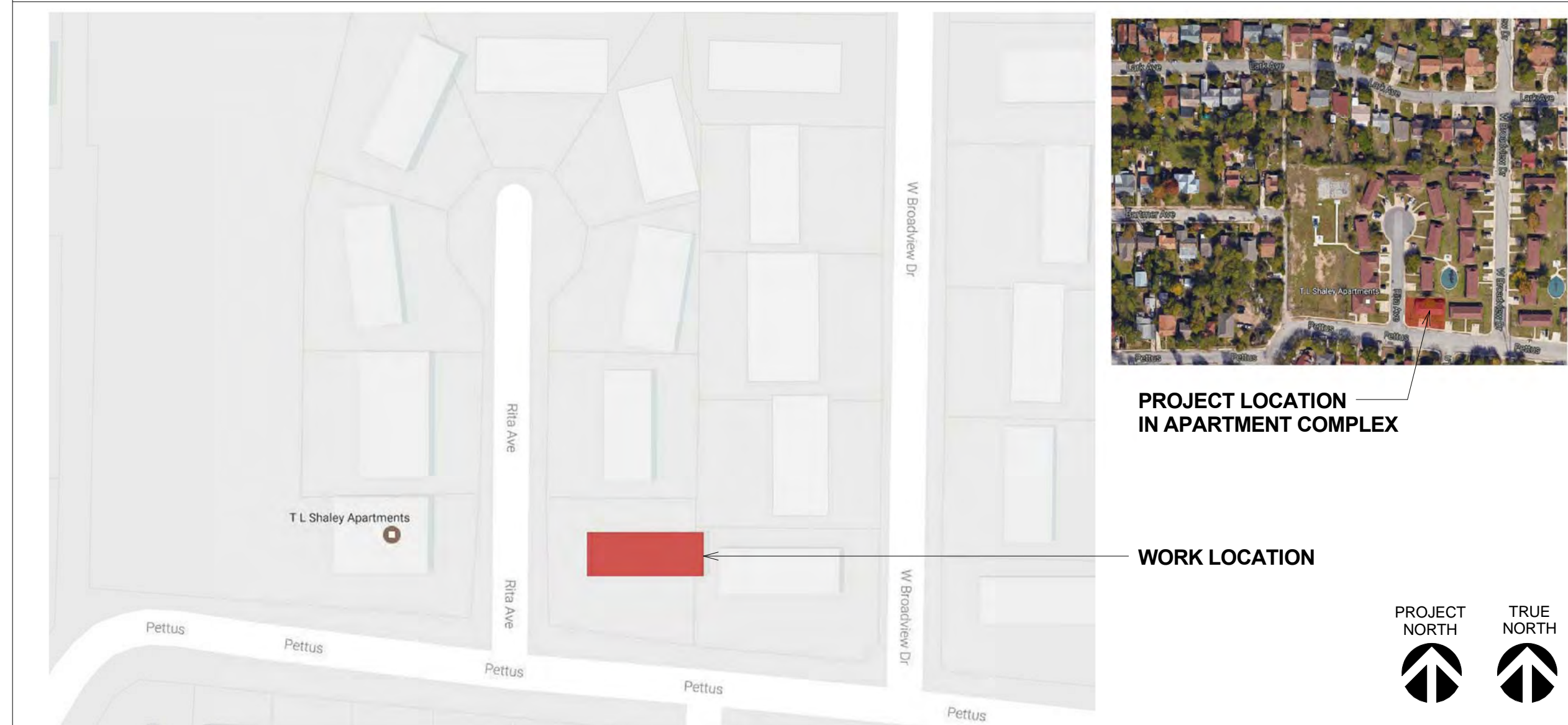
LOCATION MAP



SITE LOCATION

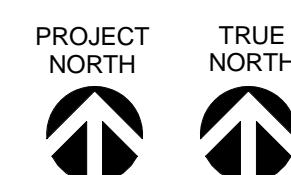


SCOPE OF WORK



PROJECT LOCATION
IN APARTMENT COMPLEX

WORK LOCATION



SAN ANTONIO HOUSING AUTHORITY

President & CEO
David Nisivoccia

COMMISSIONERS

Morris A. Stribling, DPM, Chairman
Charles Munoz, Vice-Chairman
Tommy Adkisson
Francesca Caballero
Charles Clack
Maria R. McClure
Jessica Weaver

GENERAL NOTES

- THIS SET OF CONSTRUCTION DOCUMENTS IS PRESENTED TO INCLUDE DRAWINGS OF 24" x 36" SHEETS & A SEPARATELY BOUND SET OF SPECIFICATIONS.
- NEW PARTITIONS SHALL BE MADE OF WOOD STUDS, SIZE AS INDICATED. REFER TO SPECIFICATIONS.
- UNLESS NOTED OTHERWISE, ELEC. CONDUIT, PLUMBING, ETC. SHALL BE RUN CONCEALED AND FRAMING SHALL BE OF ADEQUATE DIMENSION TO ACCOMPLISH THIS RESULT WITHOUT CHANGES IN THE WALL PLANE.
- WHEN REFERENCE IS MADE TO A MATERIAL SYSTEM, ALL PARTS AND MATERIALS PERTINENT TO THE MANUFACTURER'S SYSTEM SPECIFIED SHALL BE FURNISHED AND INSTALLED.
- ALL INFORMATION ON EXISTING CONDITIONS WAS SUPPLIED TO DURAND-HOLLIS RUPE ARCHITECTS BY THE OWNER. CONTRACTOR IS REQUESTED TO VERIFY, ON-SITE, ALL DIMENSIONS & CONDITIONS BEFORE STARTING CONSTRUCTION. REPORT ANY DISCREPANCIES IMMEDIATELY TO DURAND-HOLLIS RUPE ARCHITECTS. CONTRACTOR SHALL FAMILIARIZE HIM (HER) SELF WITH EXISTING CONDITIONS PRIOR TO COMMENCING CONSTRUCTION.
- WORK CONTAINED IN THESE PLANS AND SPECIFICATIONS RELATE TO NEW FLOOR, WALLS, DOORS, FRAMES, CLG., ETC. FINISHES AS SCHEDULED OR NOTED.
- REPAIR ANY DAMAGED WALL PRIOR TO APPLYING FINISHES.
- CONTRACTOR TO PROVIDE AND INSTALL, R-19 BATTS INSULATION ON ALL EXTERIOR WALLS, ABOVE WINDOWS, FASTEN AS SPEC'D BY MANUFACTURER.
- IN THE EVENT OF CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS, THE GREATER AMOUNT OF WORK SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ARCHITECT AND REQUEST DIRECTION.
- THE CONTRACT DOCUMENTS ARE COMPLIMENTARY, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. ALL CONTRACT DOCUMENTS - ARCHITECTURAL AND ENGINEERING - ARE TO BE USED TOGETHER. GENERAL CONTRACTOR AND SUBCONTRACTORS ARE RESPONSIBLE TO REVIEW COMPLETE SETS OF DOCUMENTS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO THE START OF CONSTRUCTION.
- FOR ANY ITEM IDENTIFIED IN THE CONTRACT DOCUMENTS THAT IS REASONABLY INFERRABLE AS A COMPONENT IN A SYSTEM AND REQUIRED FOR THE PERFORMANCE OF THAT SYSTEM, THE GENERAL CONTRACTOR SHALL INCLUDE ALL OTHER COMPONENTS IN THE WORK WHICH ARE NECESSARY FOR THE PROPER EXECUTION AND OPERATIONAL PERFORMANCE OF THAT SYSTEM.
- THE CONTRACT DOCUMENTS INDICATE THE GENERAL DESIGN INTENT, BUT DO NOT NECESSARILY DESCRIBE ALL WORK REQUIRED FOR FULL PERFORMANCE AND COMPLETION. THE CONTRACTOR SHALL PROVIDE ALL ITEMS REQUIRED FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.
- CONTRACTOR OF THE WORK SHALL VERIFY IN THE FIELD AND COORDINATE BETWEEN THE TRADES. ALL CONDITIONS BOTH NEW AND EXISTING WHICH AFFECT WORK TO BE DONE OR RELEVANT THERETO, INCLUDING, BUT NOT LIMITED TO, PROPERTY LINE DIMENSIONS, SETBACKS, EASEMENTS, RESTRICTIONS, EXACT LOCATIONS OF ALL CONSTRUCTION, EXISTING AND NEW, EXISTENCE AND LOCATIONS OF ASBESTOS OR OTHER UNKNOWN TOXIC MATERIAL, DRIVEWAYS, WALKS, APRONS, UTILITIES, GRADES, AND DRAINAGE. THE CONTRACTOR IS RESPONSIBLE FOR THE DISCOVERY OF ASBESTOS AND OTHER REGULATED TOXIC MATERIALS AND SHALL BEAR ADMINISTRATIVE RESPONSIBILITY FOR CONFORMANCE TO FEDERAL, STATE, AND LOCAL JURISDICTIONAL REQUIREMENTS REGARDING THE DISPOSITION OF HAZARDOUS MATERIALS. SHOULD ANY QUESTIONS ARISE PRIOR TO BEGINNING CONSTRUCTION OR DURING ANY PHASE OF CONSTRUCTION, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT FOR REVIEW AND CLARIFICATION BEFORE PROCEEDING WITH THAT PORTION OF THE WORK OR ANY PART RELATED THERETO.
- CONTRACTOR SHALL OBTAIN AND BE RESPONSIBLE FOR ALL FEES AND PERMITS REQUIRED AND ASSOCIATED WITH ALL PHASES OF THE WORK AND WITHIN SCOPE OF THE CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO BUILDING PERMIT FEES, WATER AND SEWER FEES, DRIVEWAY AND SIDEWALK FEES, ETC. THE LOCATION OF UTILITIES SHOWN ON THE SITE PLANS ARE BASED ON THE BEST INFORMATION AVAILABLE. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL UTILITIES BEFORE STARTING CONSTRUCTION. CONTRACTOR WILL ENSURE ALL SEWER LINES ARE FREE OF OBSTRUCTIONS AND DRAINING PROPERLY AND FREE OF ANY LEAKS. (CONTRACTOR TO PERFORM HYDROSTATIC TEST BEFORE AND AFTER THE WORK).

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SYMBOLS LEGEND

? A.F.F.	CEILING HEIGHT TAG	?	WINDOW MARK	?	CALLOUT
?	REVISION TAG	?	WALL TYPE	?	COLUMN MARK
?	VIEW TITLE BLOCK	?	DOOR NUMBER	?	SECTION
?	BUILDING ELEVATION	?	KEYNOTE	?	ELEVATION LINE
?	INTERIOR ELEVATION	?	ROOM TAG	?	NORTH ARROW

OWNER



ARCHITECT



MEP



HM3 Engineering
2902 N FLORES
SAN ANTONIO, TX 78212
T. 210.393.1840
alfred@hm3engineering.com

STRUCTURAL



DURAND-HOLLIS RUPE ARCHITECTS, INC.
14603 HUEBNER RD.
BUILDING 18
SAN ANTONIO, TEXAS 78230
PHONE: 210.308.0080
FAX: 210.697.3309
eMAIL: office@dhrarchitects.com

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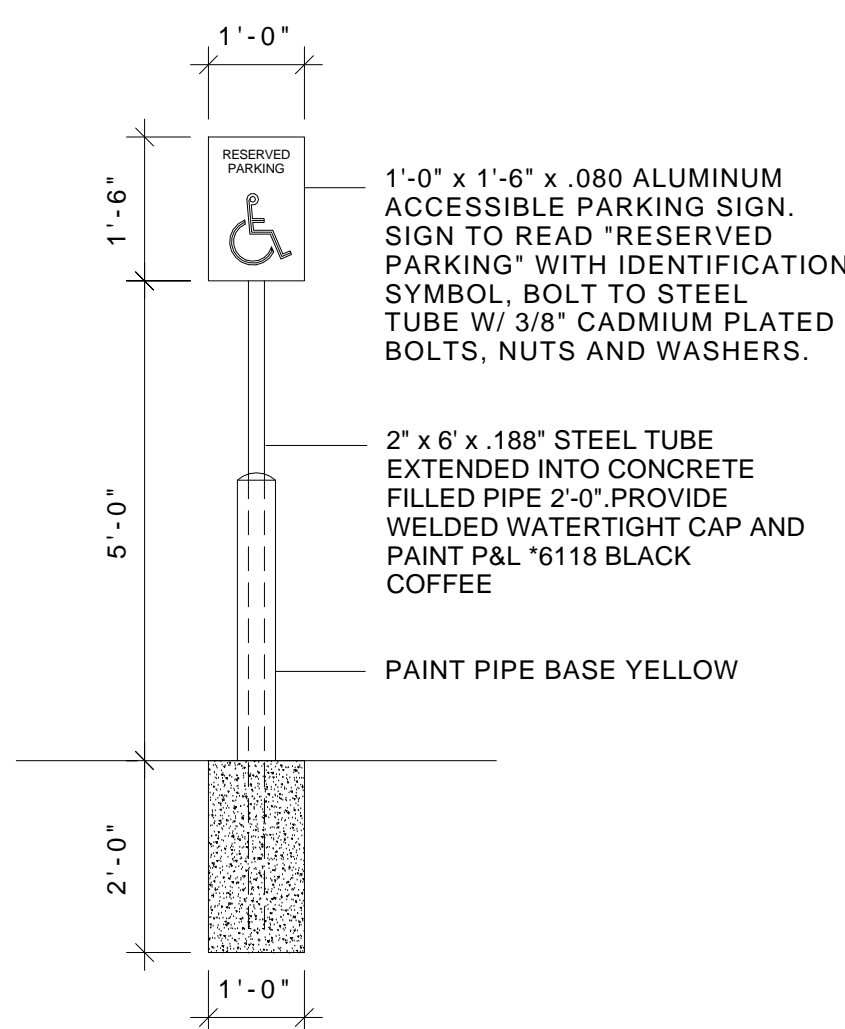
COVER SHEET

PROJECT NO.: 17-019
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DRAWN BY: AVF
REVIEWED BY: JEC
PROJECT ARCHITECT:
GABRIEL DURAND-HOLLIS, FAIA
TEXAS LICENSE NO. 10881

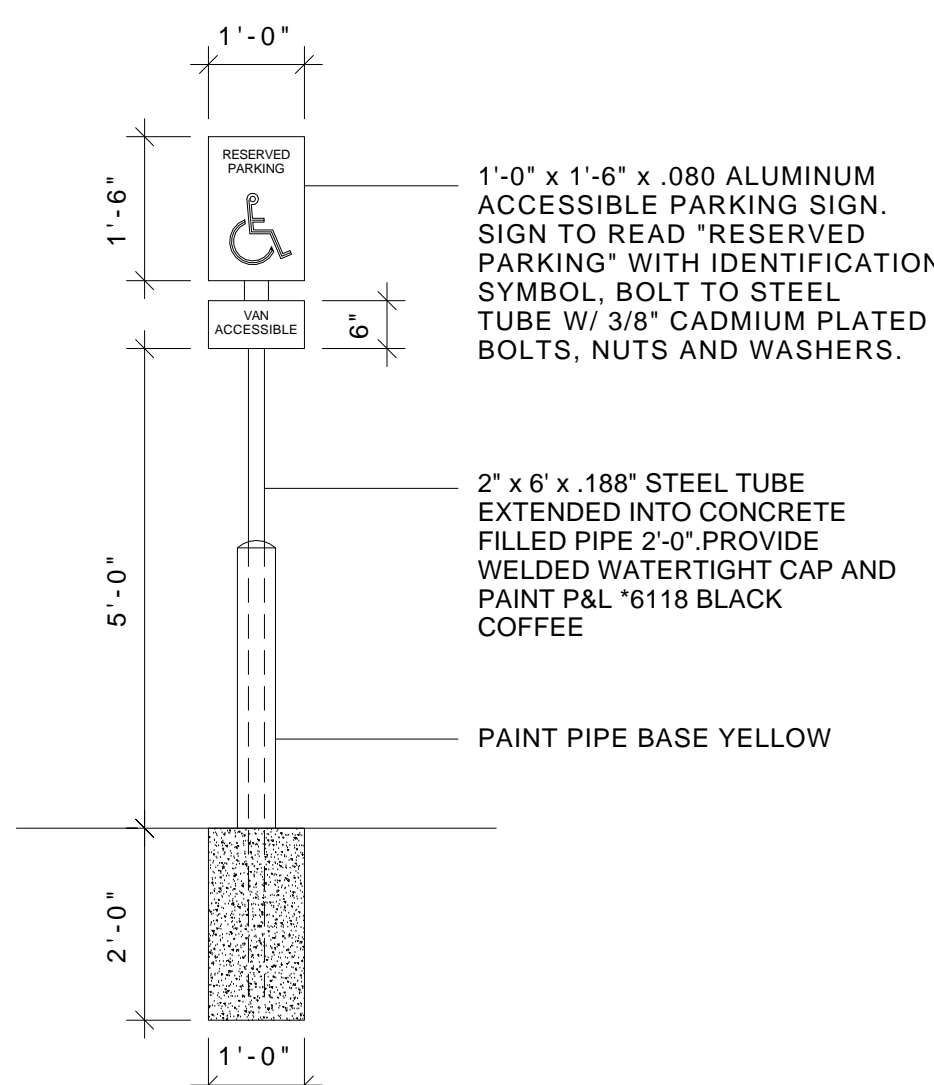
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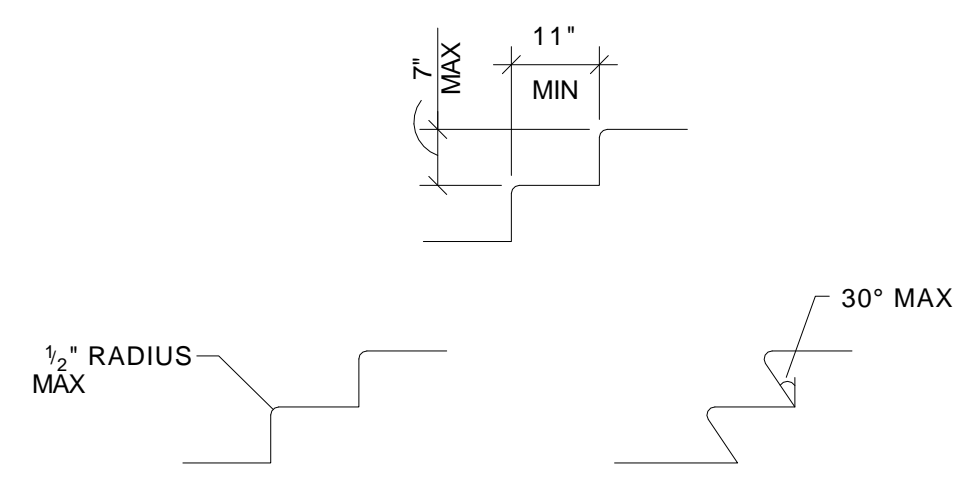
PARKING SIGN



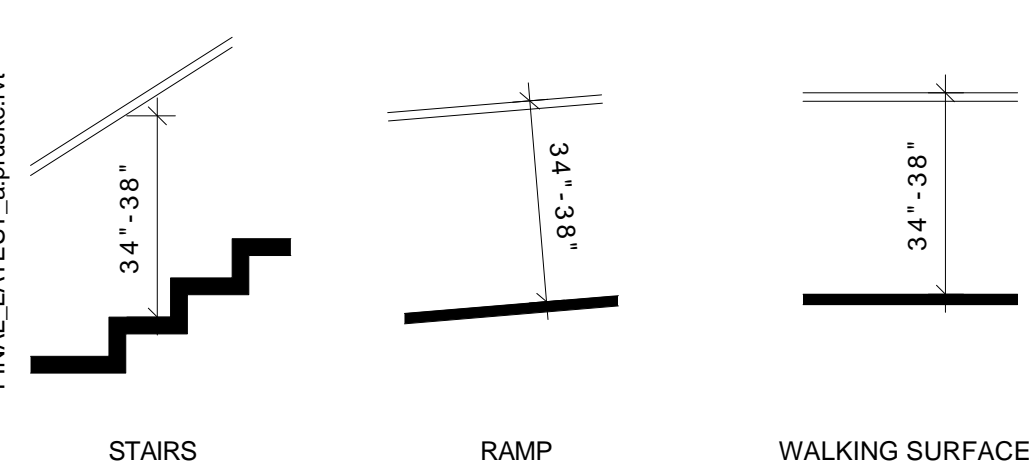
VAN PARKING SIGN



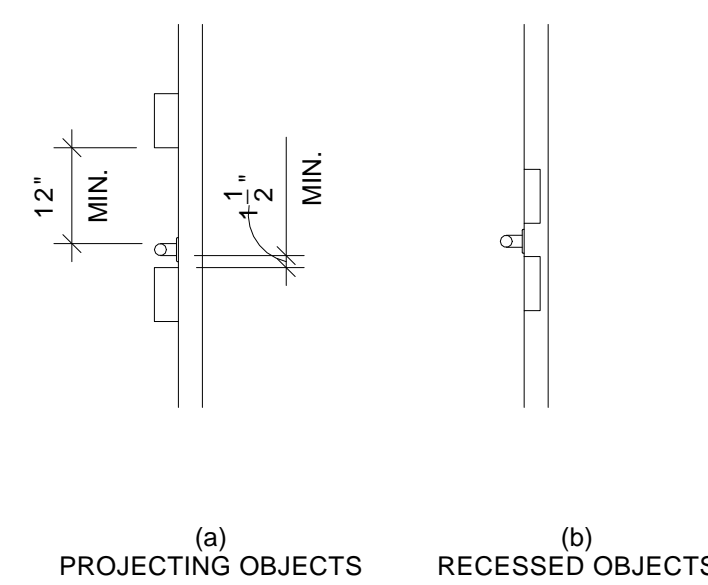
STAIRWAYS



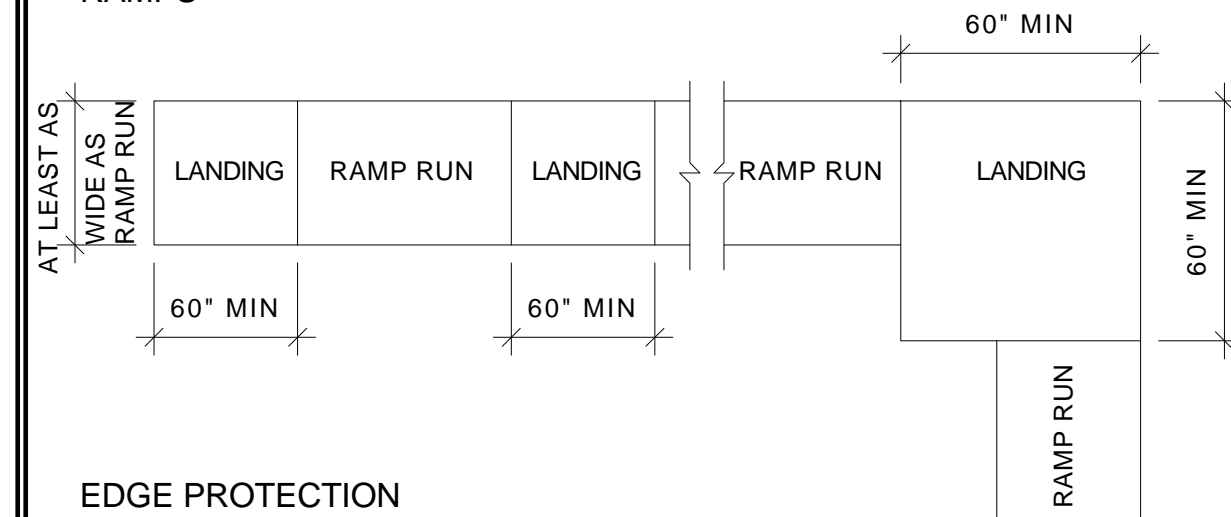
HANDRAILS



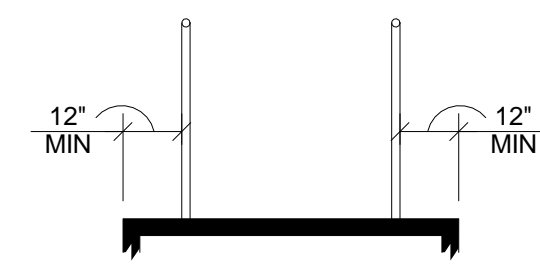
SPACING OF GRAB BARS



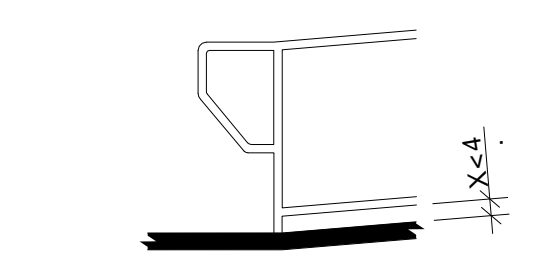
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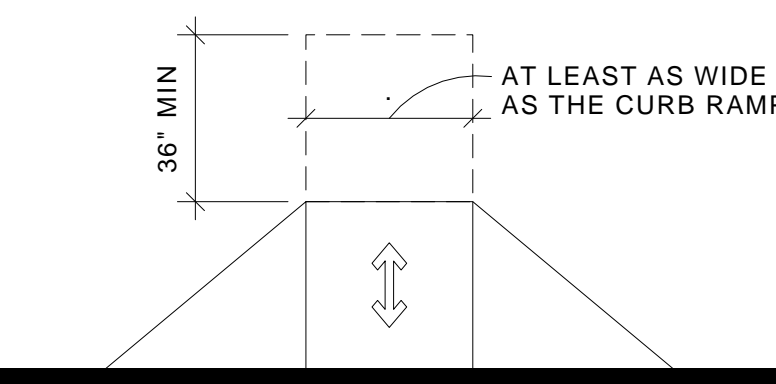
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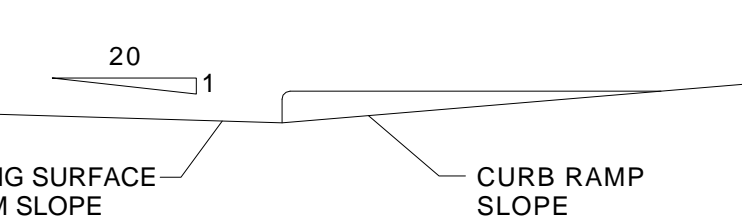
CURB OR BARRIER



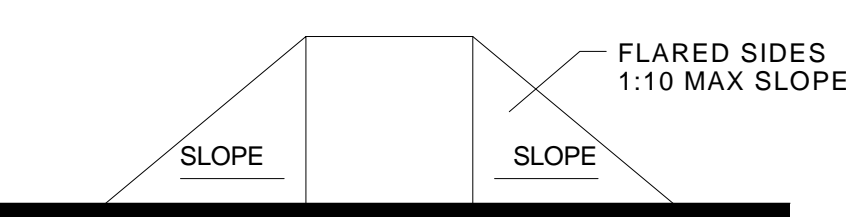
LANDINGS



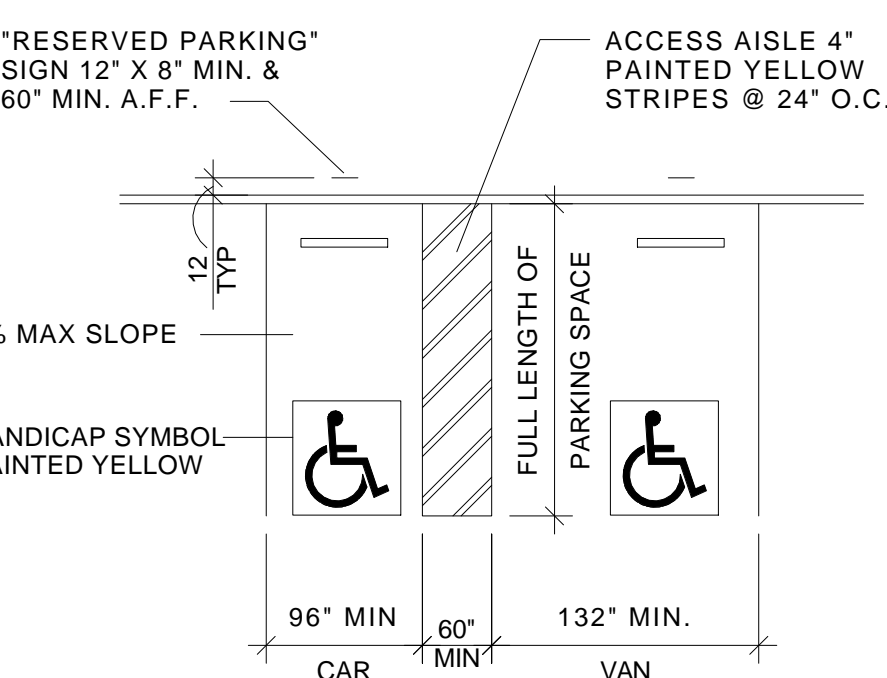
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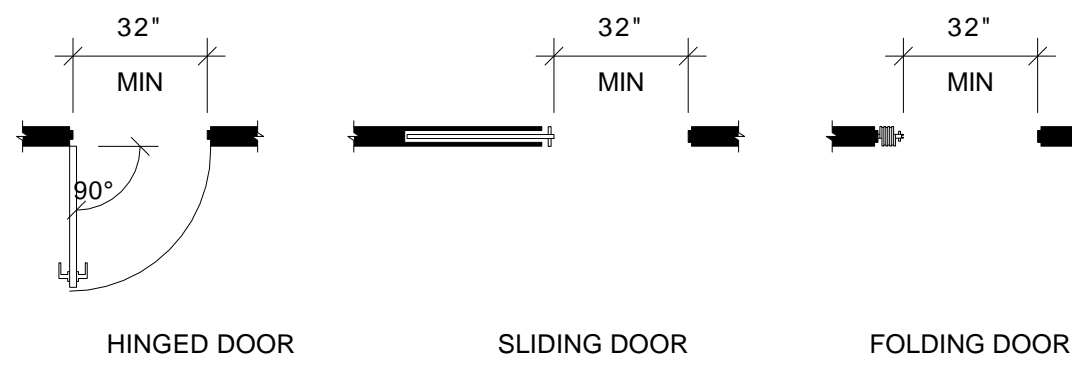
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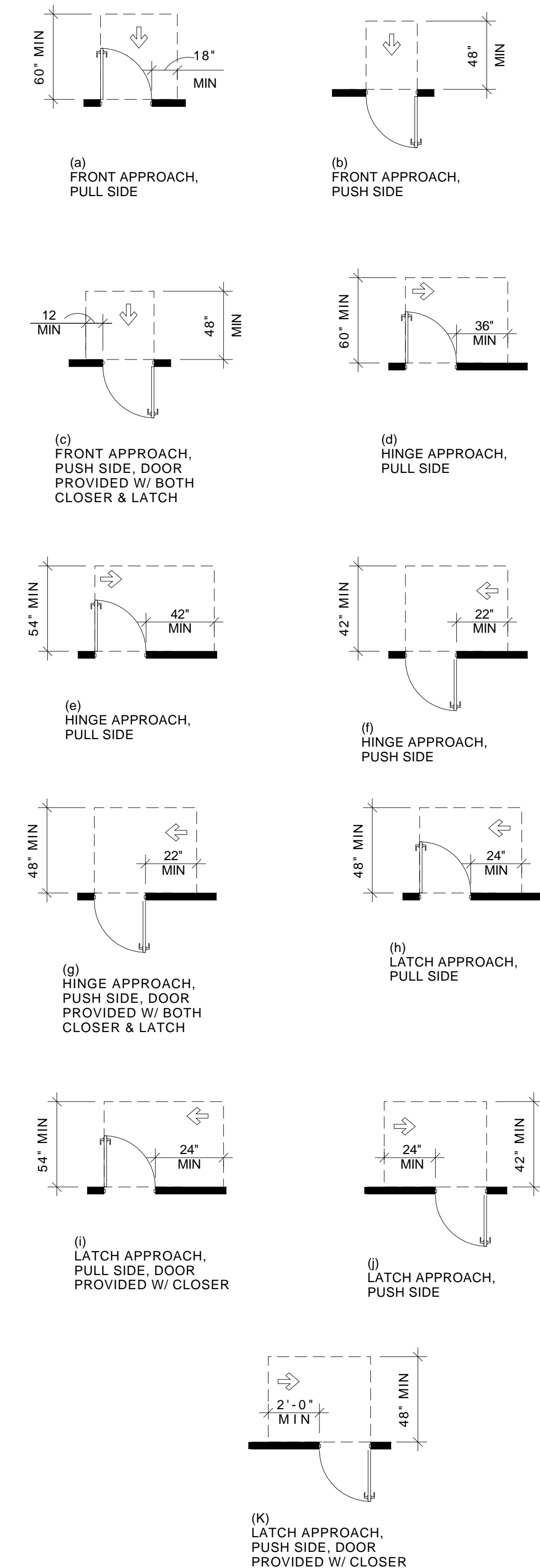
PARKING SPACES



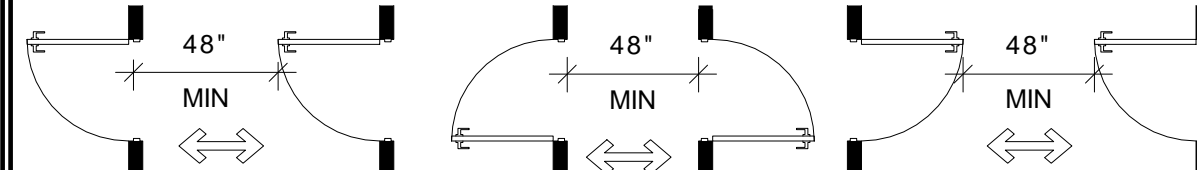
DOORWAYS



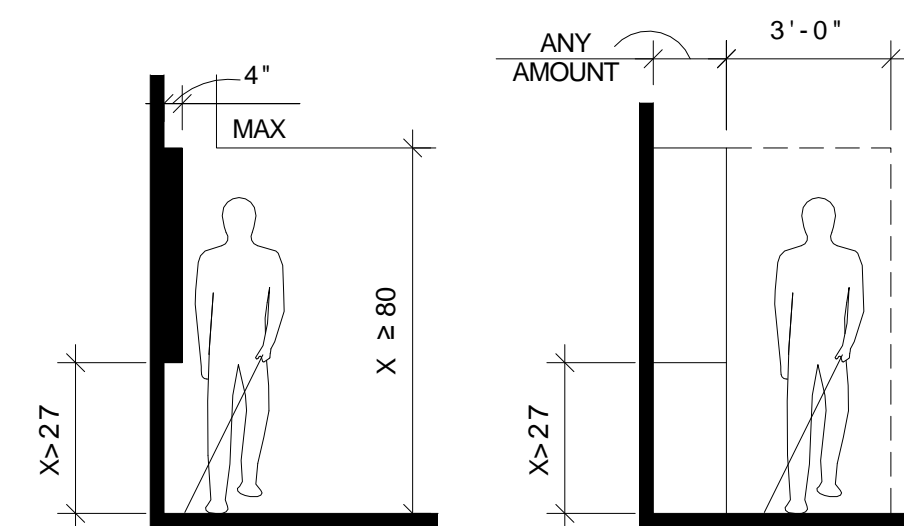
MANEUVERING CLEARANCES



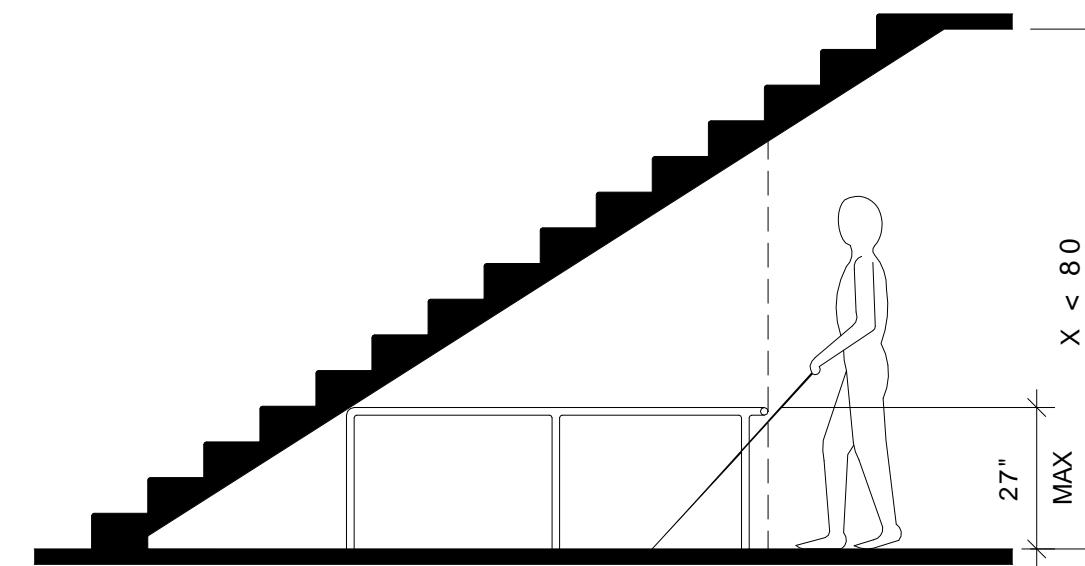
DOORS IN SERIES



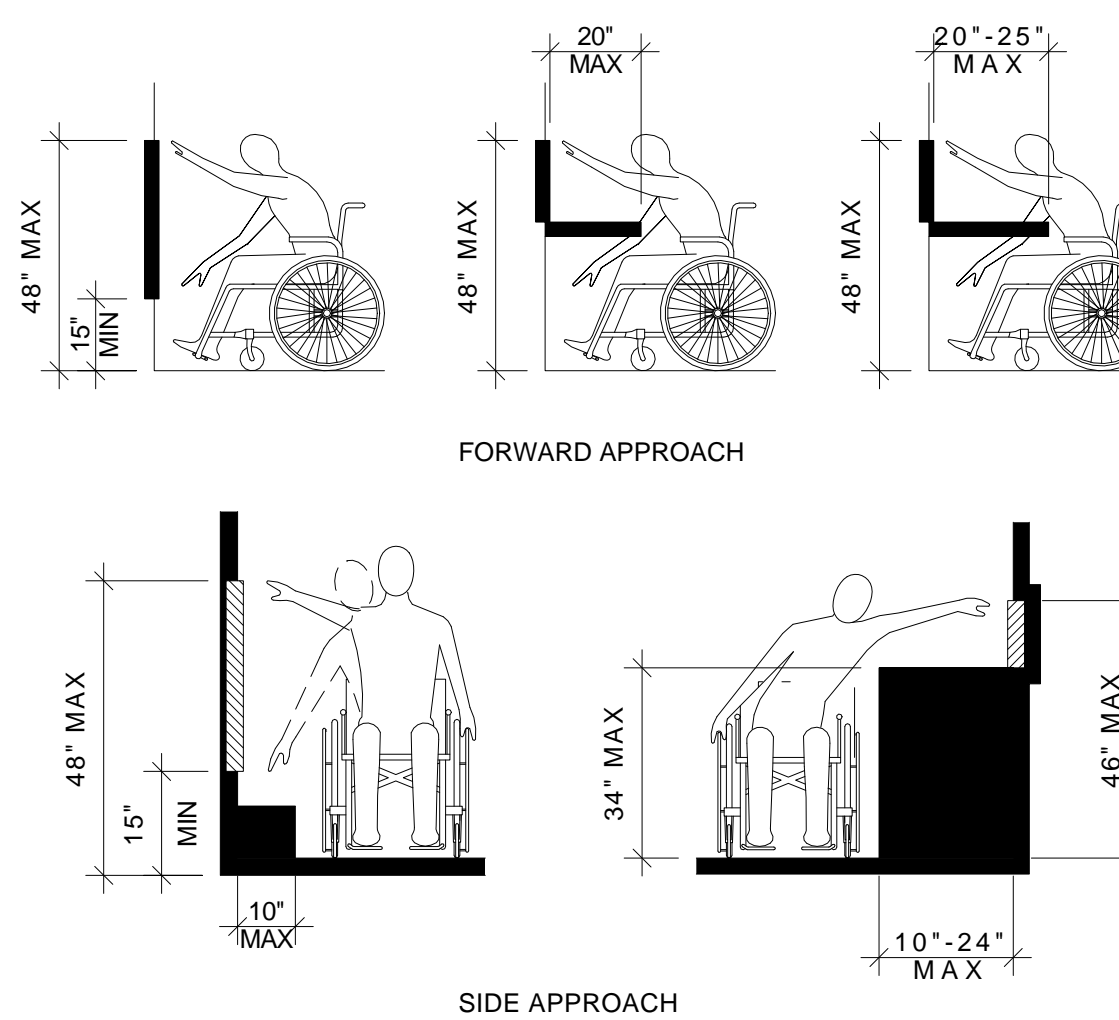
PROTRUDING OBJECTS



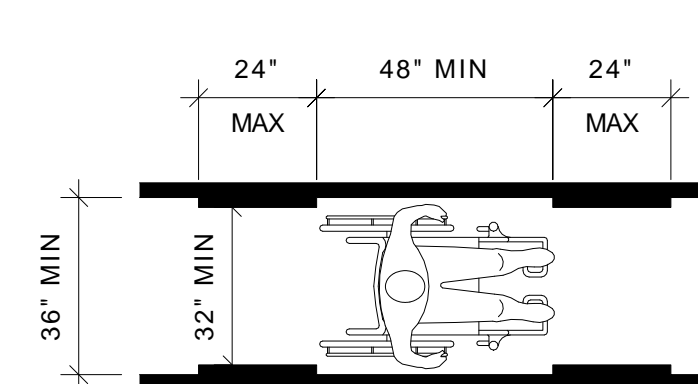
VERTICAL CLEARANCE



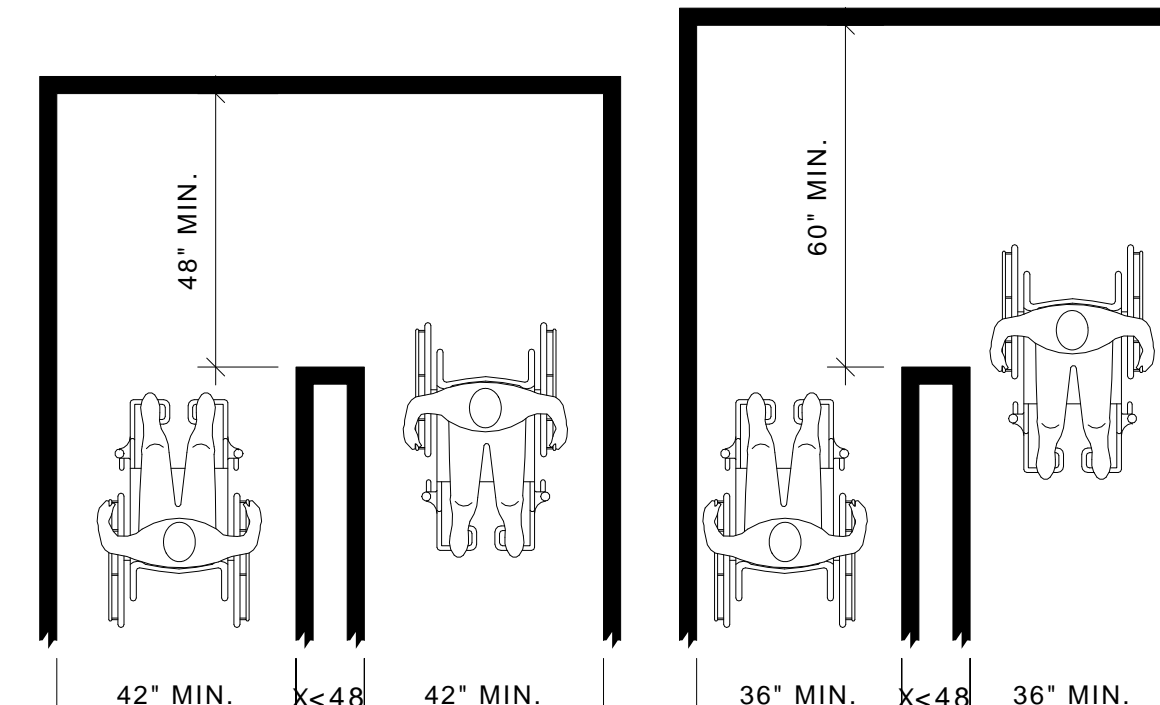
REACH RANGES



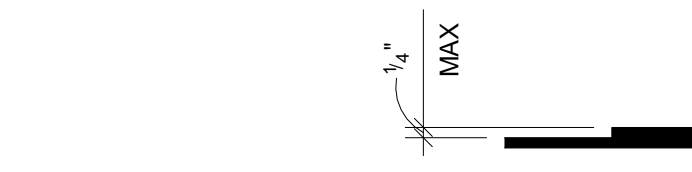
WALKING SURFACES



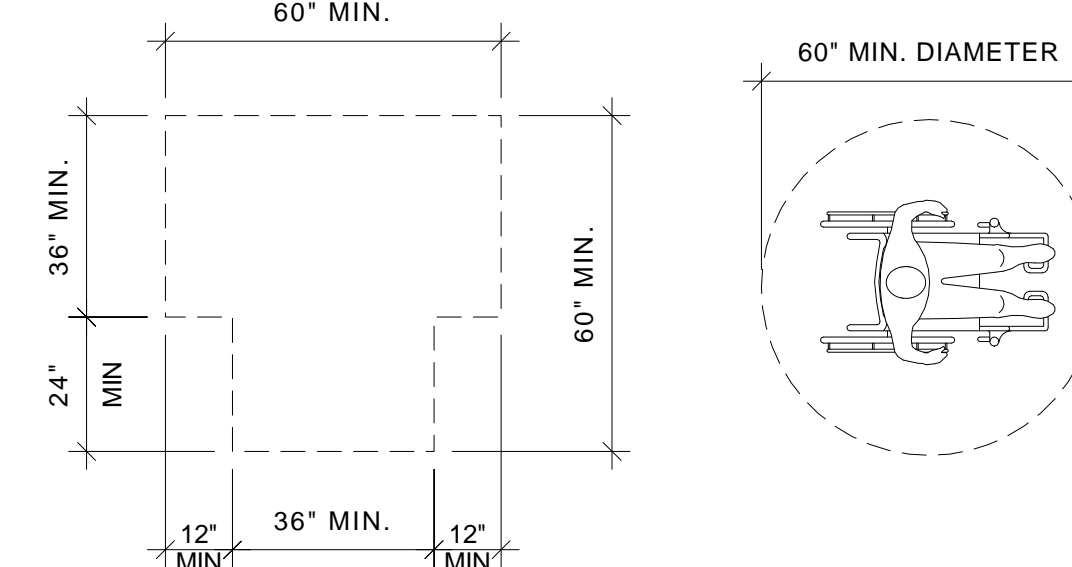
CLEAR WIDTH AND TURN



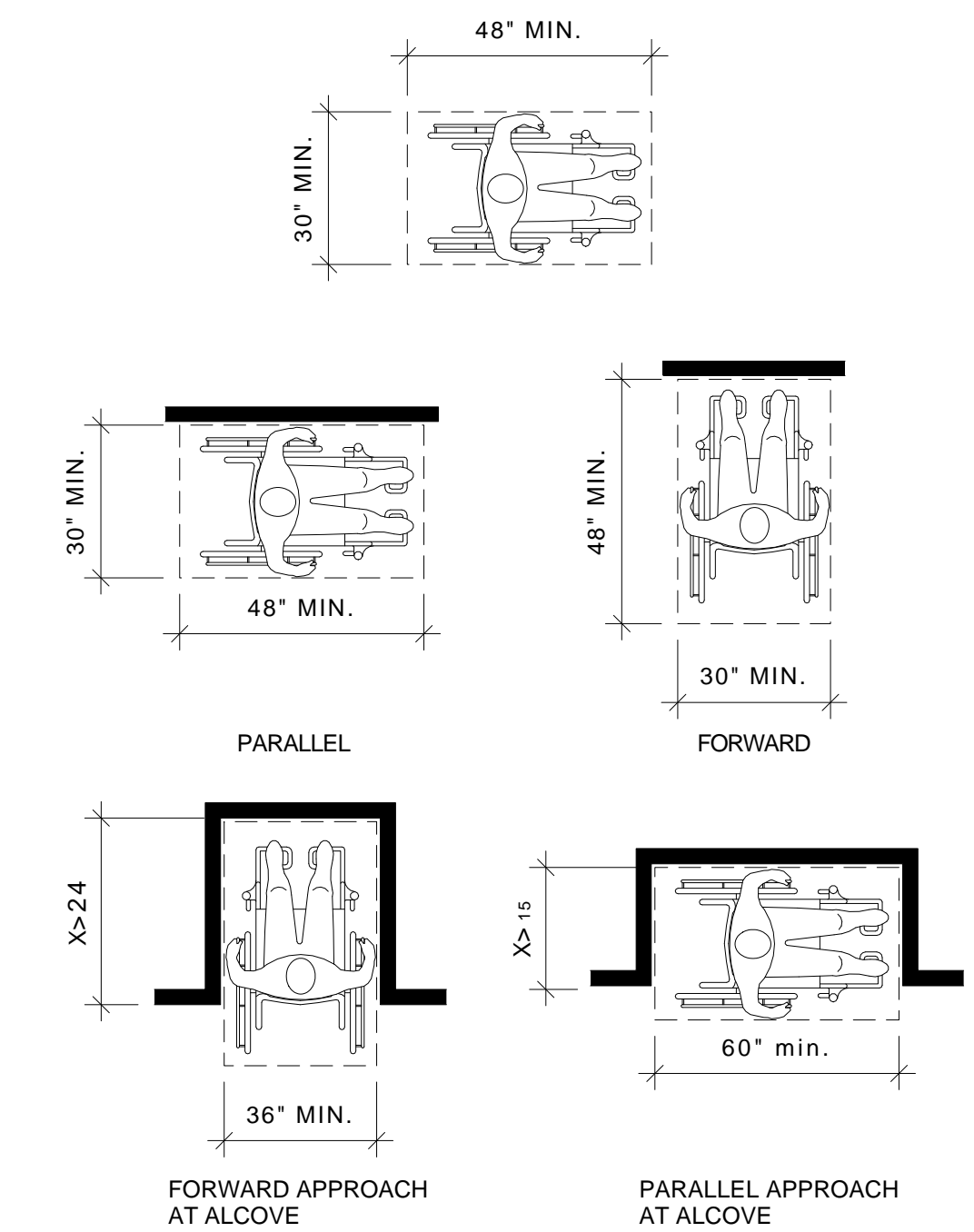
FLOOR OR GROUND SURFACES



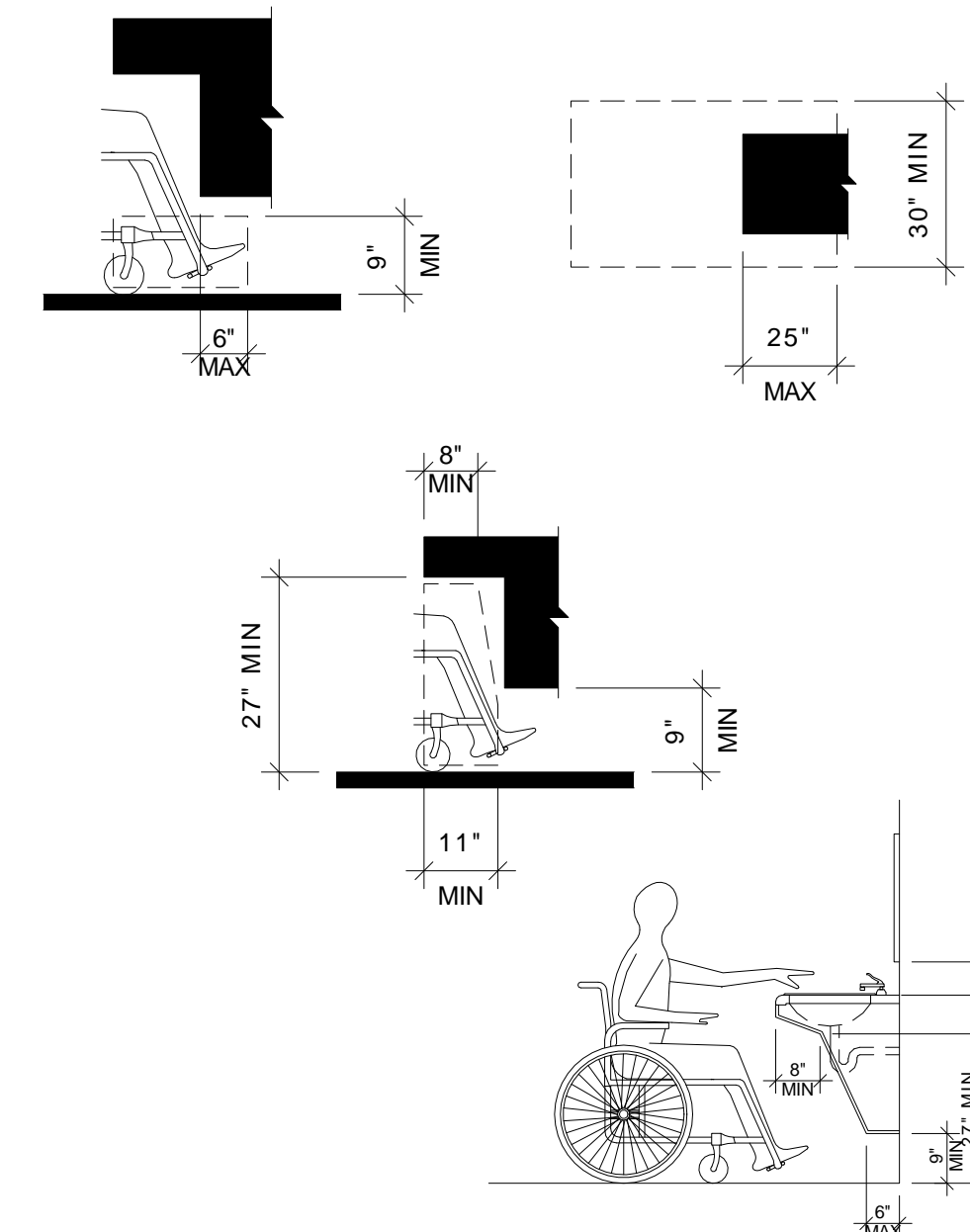
TURNING SPACE



CLEAR FLOOR OR GROUND SPACE



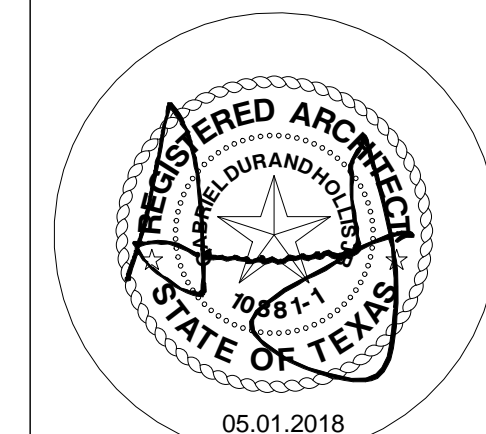
KNEE AND TOE CLEARANCE



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

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 4827 PETTUS, SAN ANTONIO, TX 78228



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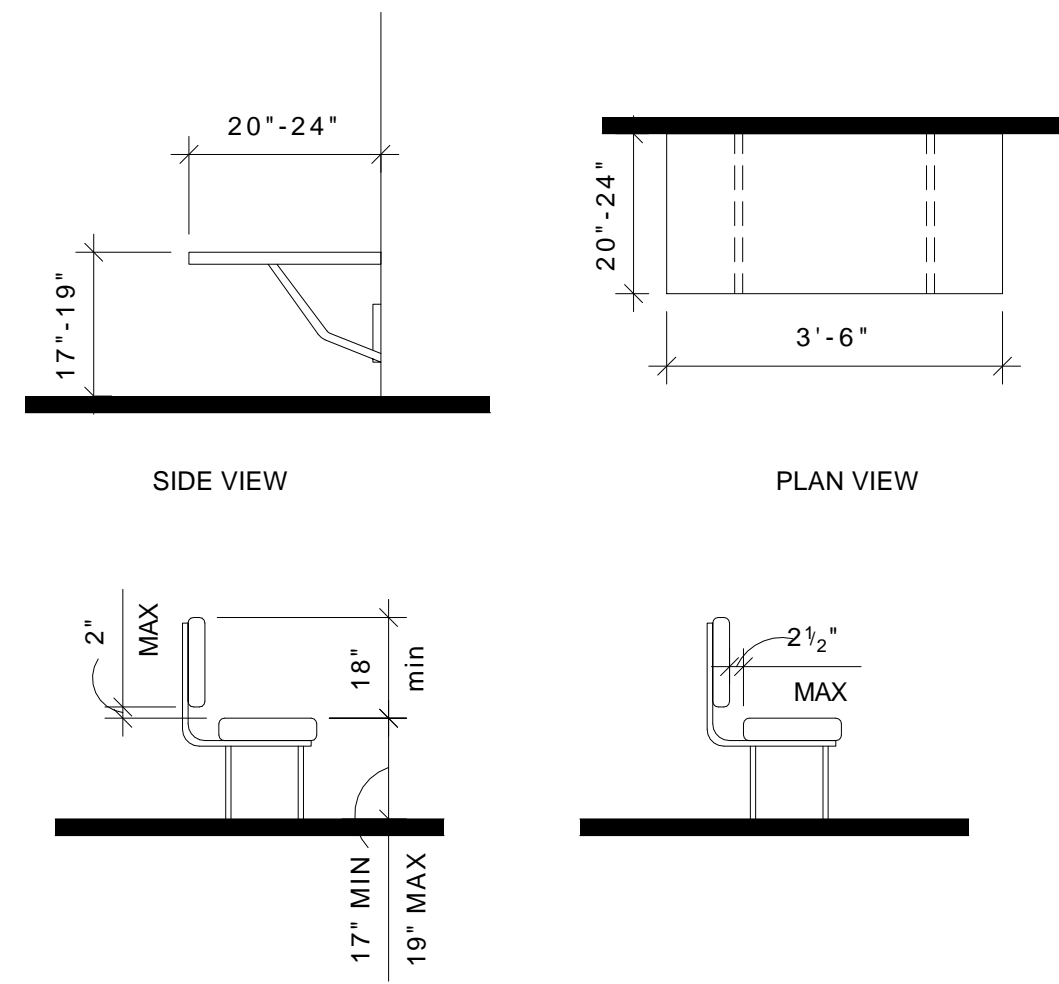
PROJECT NO.: 17-019
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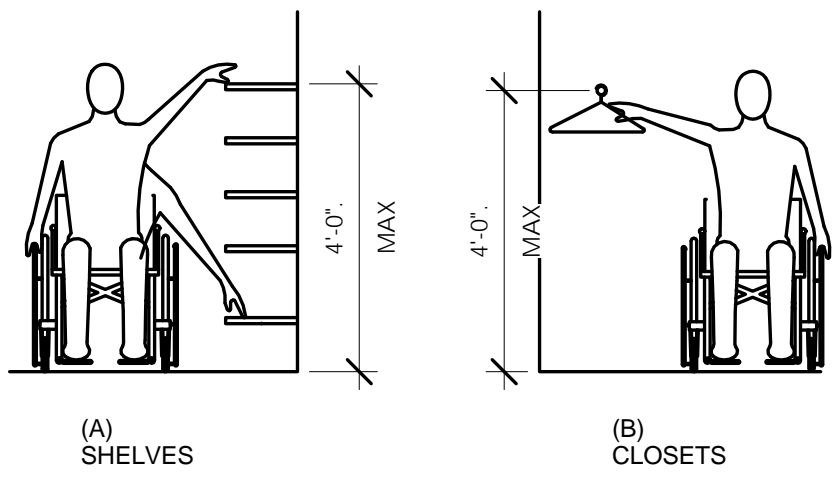
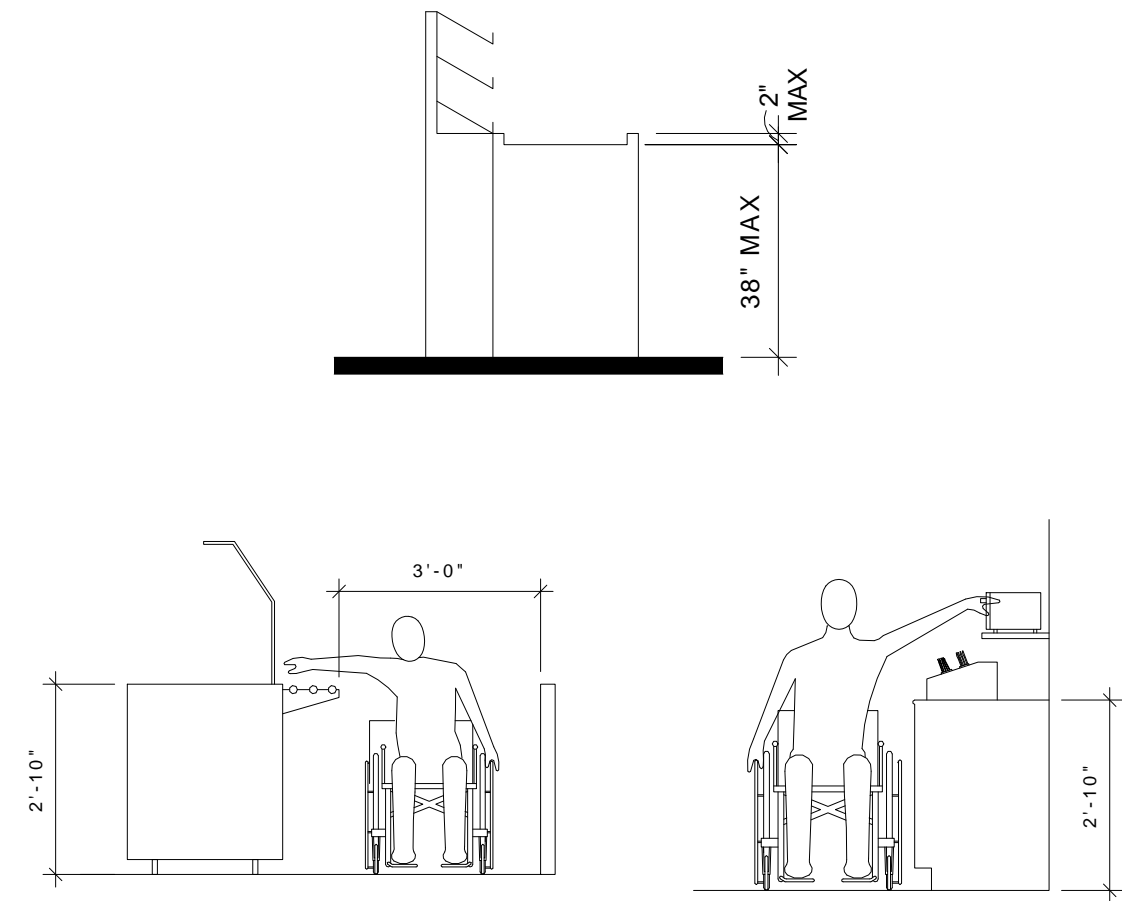
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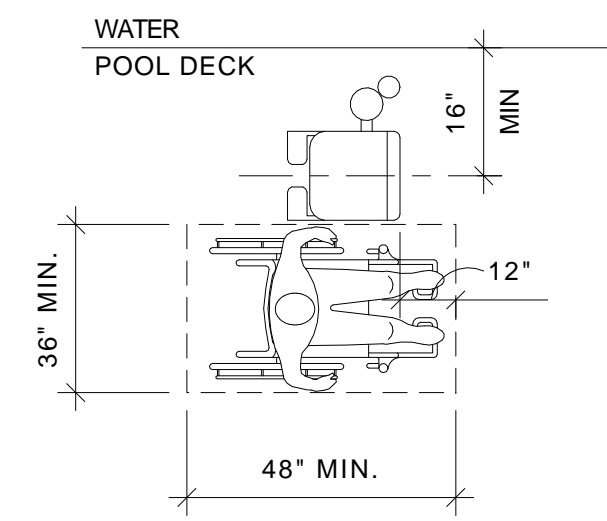
BENCHES



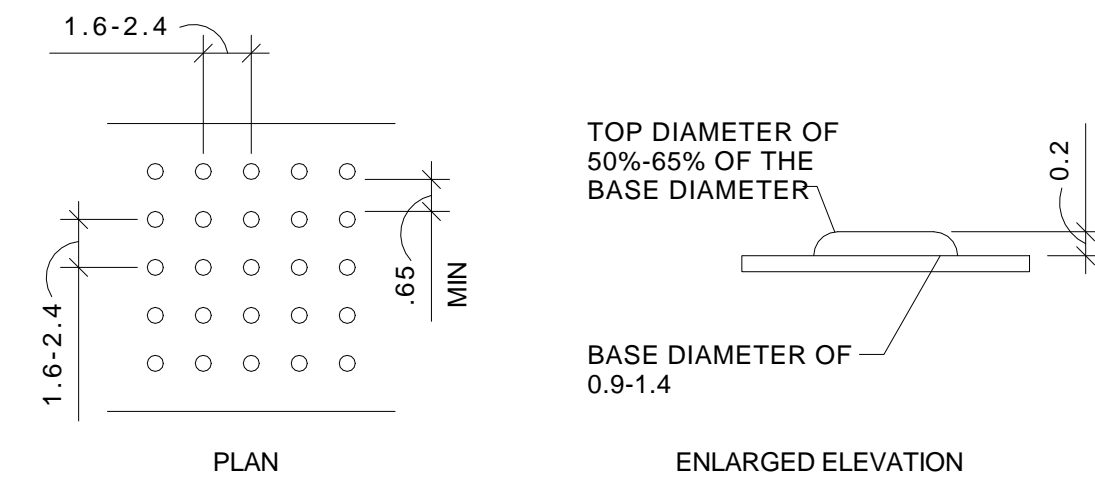
CHECK OUT AISLES AND SALES AND SERVICE COUNTERS



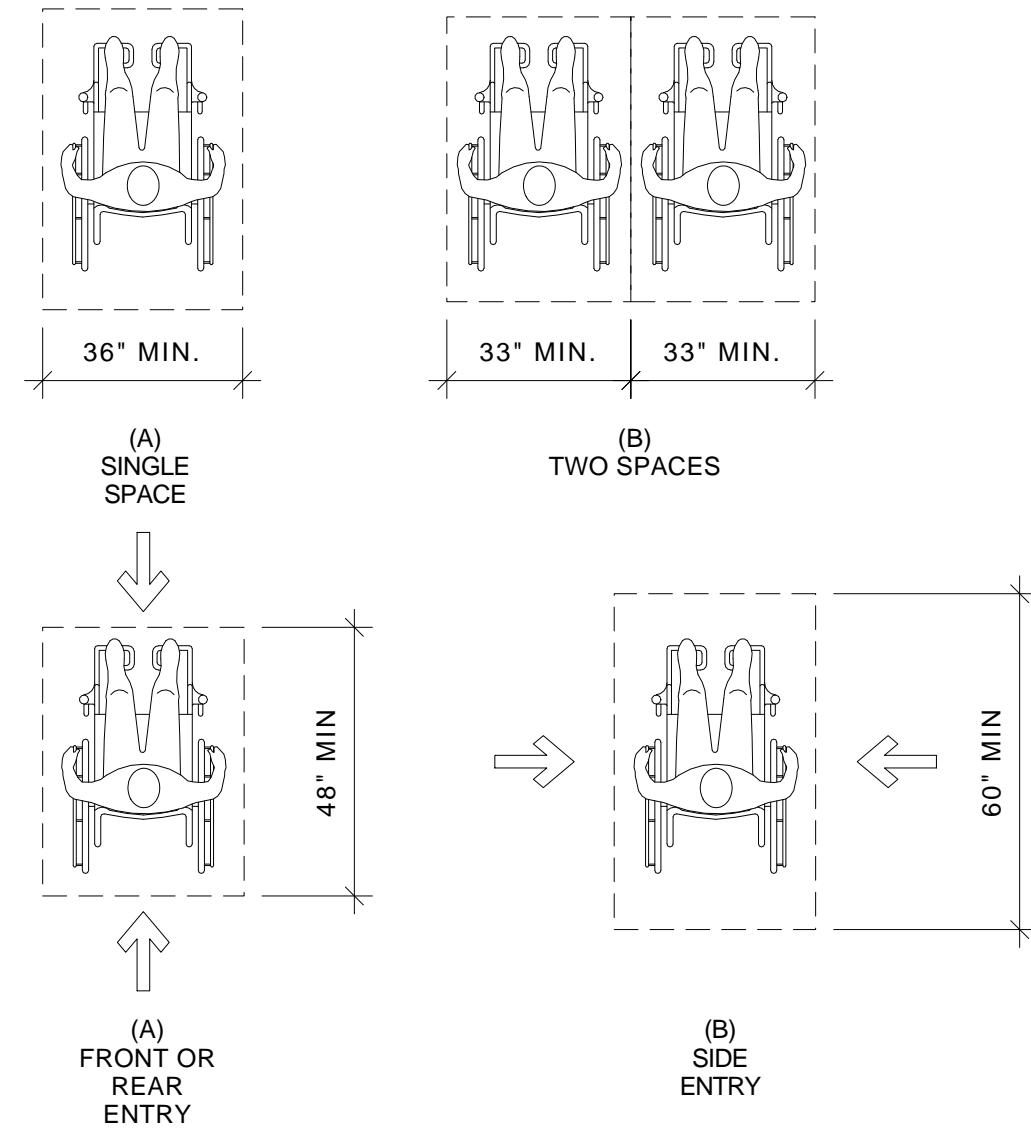
POOL LIFT SEAT LOCATION



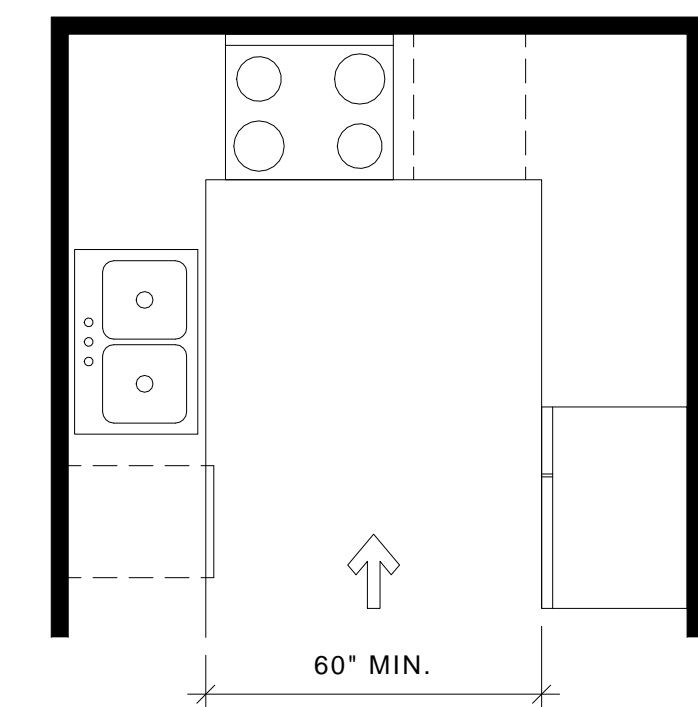
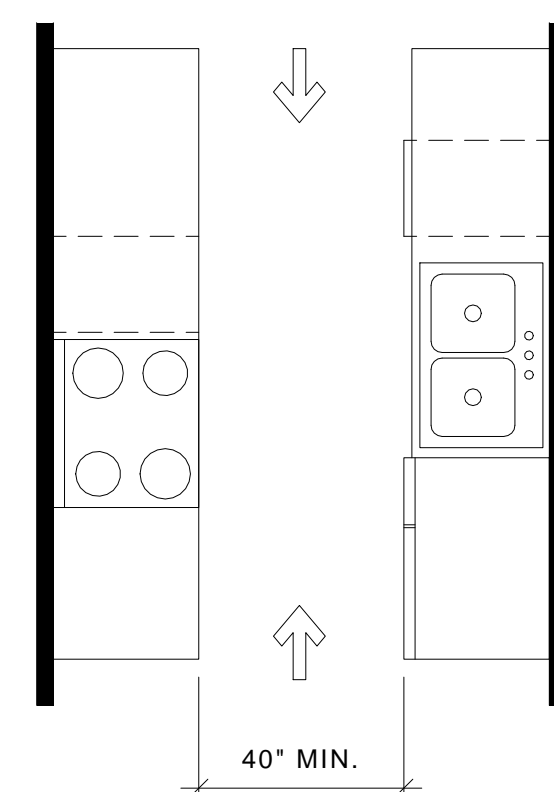
DETECTABLE WARNINGS



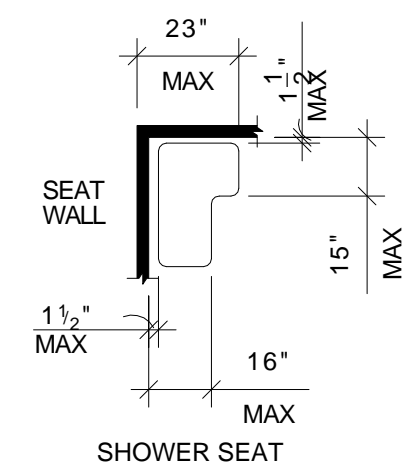
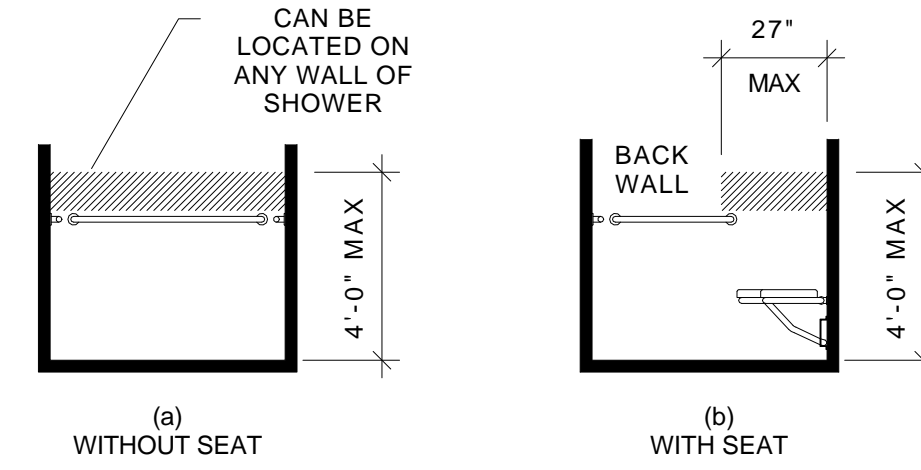
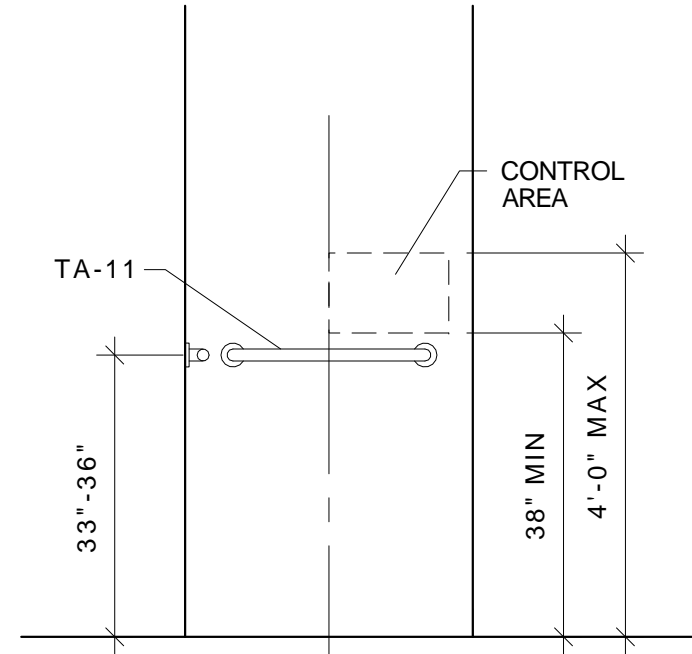
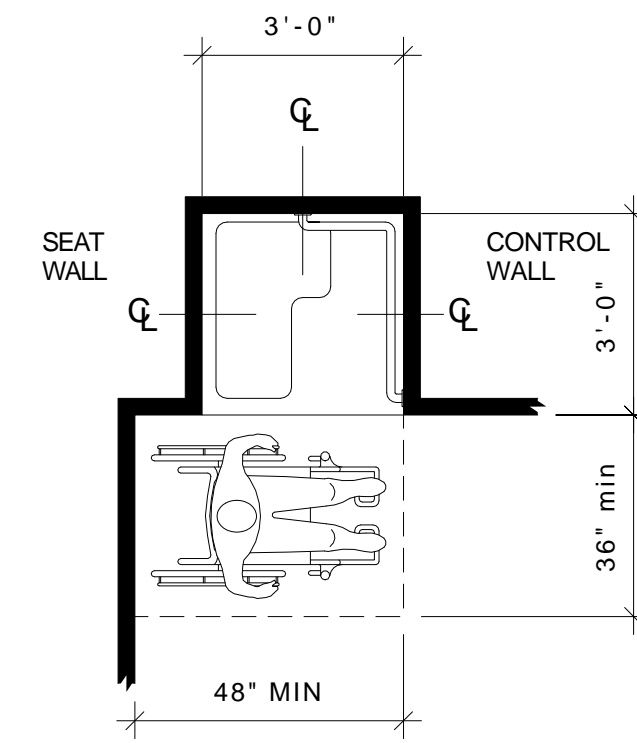
WHEELCHAIR SPACES, COMPANION SEATS, AND DESIGNATED AISLE SEATS



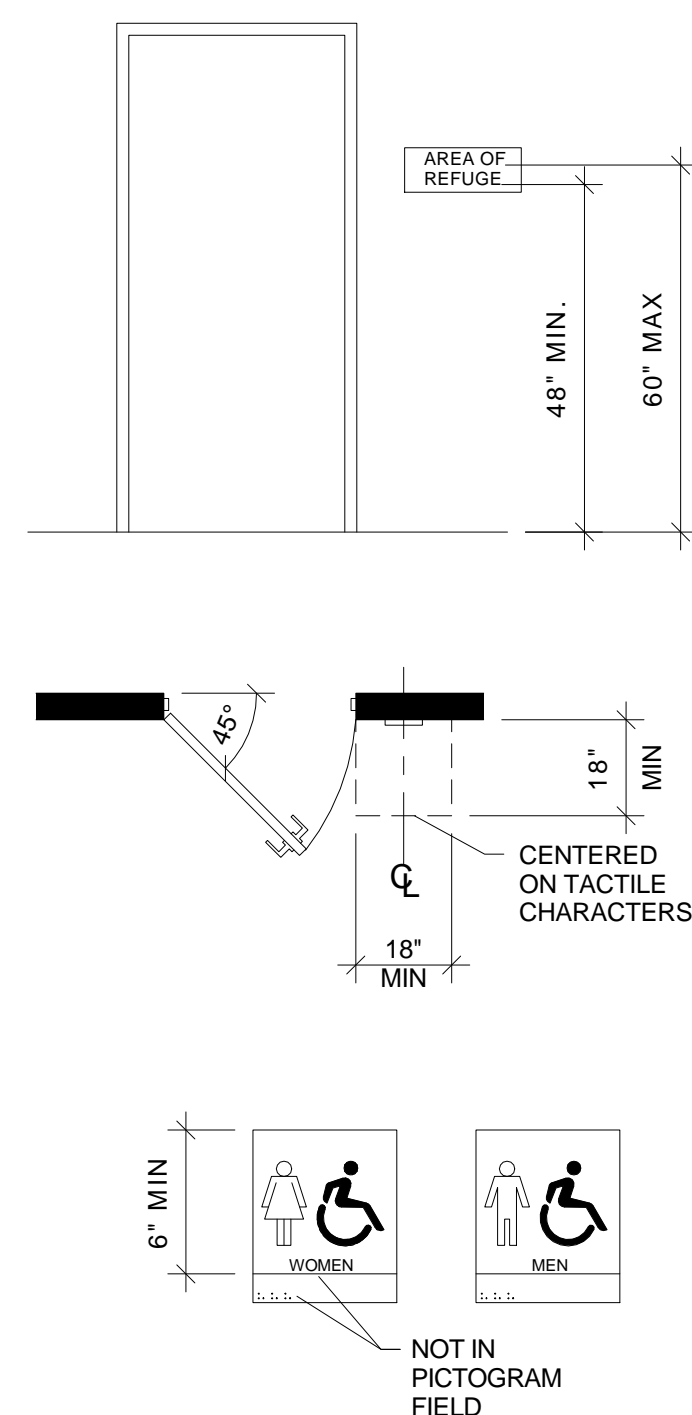
KITCHEN AND KITCHENETS



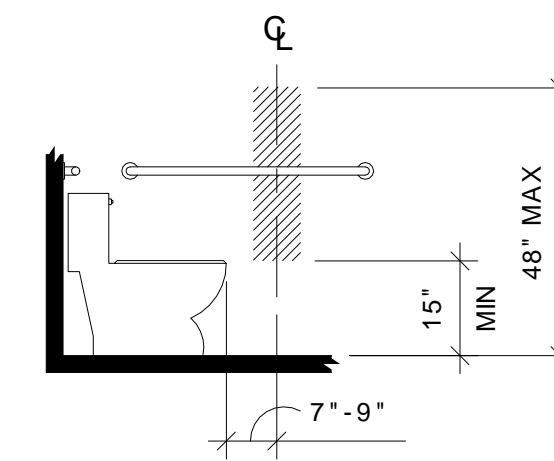
SHOWER COMPARTMENTS



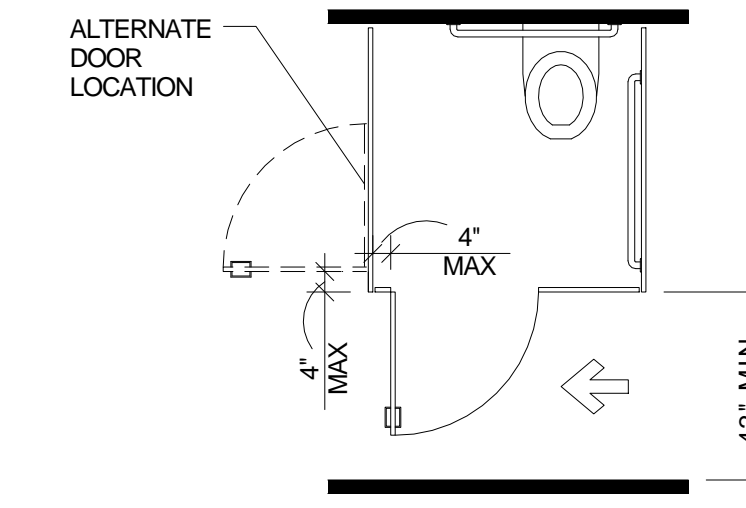
LOCATION OF TACTILE SIGNS AT DOORS



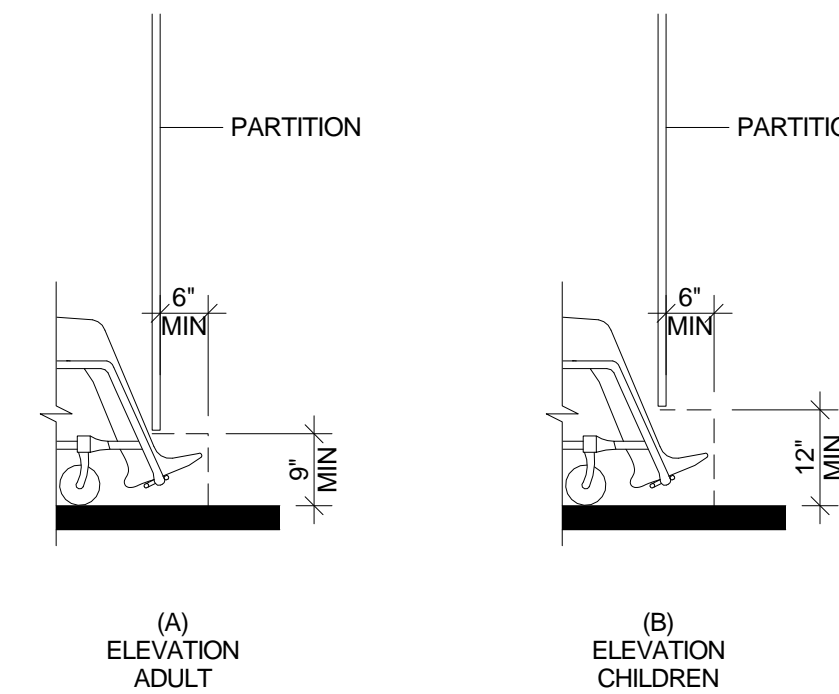
DISPENSERS



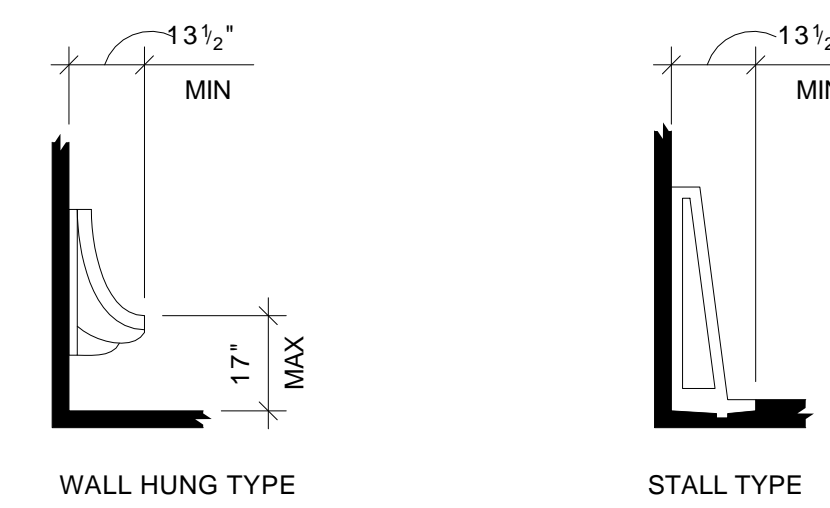
TOILET COMPARTMENTS DOORS



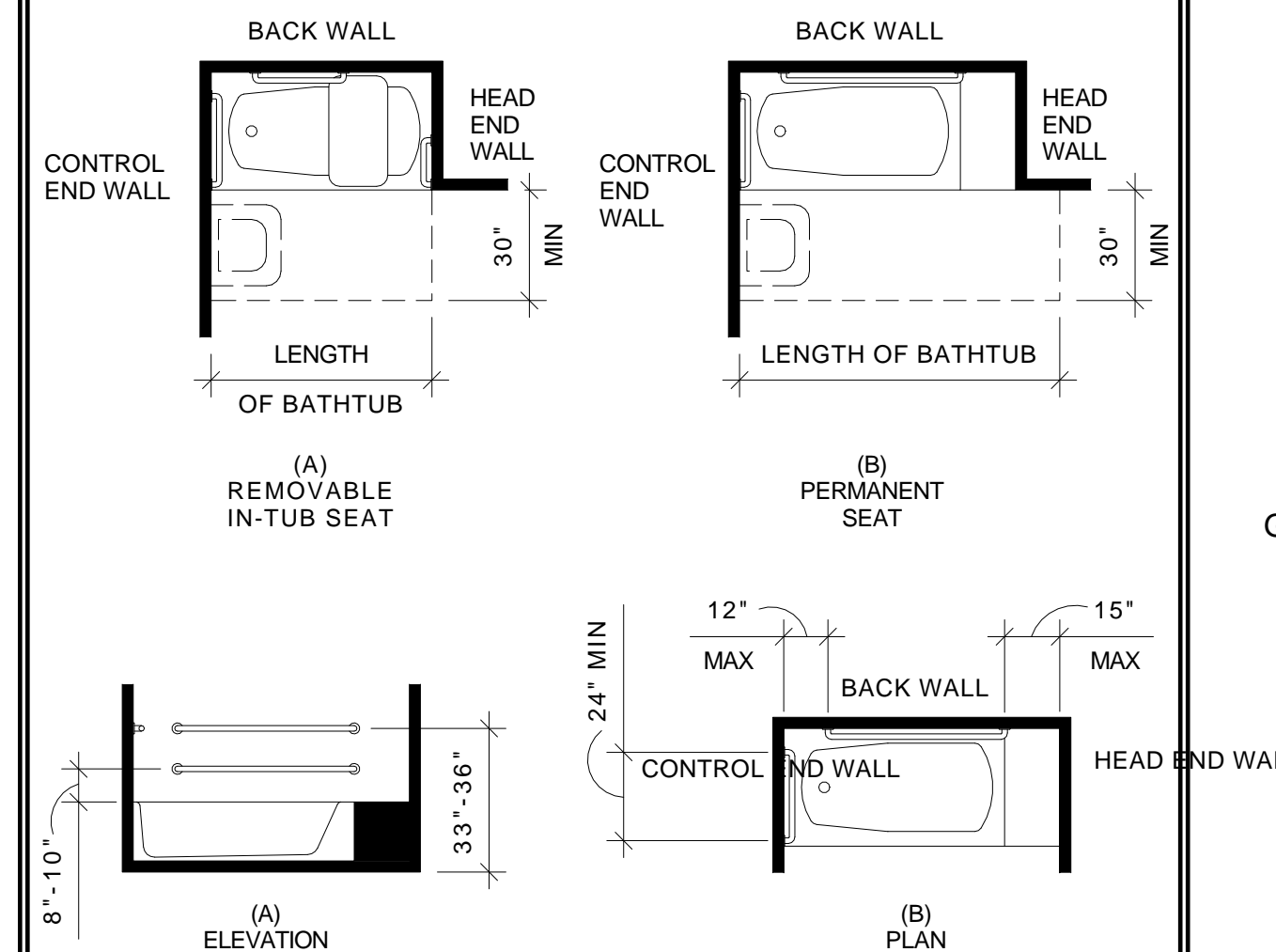
TOE CLEARANCE



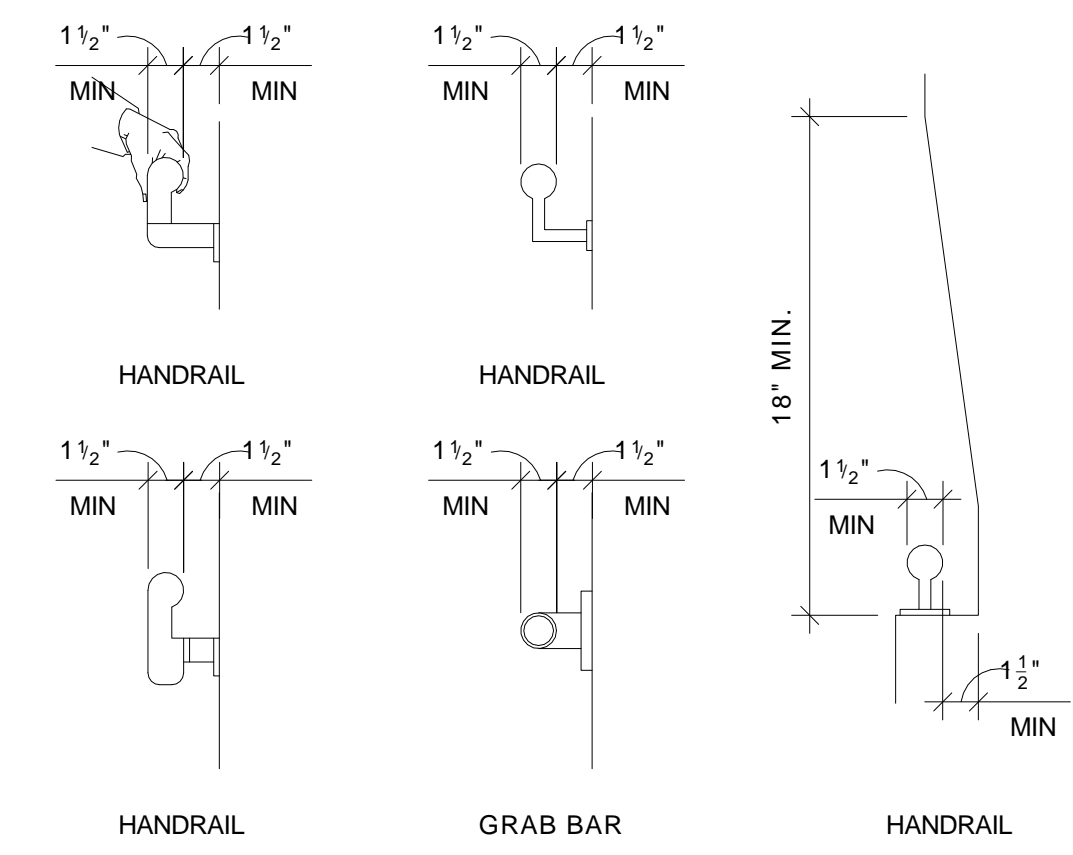
URINALS



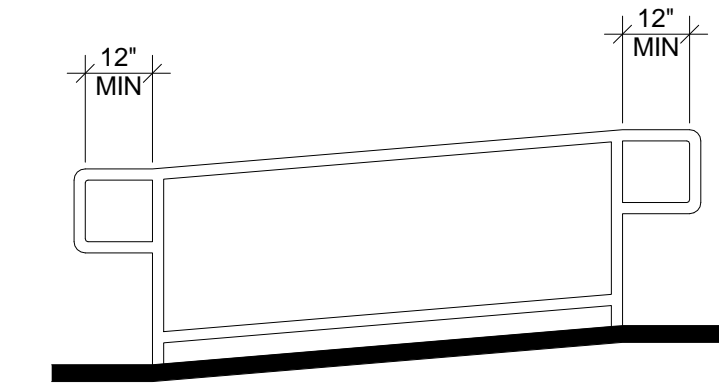
BATHTUBS



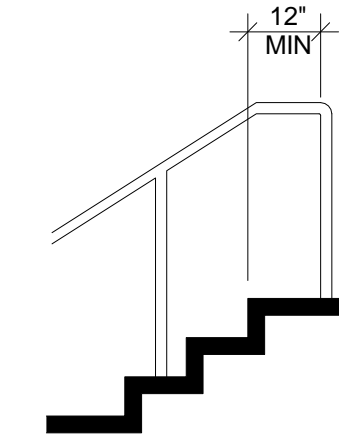
HANDRAIL CLEARANCE



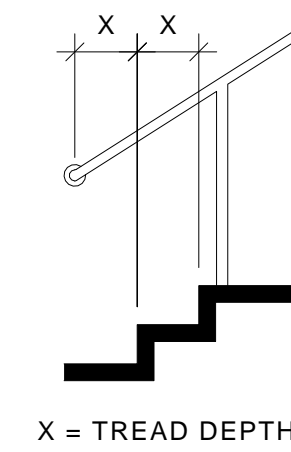
TOP AND BOTTOM EXTENSION AT RAMPS



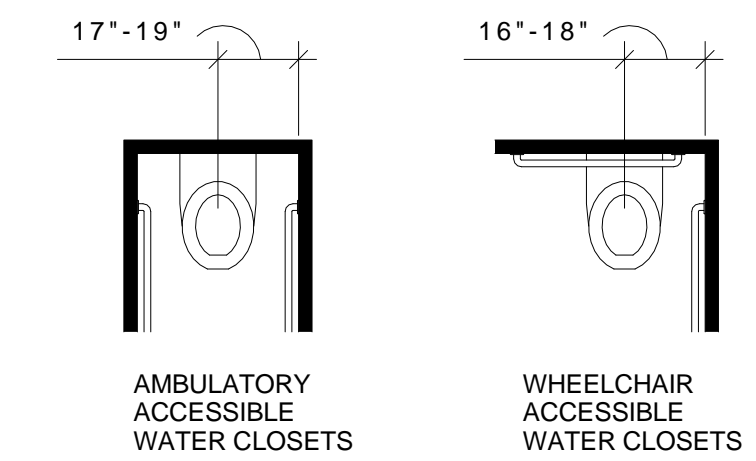
TOP EXTENSION AT STAIRS



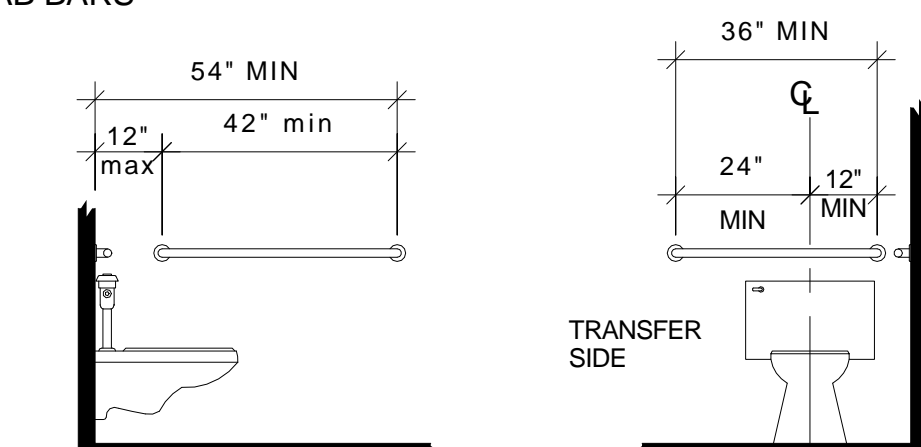
BOTTOM EXTENSION AT STAIRS



TOILET COMPARTMENTS



GRAB BARS

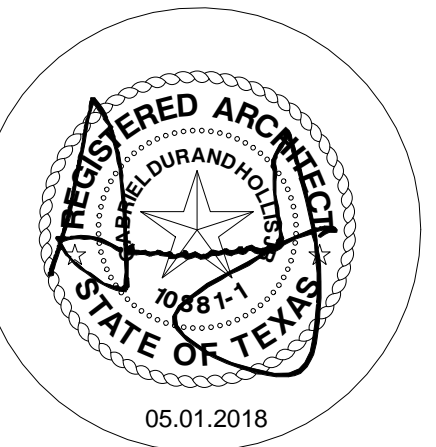


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PHONE: 210/308-0080 FAX: 210/697-3309 eMAIL: office@dhrarchitects.com

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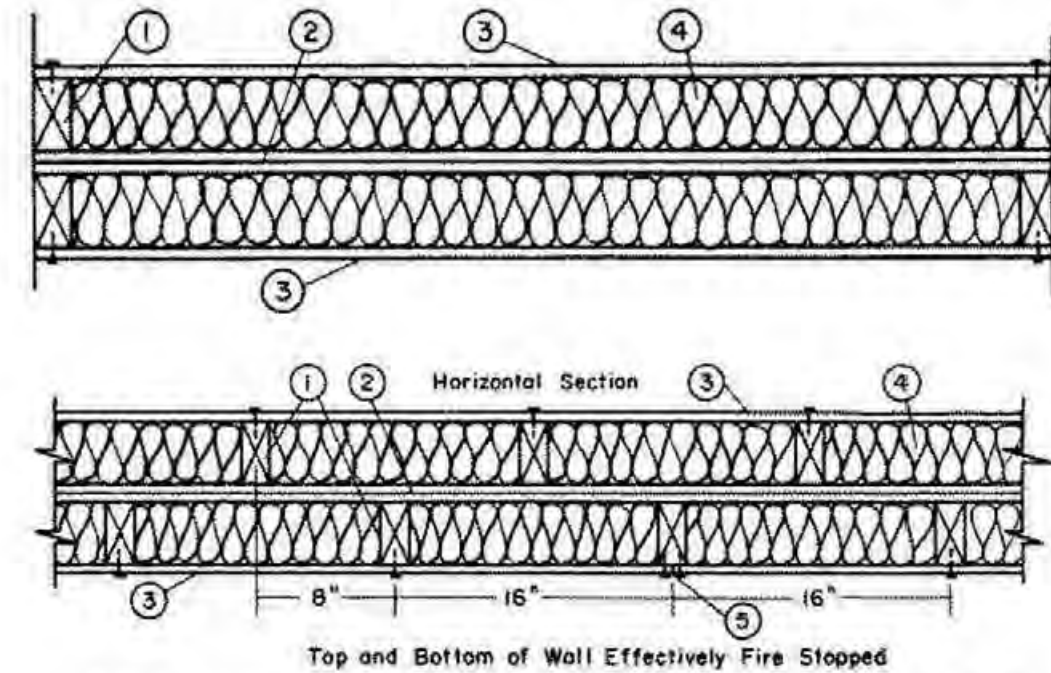
A001

Design No. U320

March 06, 2018

Nonbearing Wall Rating — 1-1/2 HR.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



1. Wood Studs and End Plates — Nominally 2 by 4 in., studs spaced 16 in. OC in each row with studs in opposite rows staggered 8 in. OC. Effectively fire stopped at top and bottom of wall.

2. Gypsum Sheathing — Regular 1/2 in. thick, two layers, 4 ft wide, one layer attached vertically to interior of each stud row with 1-1/2 in. long barbed 4d cement coated box nails spaced vertically 12 in. OC. Vertical joints in adjacent layers staggered 24 in.

3. Gypsum Board* — 1/2 in. thick, 4 ft wide. Gypsum board nailed vertically to studs with 1-1/2 in. long annular ring 4d cement coated nails spaced vertically 7 in. OC.

When Steel Framing Members* (Item 6-6C) are used, gypsum board attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

3A. Gypsum Board* — (As an alternate to Item 3) — 1/2 in. thick, 4 ft wide. Gypsum board attached vertically to studs with 1-5/8 in. long wallboard screws spaced vertically 7 in. OC.

When Steel Framing Members* (Item 6-6C) are used, gypsum board attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

NATIONAL GYPSUM CO — Type FSMR-C.

3B. Gypsum Board* — (As an alternate to Item 3, 3A) — 5/8 in. thick, 4 ft wide. Gypsum board attached vertically to studs with 1-3/4 in. long wallboard screws spaced vertically 7 in. OC.

When Steel Framing Members* (Item 6-6C) are used, gypsum board attached to furring channels with 1 in. long Type S bugle-head steel screws spaced 12 in. OC.

NATIONAL GYPSUM CO — Type FSMR-C.

4. Batts and Blankets* — 3 in. thick glass fiber or mineral wool batts, supplied in 15-in. widths installed to fill interior of stud cavities and friction held.

CERTAINTED CORP

JOHNS MANVILLE

KNAUF INSULATION LLC

OWENS CORNING

ROCKWOOL — Type AFB

5. Finishing System — Gypsum board joints covered with paper tape and joint compound. Nailheads covered with joint compound. As an alternate, non 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard with joints reinforced with paper tape.

6. Steel Framing Members* — (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:

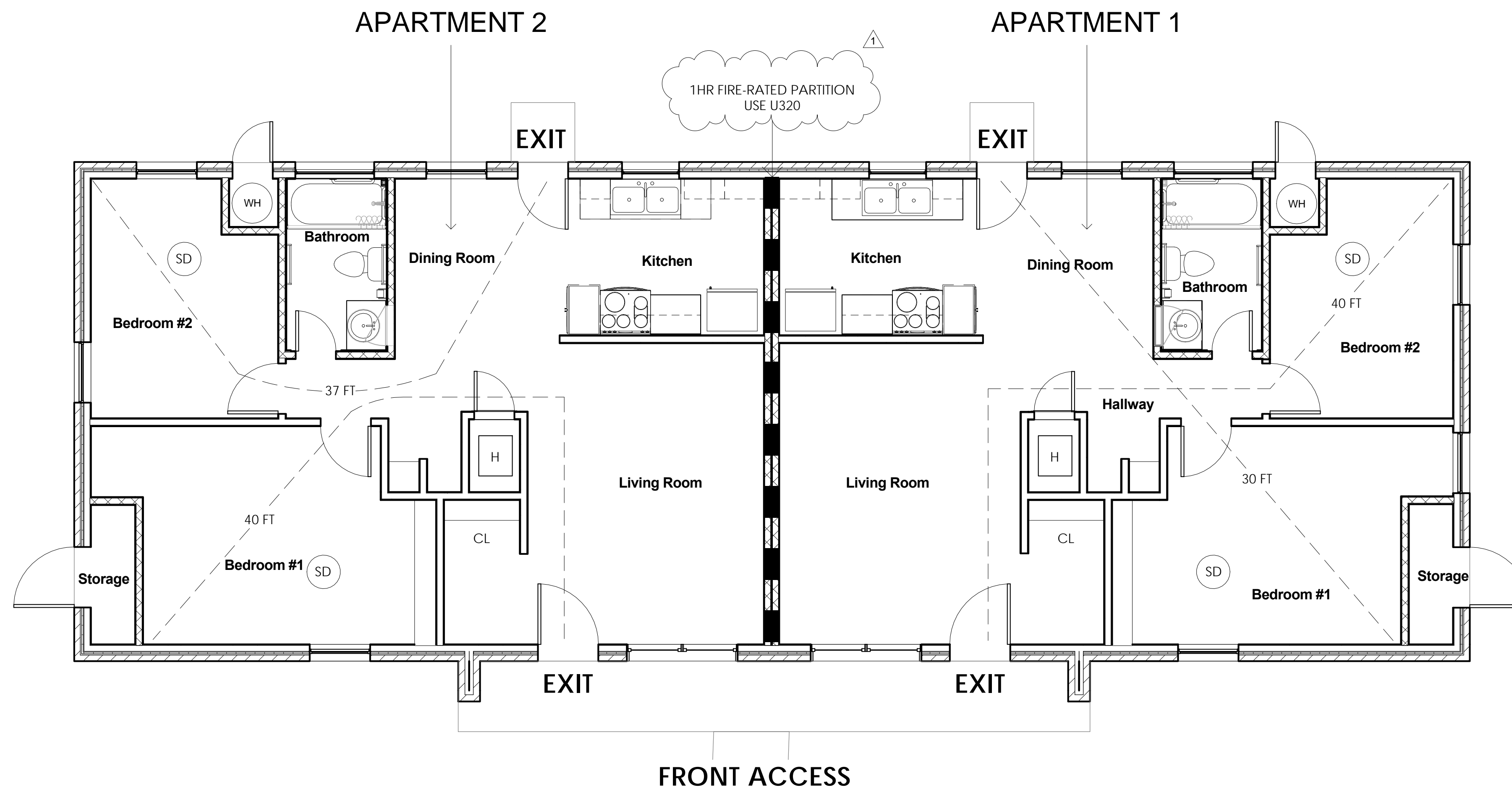
a. Furring Channels — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-lapping #8 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b. Steel Framing Members* — Used to attach furring channels (Item a) to studs (Item 1). Clips spaced 48 in. OC, and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels.

6A. Steel Framing Members* — (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:

a. Furring Channels — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-lapping #8 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 3.

b. Steel Framing Members* — Used to attach furring channels (Item a) to studs. Clips spaced 48 in. OC. Genie clips secured to studs with No. 8 x 1-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips. PLITEQ INC — Type Genie Clip



1 Life Safety Plan
1/4" = 1'-0"



CODE NOTES

THE RESTORATION SCOPE OF WORK DOES NOT CHANGE BUILDING OCCUPANCY TYPE.

OCCUPANCY: RESIDENTIAL
OCCUPANCY LOAD:
- RESIDENTIAL: 200 SF PER OCCUPANT
- 1750/200= 9 OCCUPANTS
BUILDING AREA: 1,750 SF
NUMBER OF UNITS: 2
NUMBER OF EXITS: 2 PER UNIT
EXIT REQUIREMENTS: 32IN WIDE & 72IN TALL

FIRE PROTECTION
SMOKE DETECTORS: 1 PER BEDROOM
GAS DETECTORS:

IECC 2015 - ENERGY CODE FOR RESIDENTIAL
FRAMED WALLS
ROOF
SLAB
GLAZING

FIRE SAFETY LEGEND

	FIRE EXTINGUISHER CABINET
	ROUTE TO NEAREST EXIT
	SMOKE DETECTOR

Total tenant square footage:

APT 1	
Living Room	230
Living Room Closet	27
Dining Room	66
Kitchen	79
Bedroom 1	157
Bedroom 2	102
Bath Room	42
Storage	15
Heater Closet	9
Water heater Closet	5.7
Total	732.7
APT 2	
Living Room	230
Living Room Closet	27
Dining Room	66
Kitchen	79
Bedroom 1	157
Bedroom 2	102
Bath Room	42
Storage	15
Heater Closet	9
Water heater Closet	5.7
Total	732.7

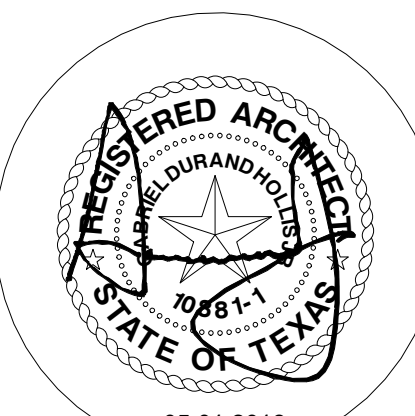


DURAND-HOLLIS RUPE ARCHITECTS, INC.
14603 HUEBNER RD.
BUILDING 18
SAN ANTONIO, TEXAS 78230
PHONE: 210/308-0080
FAX: 210/697-3309
eMAIL: office@dhrarchitects.com

REVISED ISSUE DATES

NO	ISSUE	DATE
1	Revision 1	10/10/17

An Apartment Restoration
TL SHALEY APARTMENTS
4827 PETTUS, SAN ANTONIO, TX 78228



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LIFE SAFETY PLAN

PROJECT NO.: 17-019
ISSUE DATE: 05/01/2018
DRAWN BY: AVF
REVIEWED BY: JEC
PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
TEXAS LICENSE NO. 10881

SHEET NO.:

A002

GENERAL NOTES

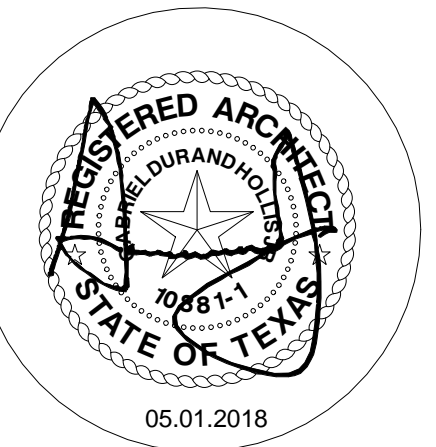
Legal Description: 8CB 11440, BLK F, Lot 64
 830 Rita Ave
 San Antonio, Texas, 78228
 Zoning RM-4
 San Antonio Housing Authority
 818 S. Flores Street
 San Antonio, Texas, 78204-1400



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

REVISED ISSUE DATES
 NO ISSUE DATE

An Apartment Restoration
TL SHALEY APARTMENTS
 4827 PETTUS, SAN ANTONIO, TX 78228



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SITE PLAT MAP

PROJECT NO.: 17-019
 ISSUE DATE: 05/01/2018
 DRAWN BY: AVF
 REVIEWED BY: JEC
 PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

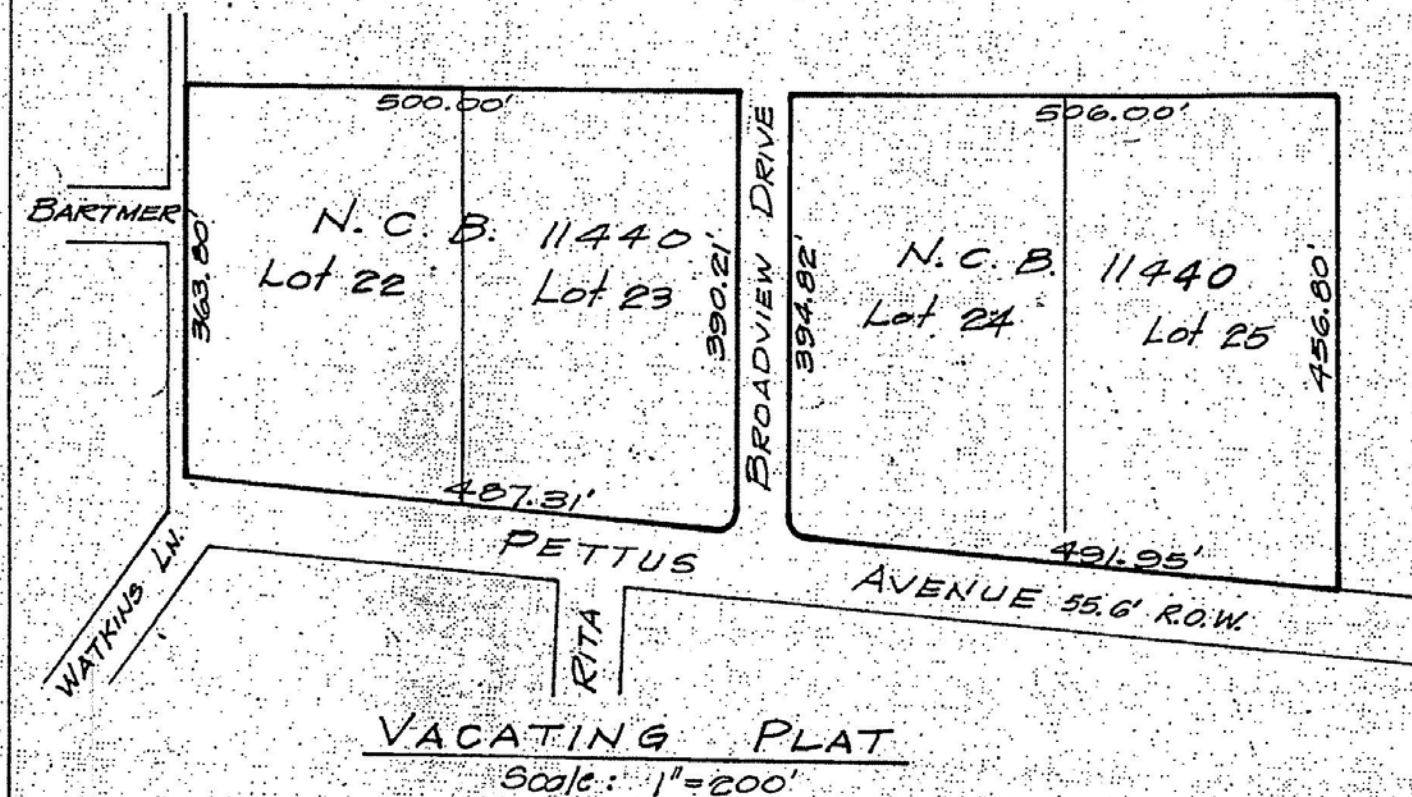
SHEET NO.:

A003

CURVE DATA				
No.	ANGLE	RADIUS	LENGTH	TANGENT
1	95°02'58"	15.00'	24.88'	10.38'
2	84°57'02"	15.00'	22.24'	13.73'
3	94°43'22"	6.00'	9.92'	6.52'
4	43°20'30"	5.00'	3.78'	1.99'
5	133°41'08"	50.00'	116.66'	116.90'
6	95°02'58"	11.00'	18.25'	12.01'
7	84°57'02"	6.00'	8.90'	5.43'
8	56°56'39"	5.00'	4.97'	2.71'
9	293°53'18"	50.00'	256.47'	
10	85°16'38"	6.00'	8.92'	5.52'
11	90°26'39"	30.37'	47.94'	30.61'
12	94°58'47"	15.00'	24.87'	16.37'
13	84°38'06"	15.00'	22.16'	13.66'

LEGEND:
 OVERHANG OH.
 ELECTRIC E.
 GAS G.
 TELEPHONE T.
 CABLE TELEVISION CT.

NOTE:
 NOTHING HIGHER THAN 42' TO BE ERECTED WITHIN THE 20' BUILDING SETBACK LINE ON THE EAST SIDE OF R.O.M. ON BROADVIEW.



STATE OF TEXAS
 COUNTY OF BEKAR
 I HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN THIS PLAT TO THE MATTERS OF STREETS, LOTS AND DRAINAGE LAYOUT AND TO THE BEST OF MY KNOWLEDGE THIS PLAT CONFORMS TO ALL REQUIREMENTS OF THE SUBDIVISION ORDINANCE, EXCEPT FOR THOSE VARIANCES GRANTED BY THE PLANNING COMMISSION OF THE CITY.

[Signature]
 REGISTERED PROFESSIONAL ENGINEER

SWORN TO AND SUBSCRIBED BEFORE ME THIS 26th DAY OF June A.D. 1980
[Signature]
 NOTARY PUBLIC
 BEKAR COUNTY, TEXAS

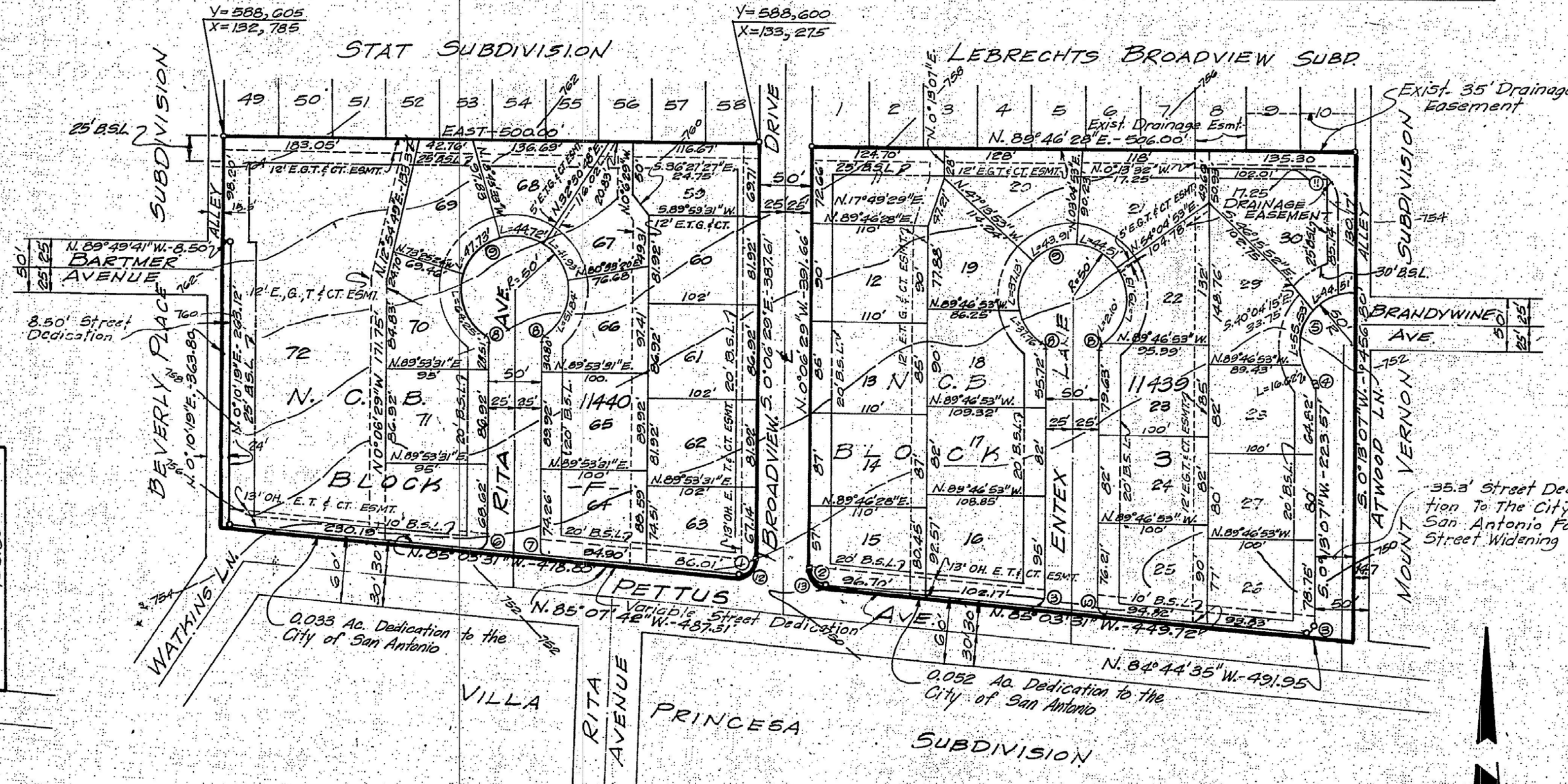
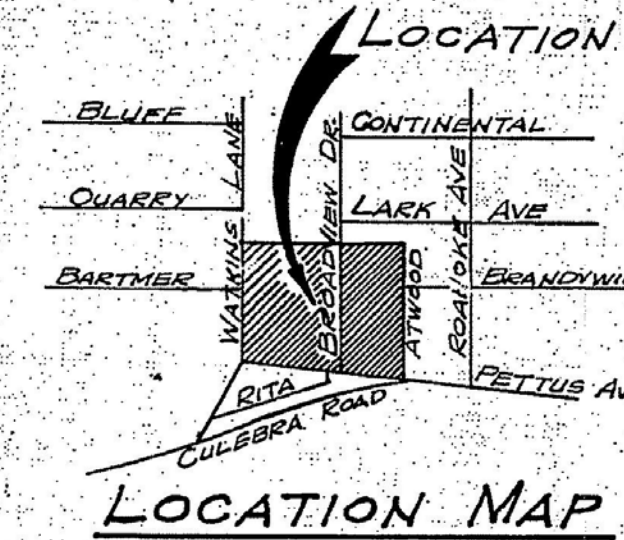
STATE OF TEXAS
 COUNTY OF BEKAR
 WILLIAM JACKSON THE OWNER OF THE LAND SHOWN ON THIS PLAT IN PERSON OR THROUGH A DULY AUTHORIZED AGENT DEDICATES TO THE USE OF THE PUBLIC FOREVER ALL STREETS, ALLEYS, PARKS, WATER COURSES, DRAINS, EASEMENTS AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

[Signature]
 OWNER

STATE OF TEXAS
 COUNTY OF BEKAR
 BEFORE ME, THE UNDERSIGNED AUTHORITY ON THIS DAY PERSONALLY APPEARED *[Signature]* KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.
 GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS 26th DAY OF June A.D. 1980
[Signature]
 NOTARY PUBLIC
 BEKAR COUNTY, TEXAS

The City of San Antonio as a part of its electric and gas system (City Public Service Board) is hereby dedicating the easements and rights-of-way for electric and gas distribution and service facilities in the areas designated on this plat as "Electric Easement", "Gas Easement", "Anchor Easement", "Service Easement", "Overhang Easement", "Utility Easement", and "Transformer Easement" for the purpose of installing, erecting poles, hanging or burying wires, cables, inspecting, patrolling, and maintaining, reconstructing, maintaining, removing, pipelines or lines and appurtenances thereto; together with the right of ingress within said easement and right-of-way areas, and the right to remove from said lands all trees or parts thereof, or other obstructions which endanger or may interfere with the efficiency of said lines or appurtenances thereto. It is agreed and understood that no buildings, concrete slabs, or walls will be placed within said easement areas.

Any CPS monetary loss resulting from modifications required of CPS equipment, located within said easement, due to gradechanges or ground elevation alterations shall be charged to the person or persons deemed responsible for said grade-changes or ground elevation alteration.



Correction Plat #
 OF
BROADVIEW PETTUS SUBDIVISION

BEING A VACATING PLAT OF LOTS 22 THROUGH 25, N.C.B. 11440 ESTABLISHING LOTS 59 THROUGH 72, BLOCK F N.C.B. 11440 & LOTS 11 THROUGH 30, BLOCK 3, N.C.B. 11439.
 * Correction: Removed wording "Recreation Area" from Lot 72 Block F, N.C.B. 11440, from plat recorded in Volume 9000, Page 44.

STATE OF TEXAS
 COUNTY OF BEKAR
 THE OWNER OF THE LAND SHOWN ON THIS PLAT AND WHOSE NAME IS SUBSCRIBED HERETO, HEREBY DECLARES LOTS 22 THRU 25, N.C.B. 11440 TO BE VACATED, AND ESTABLISHES THE AREA VACATED AS LOTS 59 THROUGH 72, BLOCK F, N.C.B. 11440 AND LOTS 11 THROUGH 30, N.C.B. 11439.

[Signature]
 OWNER

THIS PLAT OF BROADVIEW PETTUS SUBDIVISION HAS BEEN SUBMITTED TO AND CONSIDERED BY THE PLANNING COMMISSION OF THE CITY OF SAN ANTONIO, TEXAS AND IS HEREBY APPROVED BY SUCH COMMISSION DATED THIS 15th DAY OF APRIL A.D. 1981
 BY *[Signature]* CHAIRMAN
 BY *[Signature]* SECRETARY

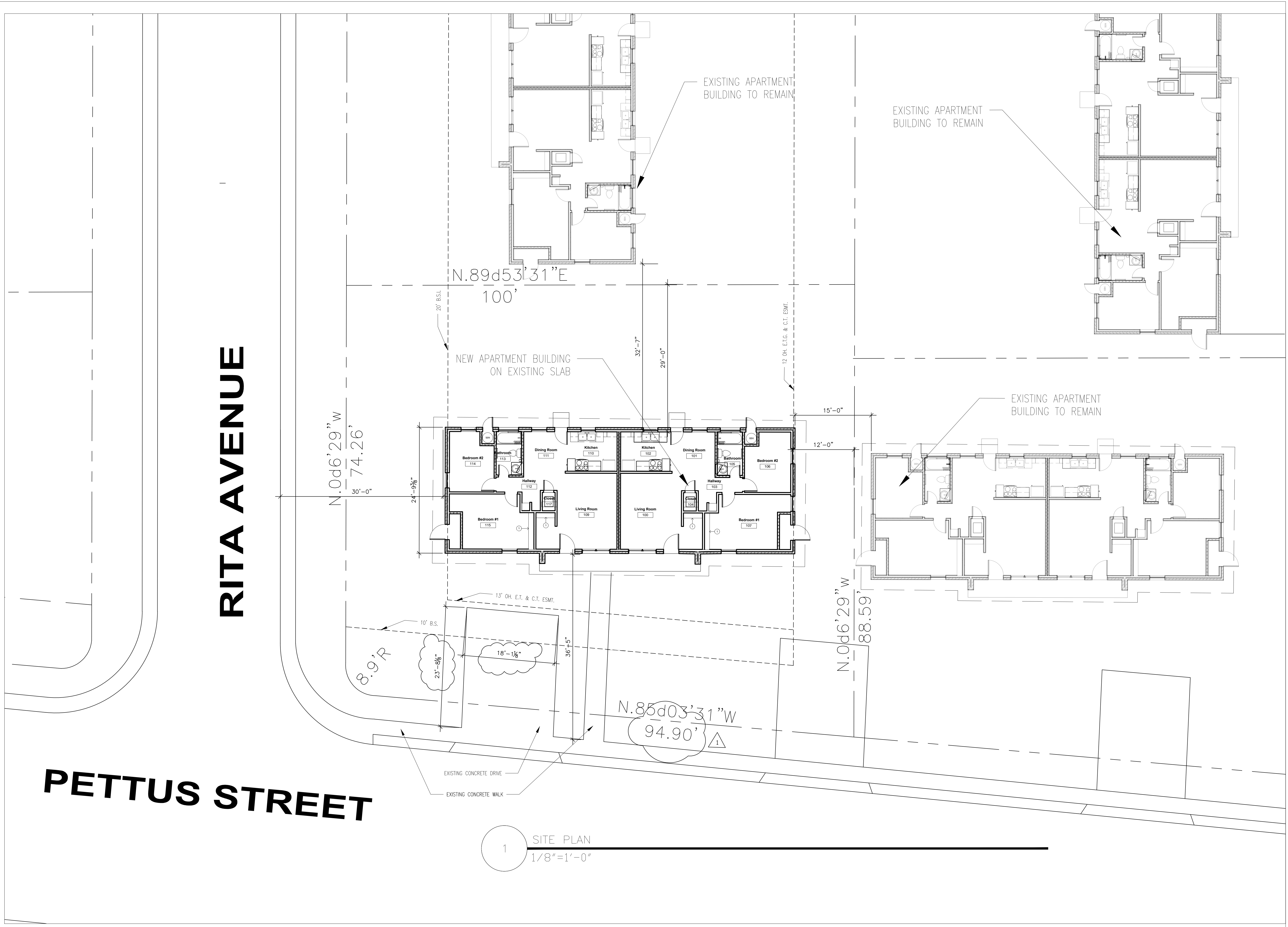
Filed for record 27 April A.D. 1981 at 8:53 o'clock A.M.
 Recorded & Indexed 14 May A.D. 1981 at 9:07 o'clock A.M.
 ROBERT D. GREEN
 County Clerk, Bexar County, Texas
 By *[Signature]* Deputy

STATE OF TEXAS
 COUNTY OF BEKAR
 I HEREBY CERTIFY THAT THIS PLAT IS TRUE AND CORRECT AND WAS PREPARED FROM AN ACTUAL SURVEY OF THE PROPERTY MADE UNDER MY SUPERVISION ON THE GROUND.
 SWORN TO AND SUBSCRIBED BEFORE ME THIS 26th DAY OF June A.D. 1980
[Signature]
 REGISTERED PROFESSIONAL ENGINEER
 OR
 REGISTERED PUBLIC SURVEYOR
 BEKAR COUNTY, TEXAS

STATE OF TEXAS
 COUNTY OF BEKAR
 I, COUNTY CLERK OF SAID COUNTY, DO HEREBY CERTIFY THAT THIS PLAT WAS FILED FOR RECORD IN MY OFFICE, ON THE DAY OF A.D. AT M AND DULY RECORDED THE DAY OF A.D. AT M IN THE RECORDS OF OF SAID COUNTY, IN BOOK VOLUME ON PAGE OF SAID COUNTY, IN MY HAND AND OFFICIAL SEAL OF OFFICE, THIS DAY OF A.D.

PREPARED BY:
MAVERICK ENGINEERING COMPANY
 SAN ANTONIO, TEXAS
 Job # 1514578
 APR 27 1981
VOL 9100 161

REVISED ISSUE DATES		
NO	ISSUE	DATE
1		10/10/2017



PETTUS STREET

RITA AVENUE

1 SITE PLAN
 1/8" = 1'-0"

An Apartment Restoration
TL SHALEY APARTMENTS
 4827 PETTUS, SAN ANTONIO, TX 78228

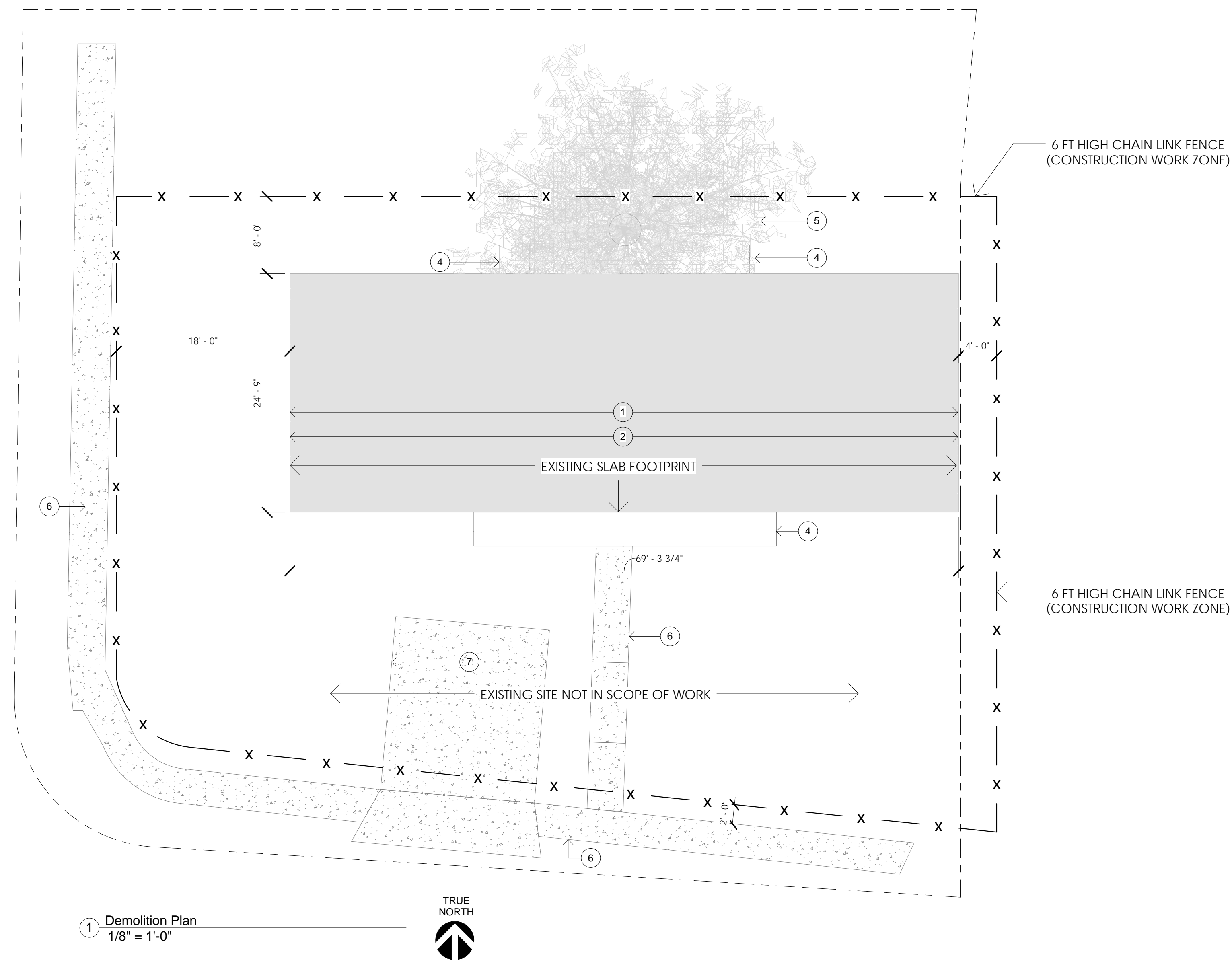


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PLAN DETAILS

PROJECT NO.: 17-019
 ISSUE DATE: 08/01/2017
 DRAWN BY: JEC
 REVIEWED BY: DHR
 PROJECT ARCHITECT: DHR
 GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

SHEET NO.:
A003A



GENERAL NOTES

GENERAL CONTRACTOR IS TO PROTECT ALL EXISTING WALKS, DRIVES AND PORCHES.

REFERENCE TREE PRESERVATION PLAN L-101.

SITE KEYED NOTES

1. REMOVE ALL EXISTING BUILDING COMPONENTS ABOVE EXISTING SLAB. CAP ALL EXISTING EXPOSED PIPING
2. EXISTING SLAB TO REMAIN: PREPARE CONCRETE SURFACE FOR NEW CONSTRUCTION
3. BRICK LUG ON THE SLAB PERIMETER TO REMAIN
4. EXISTING CONCRETE PORCHES TO REMAIN
5. EXISTING TREE TO REMAIN
6. EXISTING SIDEWALK TO REMAIN
7. EXISTING DRIVEWAY TO REMAIN



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

REVISED ISSUE DATES

NO	ISSUE	DATE
----	-------	------

An Apartment Restoration
TL SHALEY APARTMENTS
 4827 PETTUS, SAN ANTONIO, TX 78228



PHOTO I - EXISTING BUILDING FRONT VIEW - N.T.S.



PHOTO II - EXISTING BUILDING REAR VIEW - N.T.S.



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DEMO PLAN

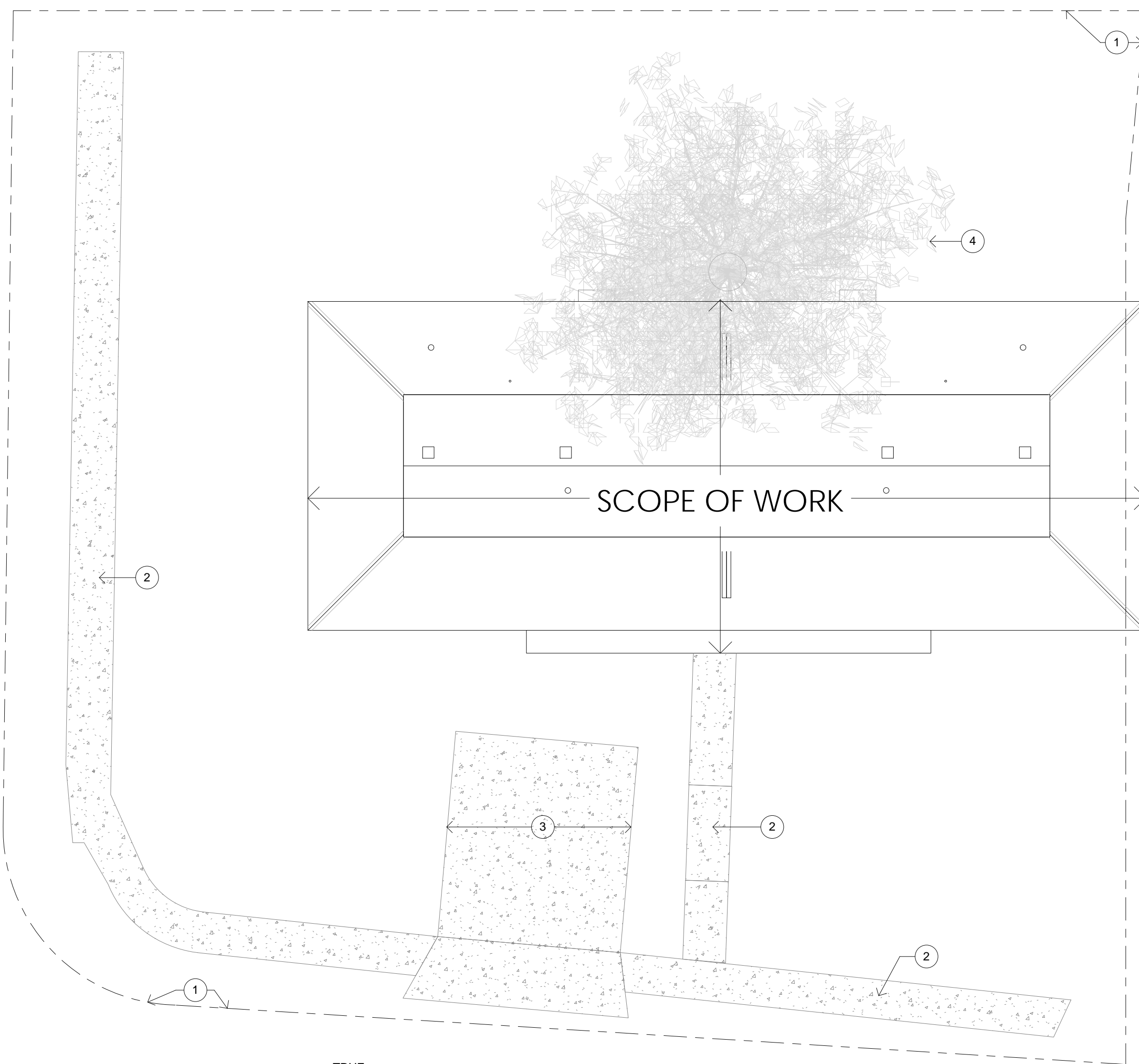
PROJECT NO.: 17-019
 ISSUE DATE: 05/01/2018
 DRAWN BY: AVF
 REVIEWED BY: JEC
 PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

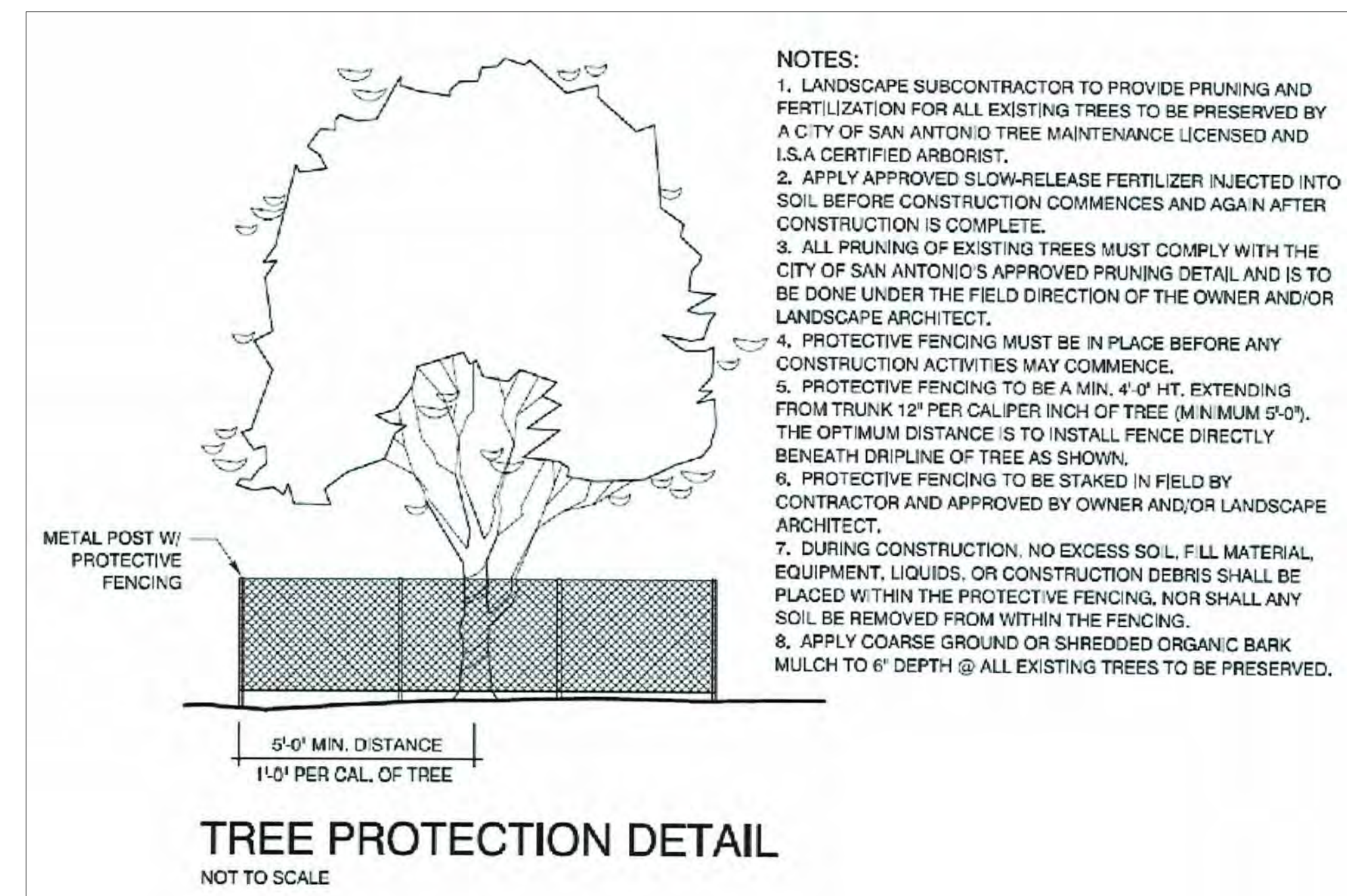
SHEET NO.:

A010

C:\Users\jrusseke\Documents\TL Shaley Apartments\Current\TL Shaley Restoration - 100% PERMIT SET
 FINAL_LATEST.dwg
 6/6/2018 11:35:20 AM



1 Site Plan
 1/8" = 1'-0"



2 Tree Protection Detail
 N.T.S.

GENERAL NOTES

1. GENERAL CONTRACTOR TO PROVIDE TREE PROTECTION DURING CONSTRUCTION. REFERENCE 2/A090

SITE KEYED NOTES

1. EXISTING PROPERTY LINE
2. EXISTING SIDEWALK
3. EXISTING DRIVEWAY
4. EXISTING TREE TO REMAIN

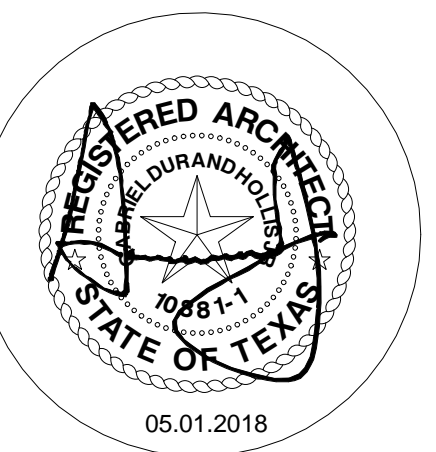


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 14603 HUEBNER RD.
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REVISED ISSUE DATES

NO	ISSUE	DATE

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 4827 PETTUS, SAN ANTONIO, TX 78228



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SITE PLAN

PROJECT NO.: 17-019
 ISSUE DATE: 05/01/2018
 DRAWN BY: AVF
 REVIEWED BY: JEC
 PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

SHEET NO.:

A090

GENERAL NOTES

ALL INTERIOR DIMENSIONS ARE TO STUD.
 GENERAL CONTRACTOR TO PROVIDE BLOCKING IN WALL WHERE NEEDED.
 REFERENCE SHEET A700 FOR PARTITION TYPES.

FLOOR PLAN KEYED NOTES

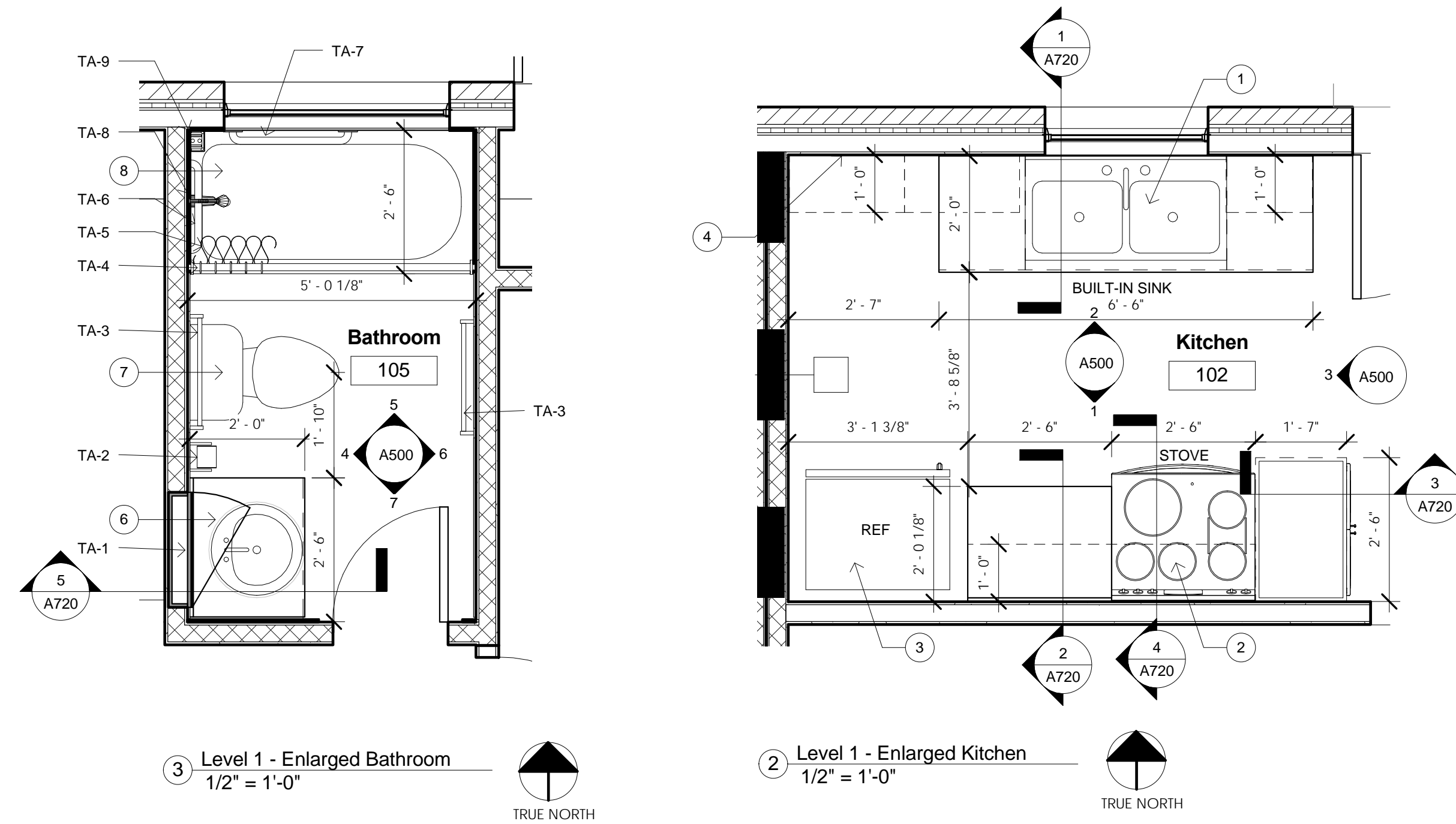
- KITCHEN SINK, REFERENCE MEP DRAWINGS
- KITCHEN STOVE WITH VENT HOOD ABOVE, REFERENCE MEP DRAWINGS
- KITCHEN REFRIGERATOR, REF MEP DRAWINGS
- WASHER AND DRYER CONNECTIONS
- LOCATION FOR ELECTRICAL PANELS, REFERENCE MEP DRAWINGS FOR DETAILS AND SPECS
- VANITY, REFERENCE MEP DRAWINGS
- WATER CLOSET, REFERENCE MEP DRAWINGS
- TUB, REFERENCE MEP DRAWINGS
- WATER HEATER, REFERENCE MEP DRAWINGS
- HOSE BIB, REFERENCE MEP DRAWINGS
- AHU (HEAT), REFERENCE MEP DRAWINGS
- DECORATIVE SECURITY GATES, REFERENCE DOOR SCHEDULE & DETAILS, A600

REVISED ISSUE DATES

NO	ISSUE	DATE
----	-------	------

TOILET ACCESSORY LEGEND

TA-1	RECESSED MEDICINE CABINET - BY BOBRICK	B-398
TA-2	SURFACE -MOUNTED ROLL TOILET PAPER DISPENSER	B-253
TA-3	SURFACE -MOUNTED TOWEL BAR - 24"	B-674
TA-4	SHOWER CURTAIN ROD - 1" STAINLESS STEEL - 60"	B-207
TA-5	SHOWER VINYL CURTAIN - 70"W X 72" H	B-204-3
TA-6	STAINLESS STEEL GRAB BAR 1-1/4" - 18"	B-5806 X 18
TA-7	STAINLESS STEEL GRAB BAR 1-1/4" - 24"	B-5806 X 24
TA-8	SHOWER TRIM KIT - BY AMERICAN STANDARD	T375.120
TA-9	SURFACE MOUNTED SOAP DISH	B-680

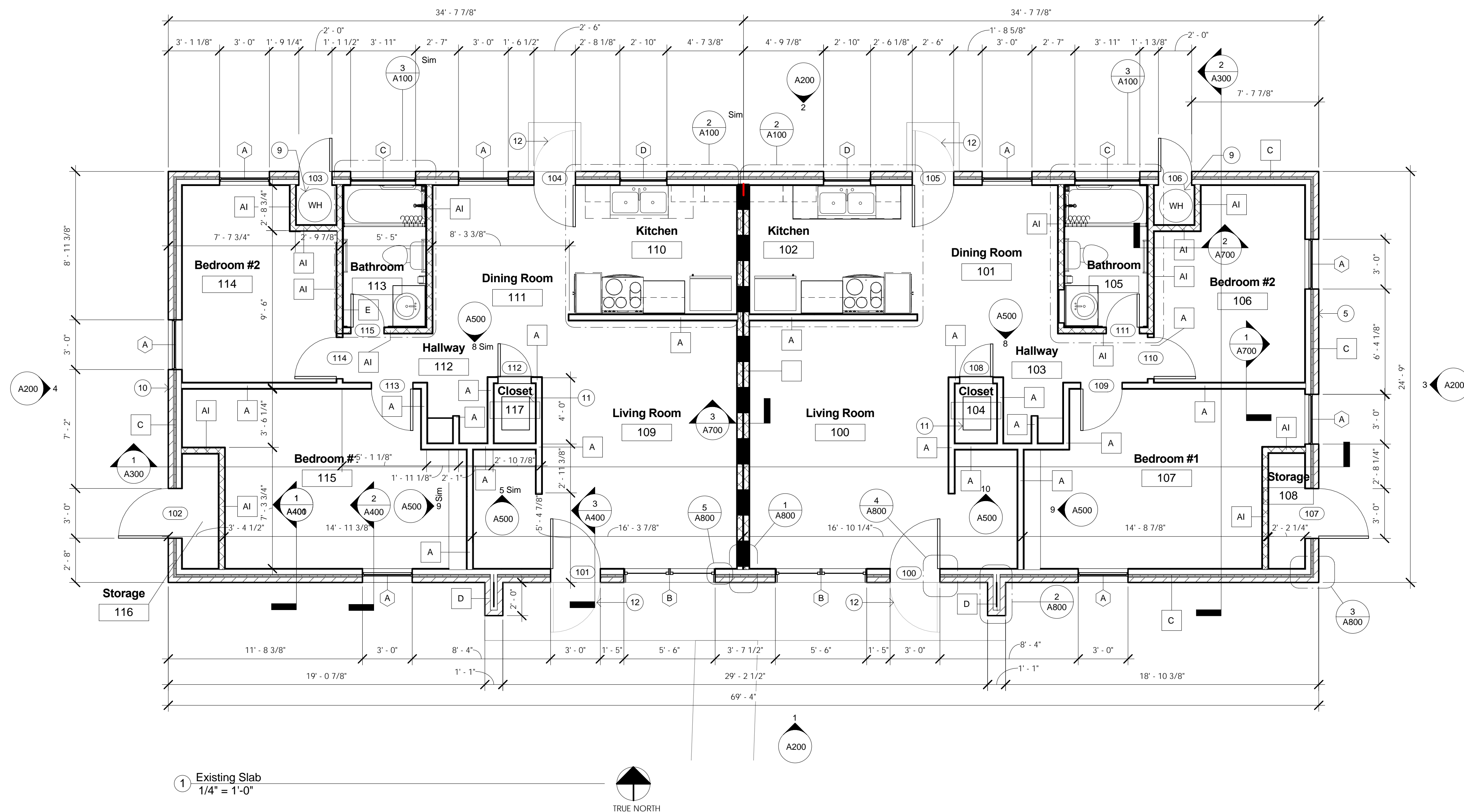


WALL LEGEND

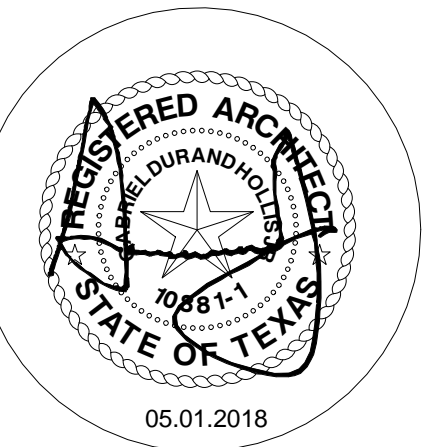
	WALL TILE
	INTERIOR WOOD STUD WALL
	INTERIOR WOOD STUD INSULATED
	DEMISING WALL
	EXTERIOR BRICK WALL ON WOOD STUD - INSULATED
	EXTERIOR BRICK WALL ON WOOD STUD

PARTITION TYPES

A	3 1/2" WOOD STUD @ 24" O.C.
A-I	3 1/2" WOOD STUD @ 24" O.C. WITH INSULATION
B	3 1/2" + 3 1/2" WOOD STUD @ 16" O.C. - 1HR FIRE RATED
C	9 1/8" BRICK WALL ON WOOD STUD WITH INSULATION
D	MASONRY VENEER ON WOOD STUD @ 24" O.C.



An Apartment Restoration
TL SHALEY APARTMENTS
 4827 PETTUS, SAN ANTONIO, TX 78228



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FLOOR PLAN

PROJECT NO.: 17-019
 ISSUE DATE: 05/01/2018
 DRAWN BY: AVF
 REVIEWED BY: JEC
 PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

SHEET NO.:

A100

GENERAL NOTES

REFERENCE MEP DRAWINGS FOR LIGHTING FIXTURE SELECTIONS AND SPECIFICATIONS.

RCP KEYED NOTES

1. ROOF OUTLINE ABOVE
2. PERFORATED METAL SOFFIT PANELS
3. DRYWALL CEILING, PAINTED
4. OPEN TO ABOVE

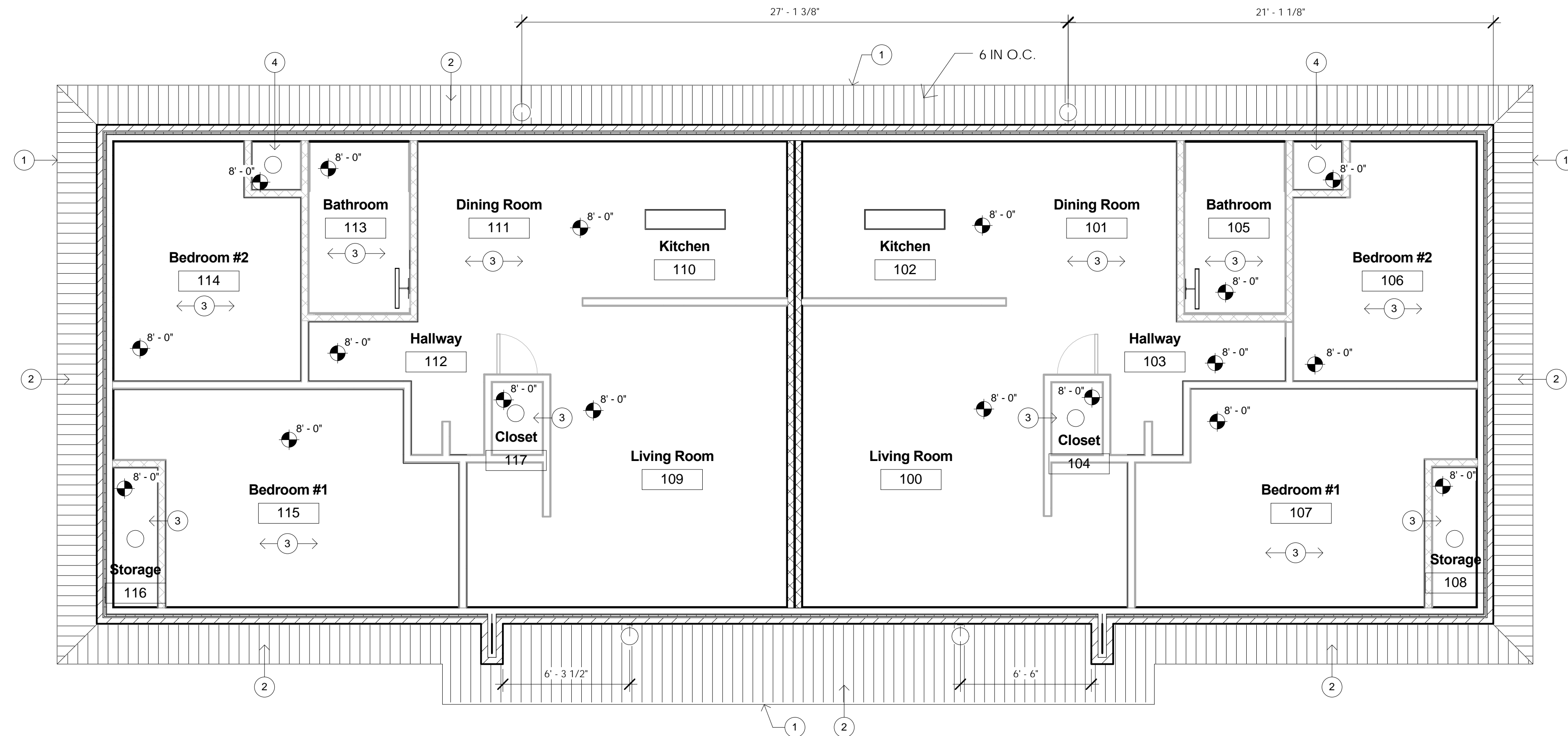
RCP LEGEND

	SURFACE MOUNTED LIGHT
	EXTERIOR WALL MOUNTED LIGHT
	VANITY, WALL MOUNTED LIGHT
	FLUORESCENT LIGHT, REF. MEP

REVISED ISSUE DATES

NO	ISSUE	DATE

An Apartment Restoration
TL SHALEY APARTMENTS
 4827 PETTUS, SAN ANTONIO, TX 78228



1 Reflected Ceiling Plan
 1/4" = 1'-0"



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REFLECTED CEILING PLAN

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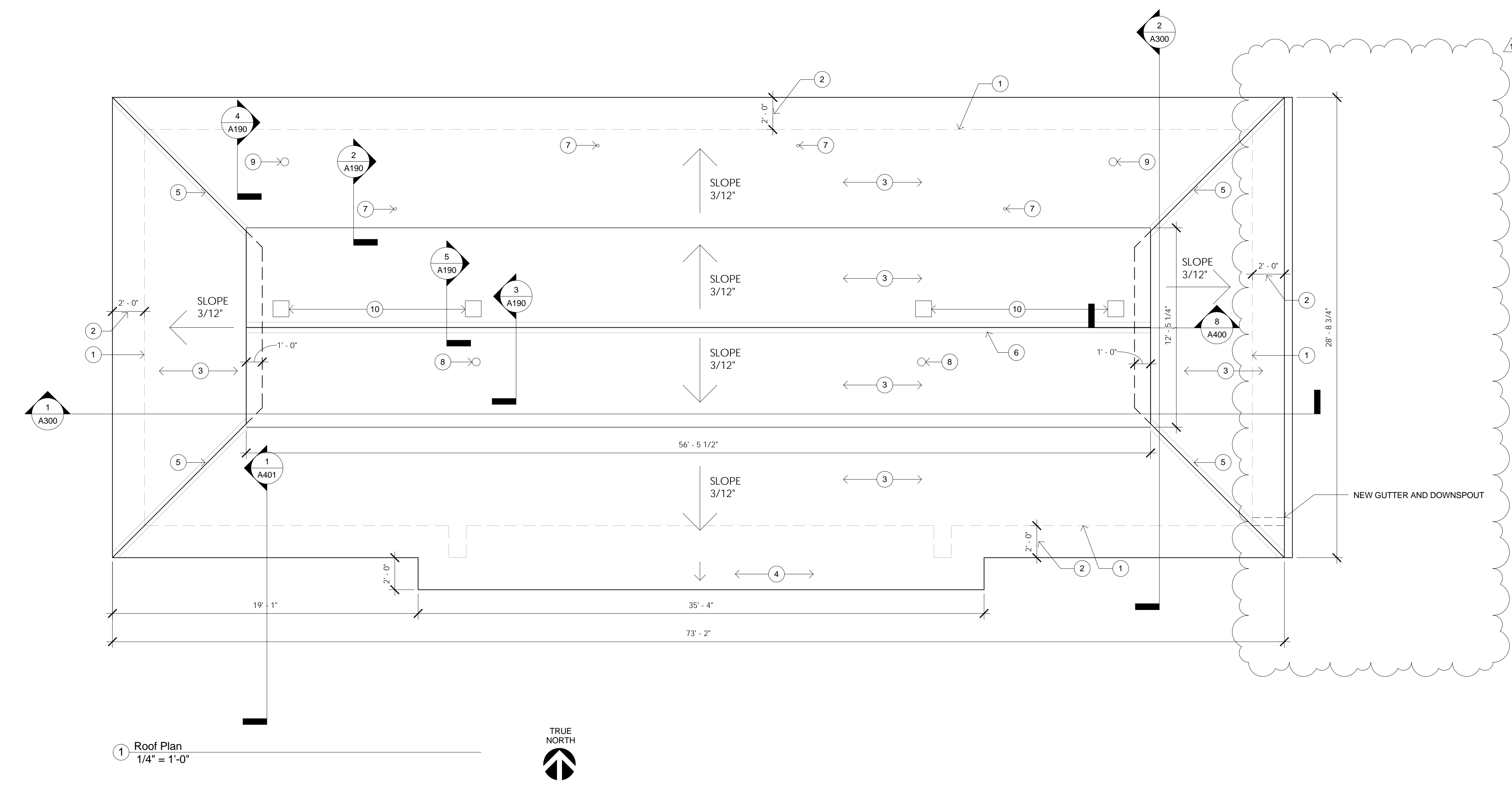
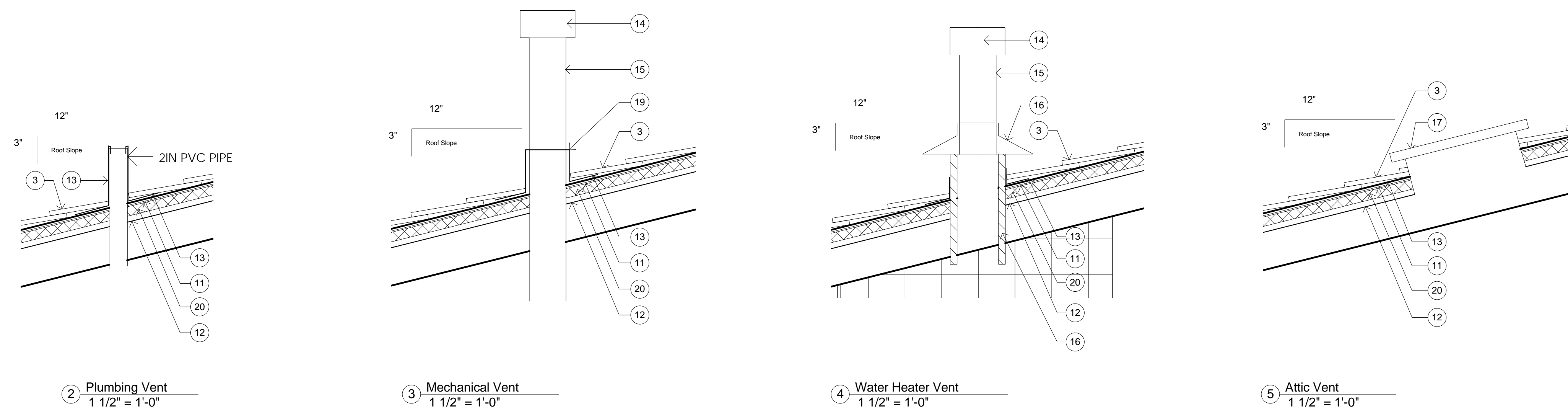
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ARCHITECTS, INC.
14603 HUEBNER RD.
BUILDING 18
SAN ANTONIO, TEXAS 78230
PHONE: 210/308-0080
FAX: 210/697-3309
eMAIL: office@dhrarchitects.com

ROOF NOTES

1. BUILDING OUTLINE BELOW
2. 2FT ROOF OVERHANG ON PERIMETER
3. 3 TAB ASPHALT ROOFING, REFERENCE SPECS
4. ROOF OVERHANG AT FRONT PORCH
5. SHINGLE COVERED HIP
6. SHINGLE COVERED RIDGE
7. PLUMBING VENT, REF 2/A190
8. MECHANICAL VENT, REF 3/A190
9. WATER HEATER VENT, REF 4/A190
10. ATTIC VENT, REF 5/A190
11. ROOF UNDERLAYMENT
12. 1/2" WOOD DECKING
13. LEAD FLASHING
14. FLUE CAP
15. 4" METAL VENT, REF MEP
16. STORM COLLAR
17. GALVANIZED METAL DOME
18. 4"x12" DOUBLE WALL SS. VENT PIPE
19. 4"x8" ROOF FLASHING
20. 1" POLY ISO INSULATION

REVISED ISSUE DATES

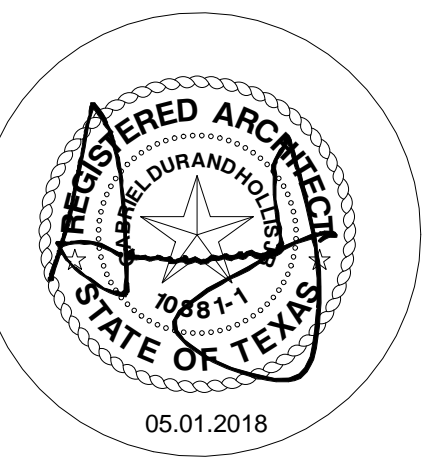
NO	ISSUE	DATE
1	Revision 1	10/10/17



1 Roof Plan
1/4" = 1'-0"



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ROOF PLAN

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A190

EXTERIOR ELEVATIONS NOTES

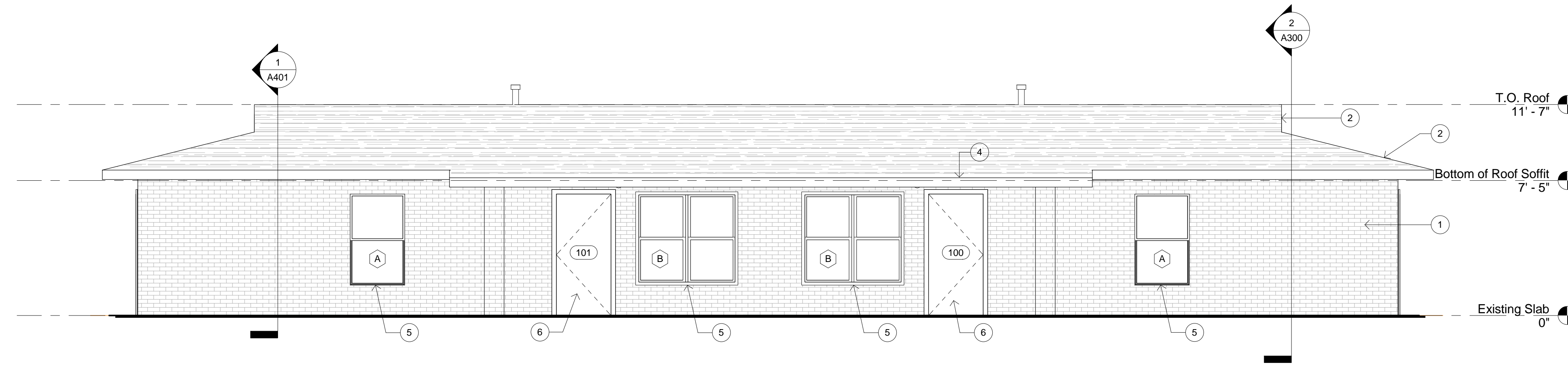
1. BRICK VENEER, REFERENCE SPECIFICATIONS
2. ASPHALT SHINGLES ROOF AS SCHEDULED
3. ELECTRICAL PANELS, REFERENCE MEP
4. ROOF OVERHANG AT FRONT PORCH
5. WINDOW AS SCHEDULED, REFERENCE A600
6. DOOR AS SCHEDULED, REFERENCE A600
7. HOSE BIB, REFERENCE MEP
8. LOUVER ATTIC VENT AS SCHEDULED



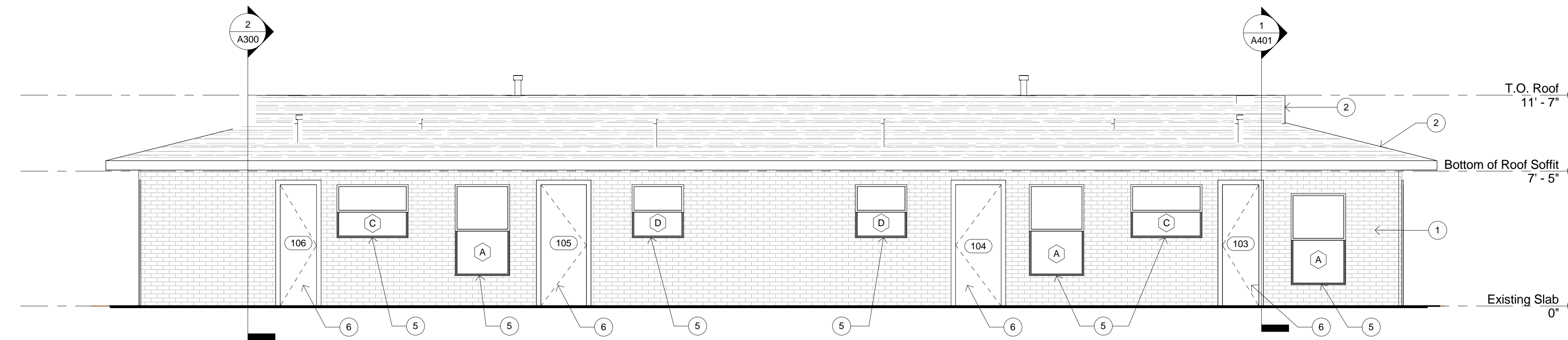
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 14603 HUEBNER RD.
 BUILDING 18
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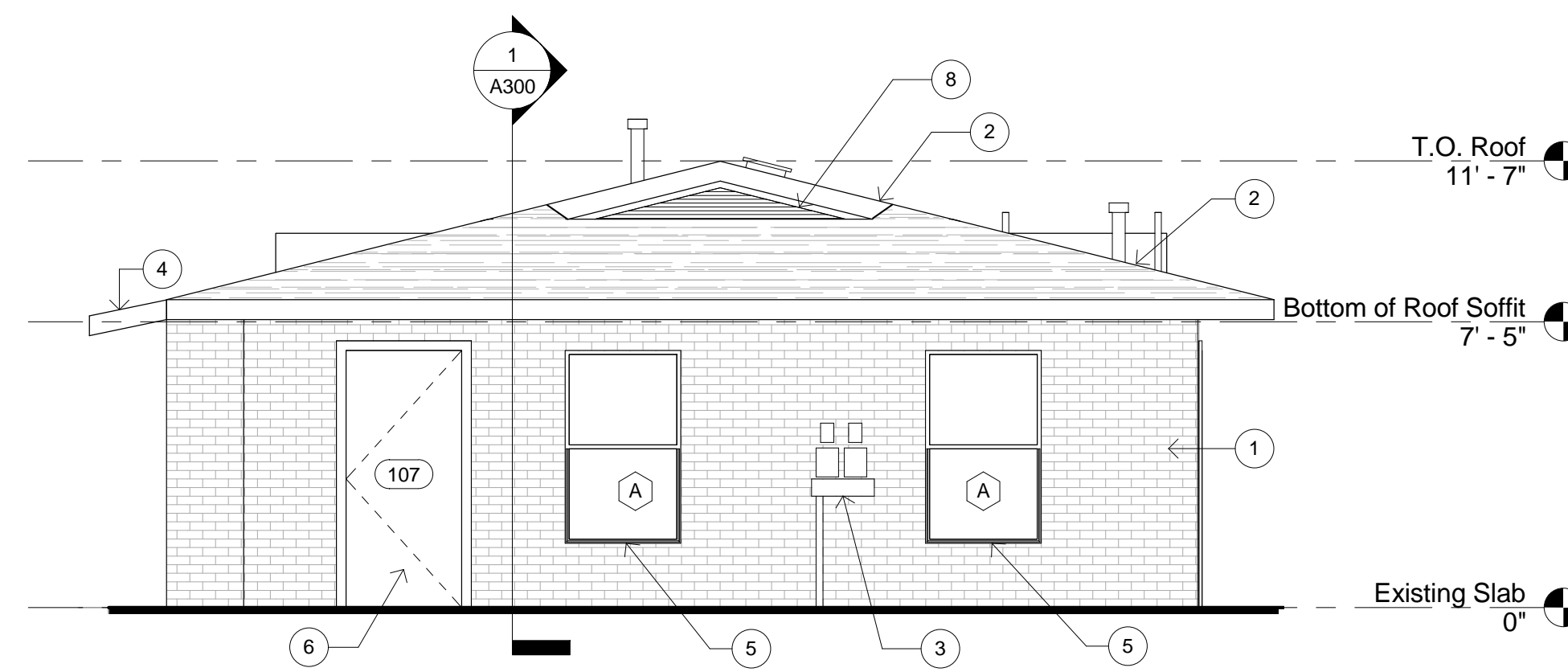
NO	ISSUE	DATE



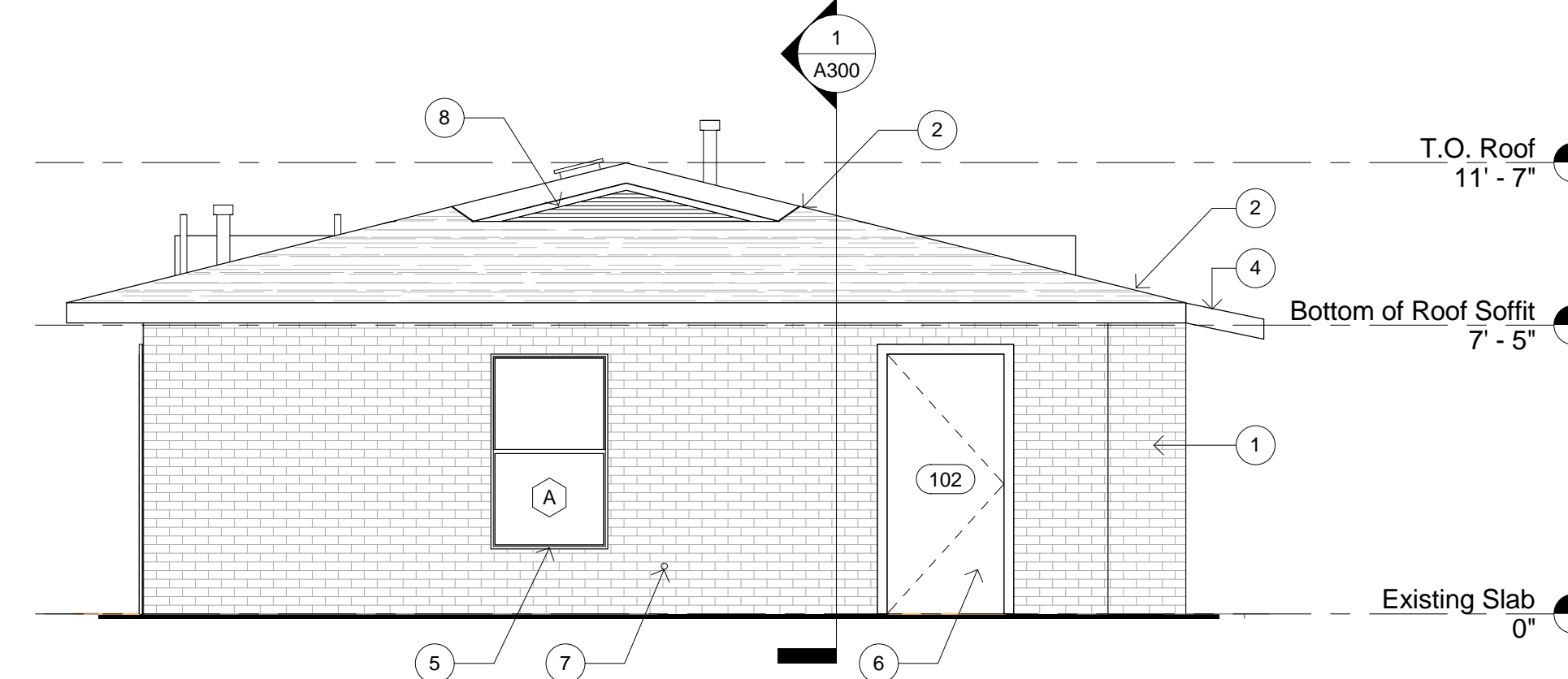
1 South Building Elevation
 1/4" = 1'-0"



2 North Building Elevation
 1/4" = 1'-0"



3 East Building Elevation
 1/4" = 1'-0"



4 West Building Elevation
 1/4" = 1'-0"

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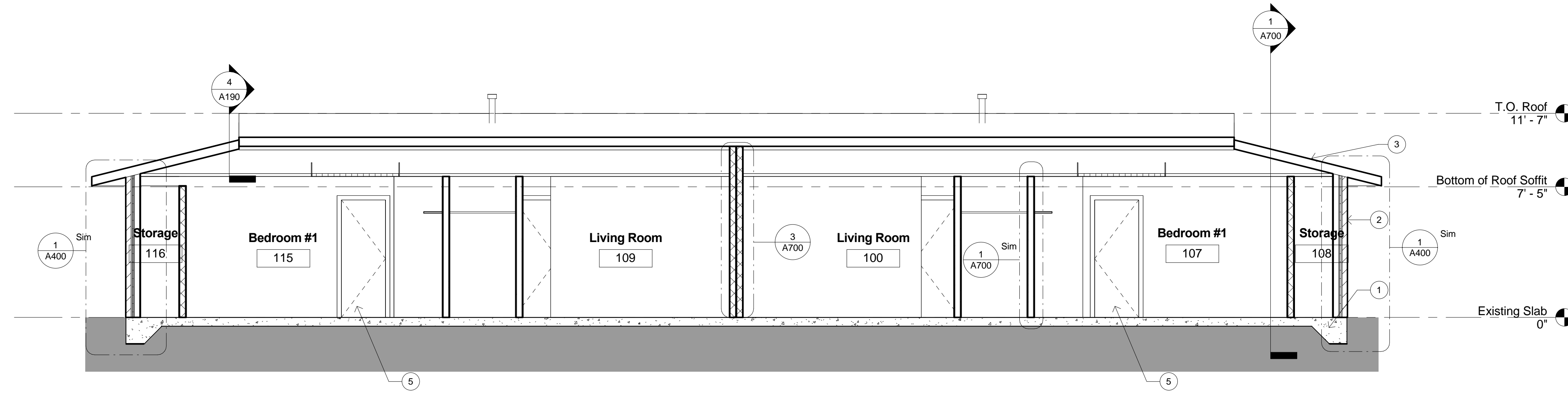


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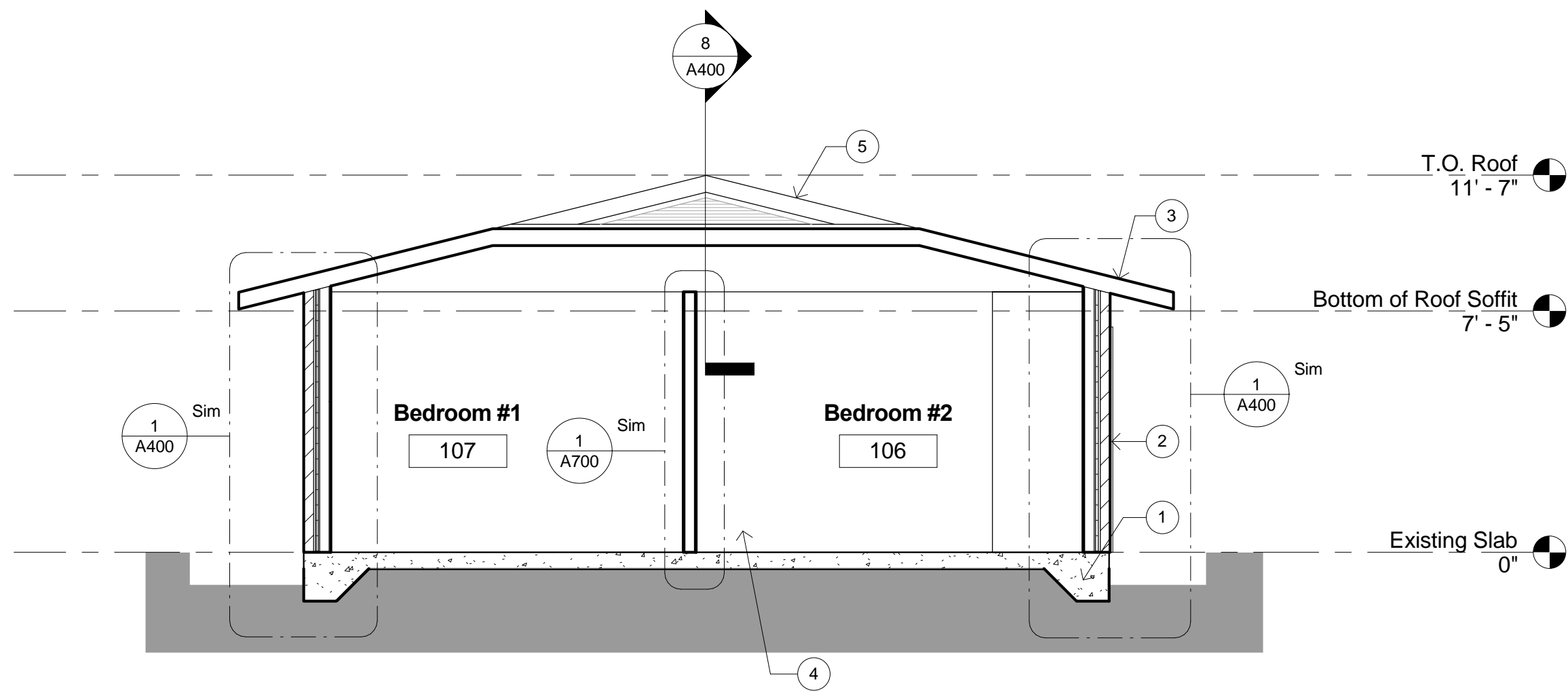
EXTERIOR ELEVATIONS

PROJECT NO.: 17-019
 ISSUE DATE: 05/01/2018
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SHEET NO.:
A200



1 Long Section
 1/4" = 1'-0"



2 Short Section
 1/4" = 1'-0"

BUILDING SECTION NOTES

1. EXISTING CONCRETE SLAB TO REMAIN
2. BRICK WALL AS SCHEDULED
3. SHINGLES ROOF AS SCHEDULED
4. DOOR AS SCHEDULED
5. LOUVER ATTIC VENT



DURAND-HOLLIS RUPE
 ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

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BUILDING SECTIONS

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SHEET NO.:

A300

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION OF SPECIAL CONDITION APPLICATIONS INDICATED IN TABLE 402.1.1 (SEE BELOW)

TABLE N1102.4.1.1 (402.4.1.1)
 AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffits shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door/jamb and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing; and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawl space walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the dry wall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

1. In addition, inspection of top seats shall be in accordance with the provisions of ICC 402.



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

REVISED ISSUE DATES		
NO	ISSUE	DATE
1	Revision 1	10/10/17

An Apartment Restoration
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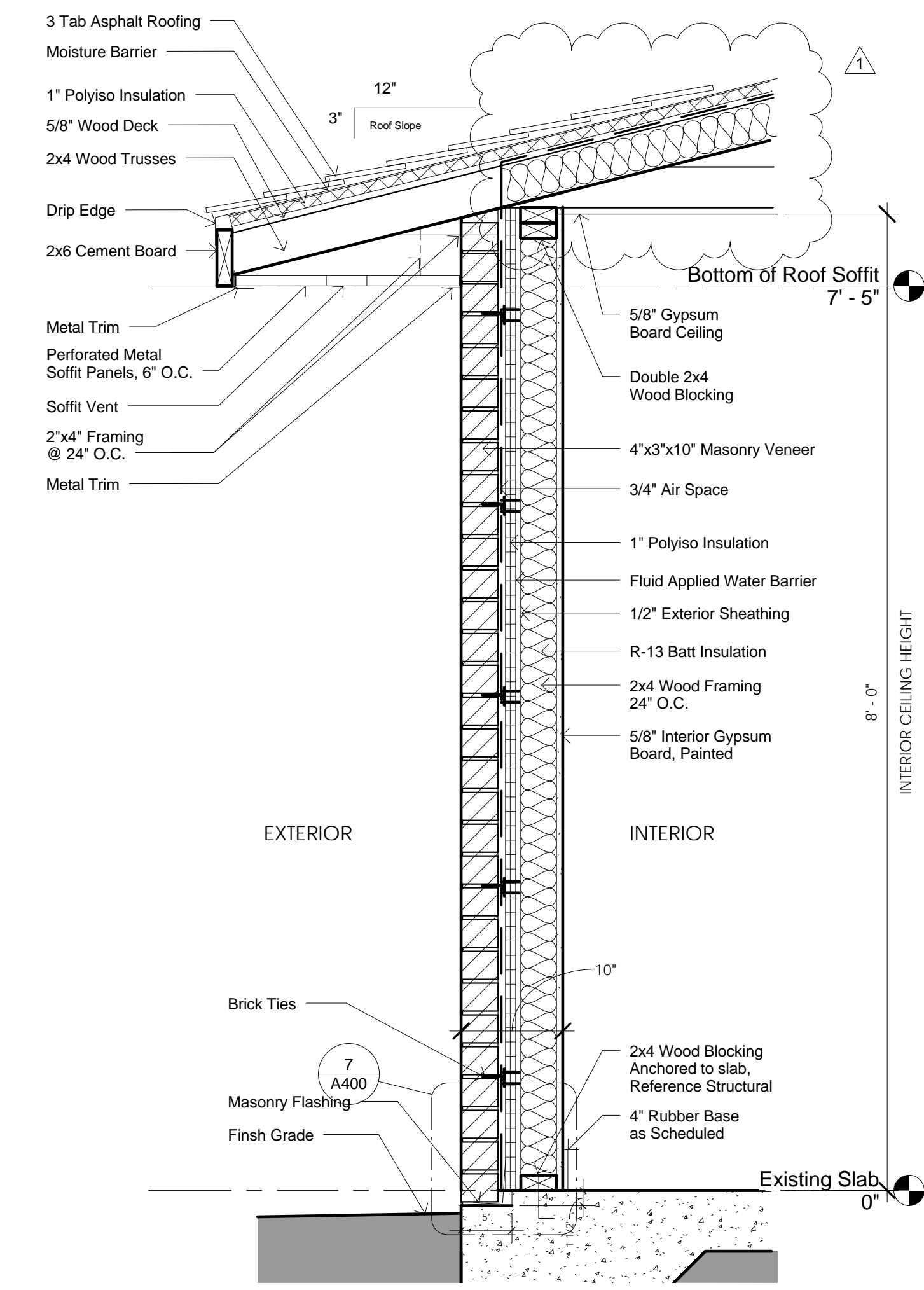
EXTERIOR WALL SECTIONS

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 REVIEWED BY: JEC
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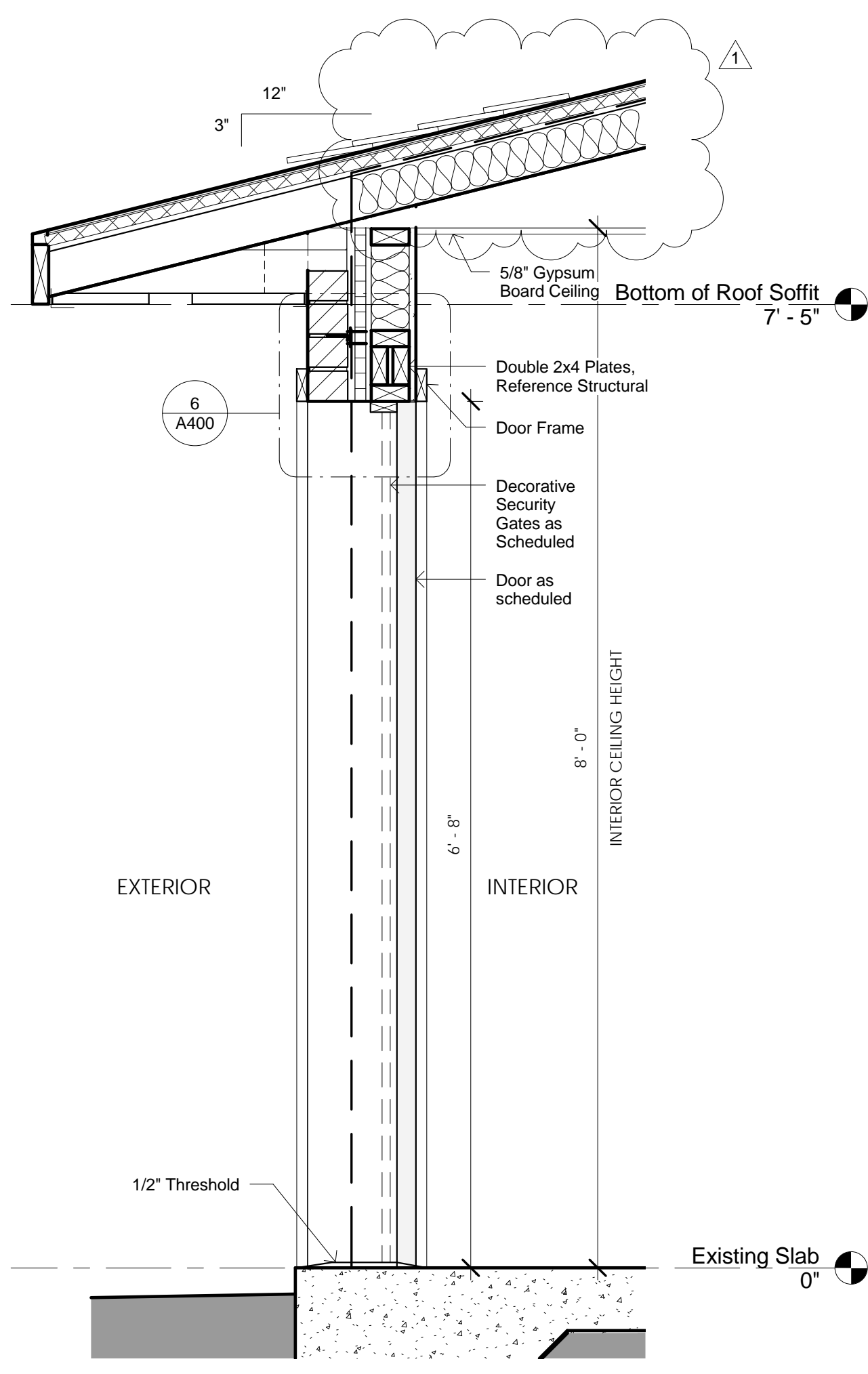
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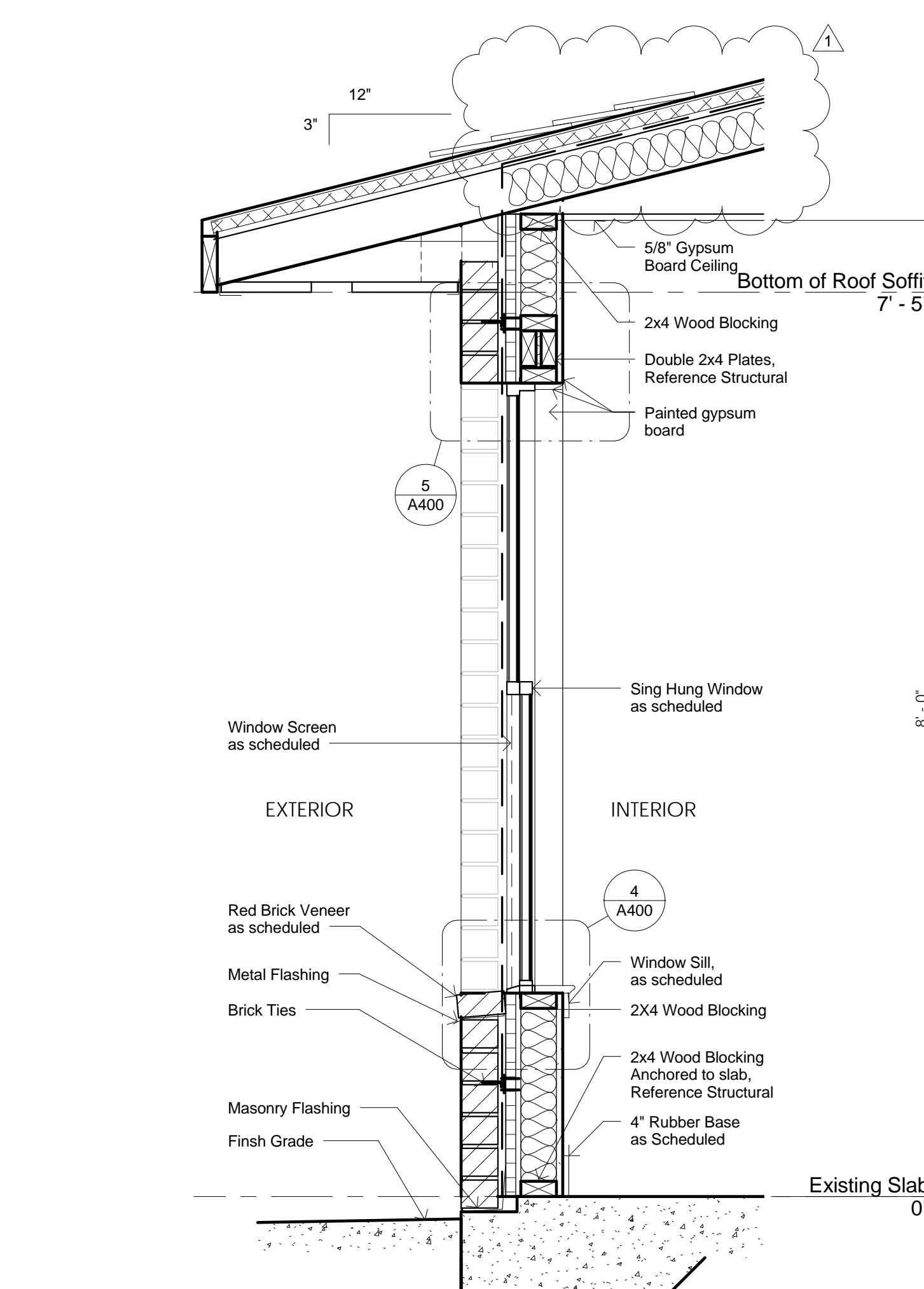
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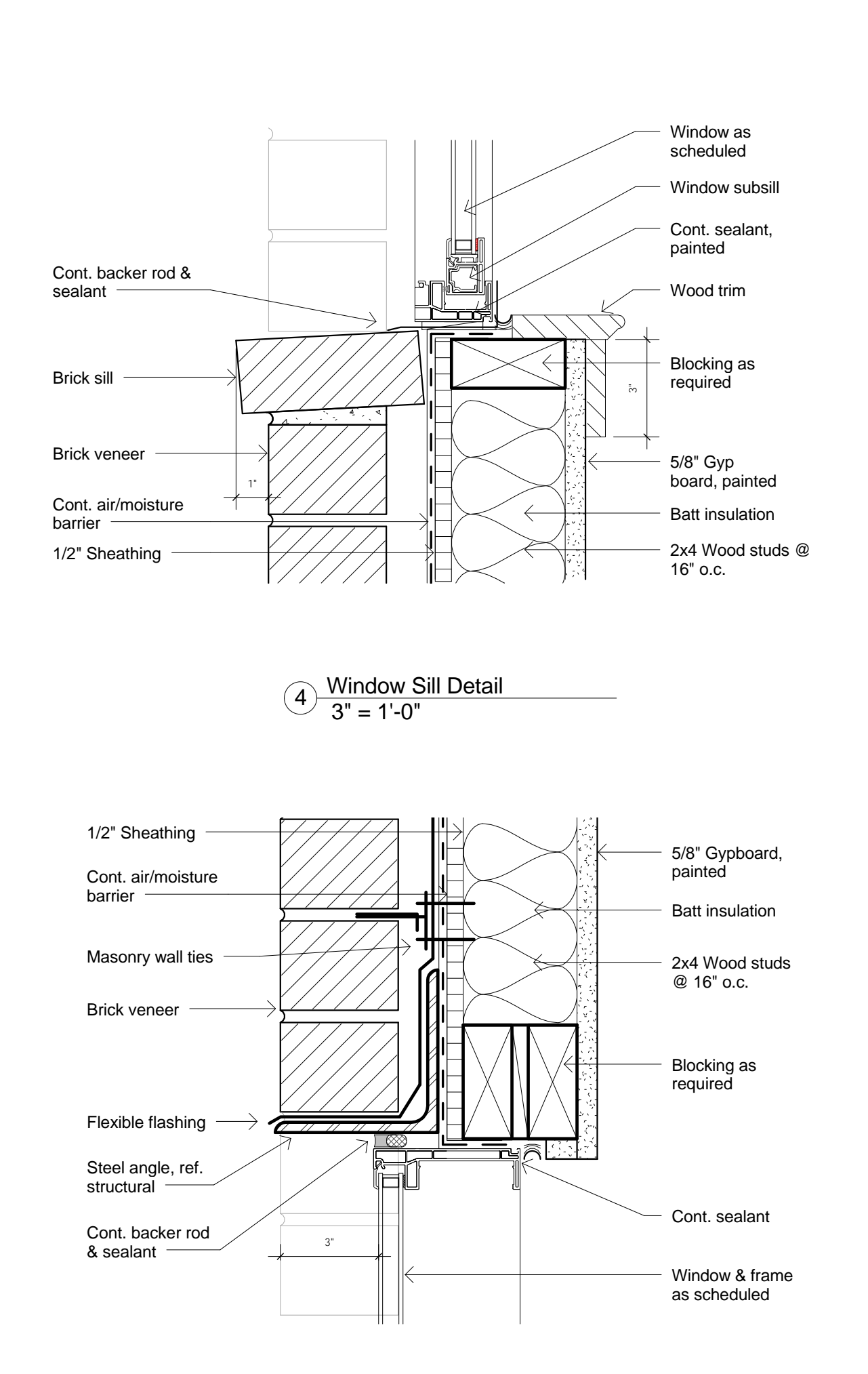
1 Wall Section thru Brick
 1" = 1'-0"



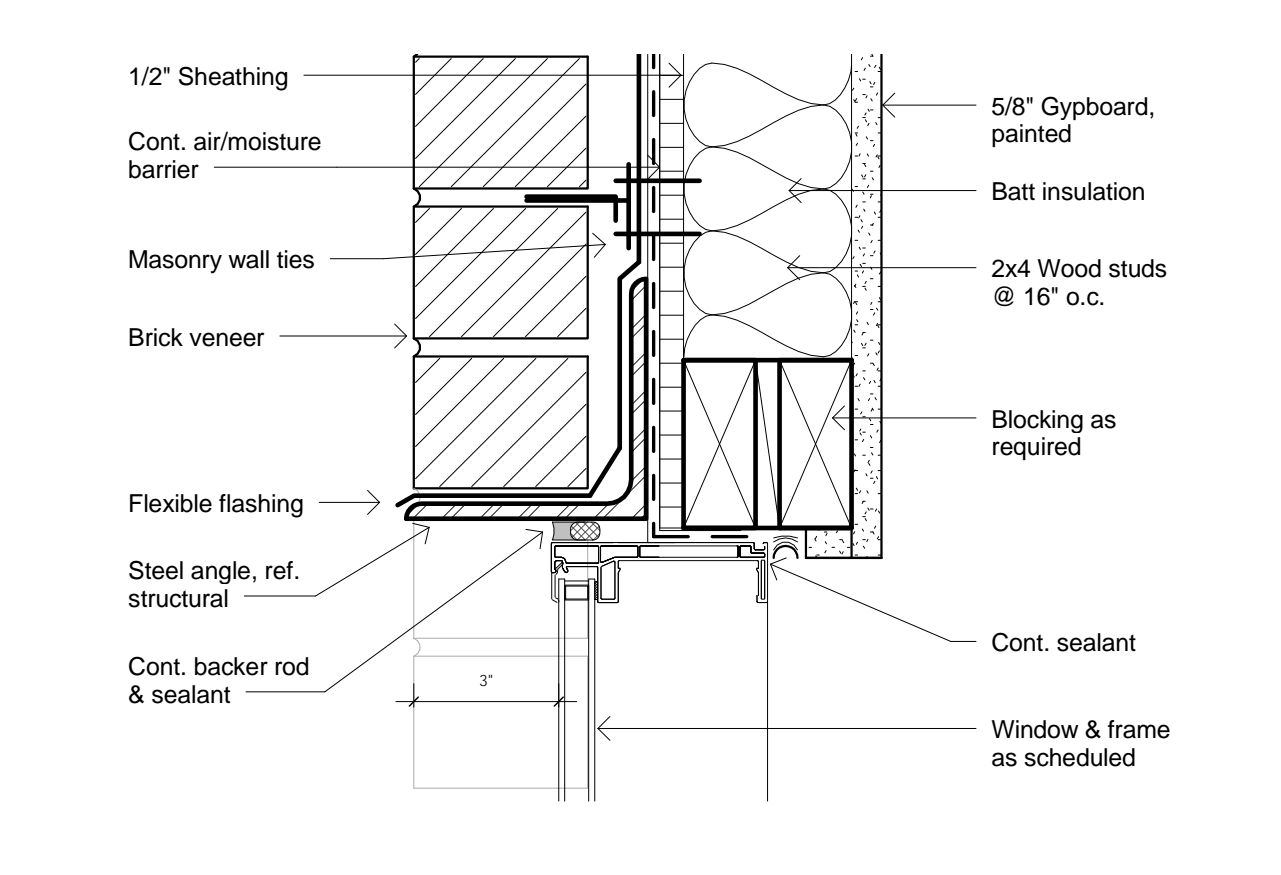
3 Wall Section thru Door
 1" = 1'-0"



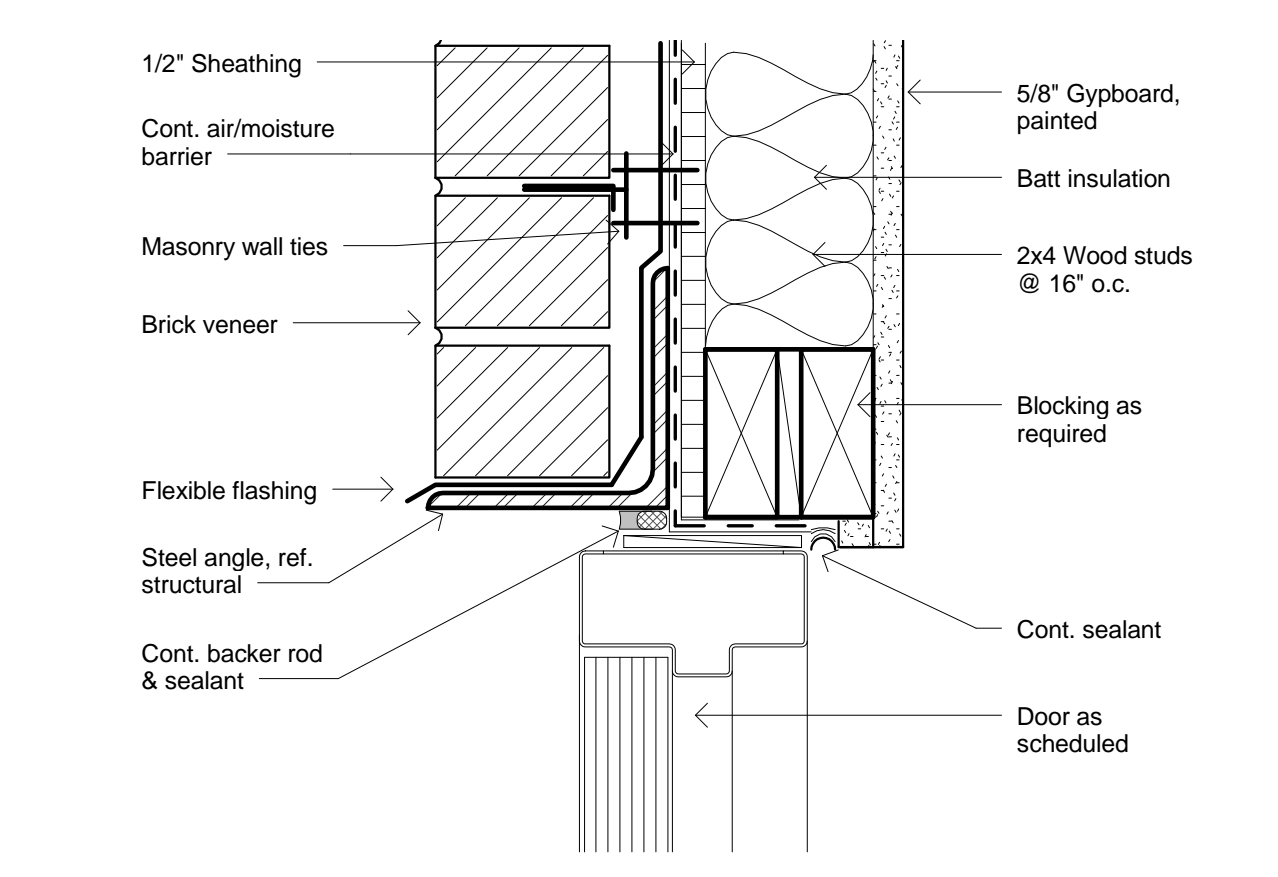
2 Wall Section thru Window
 1" = 1'-0"



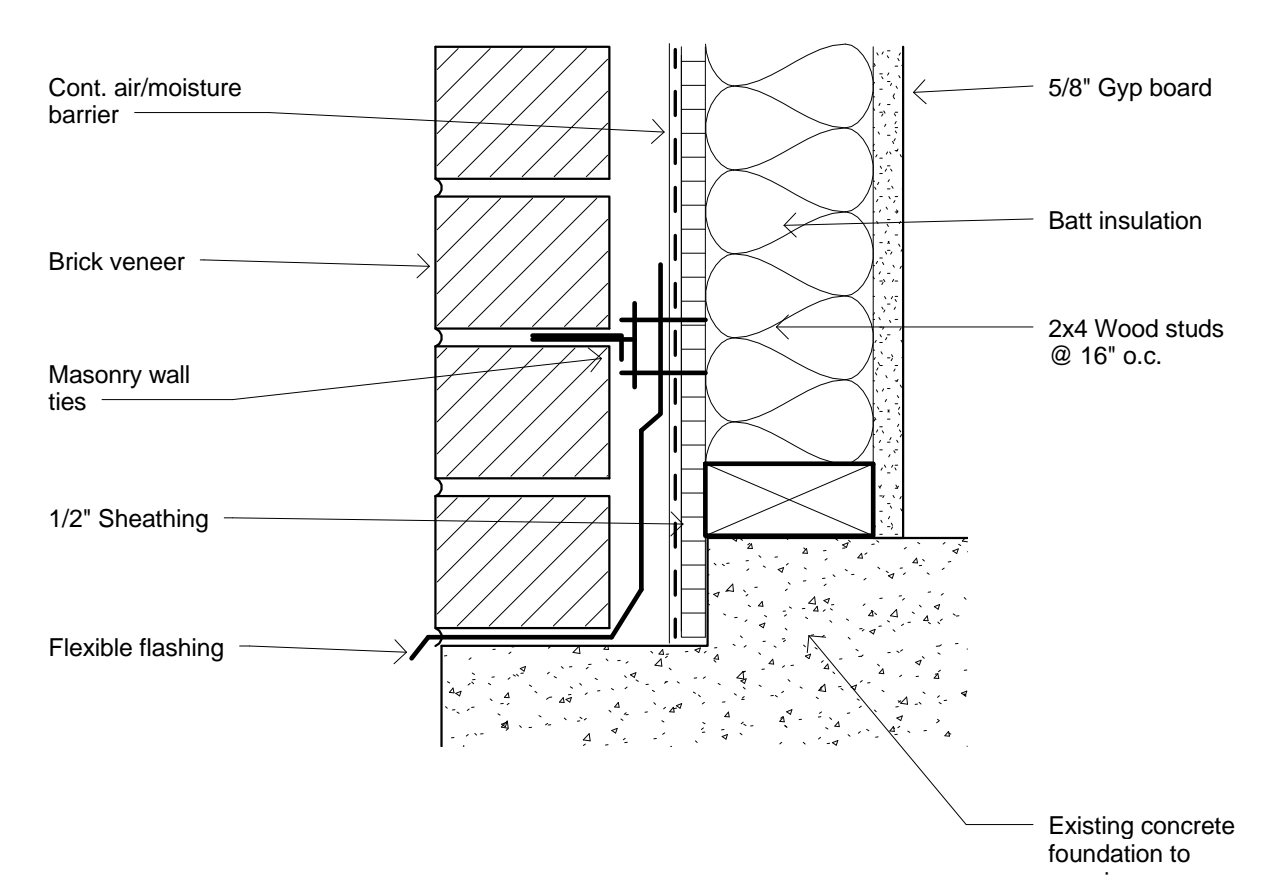
4 Window Sill Detail
 3" = 1'-0"



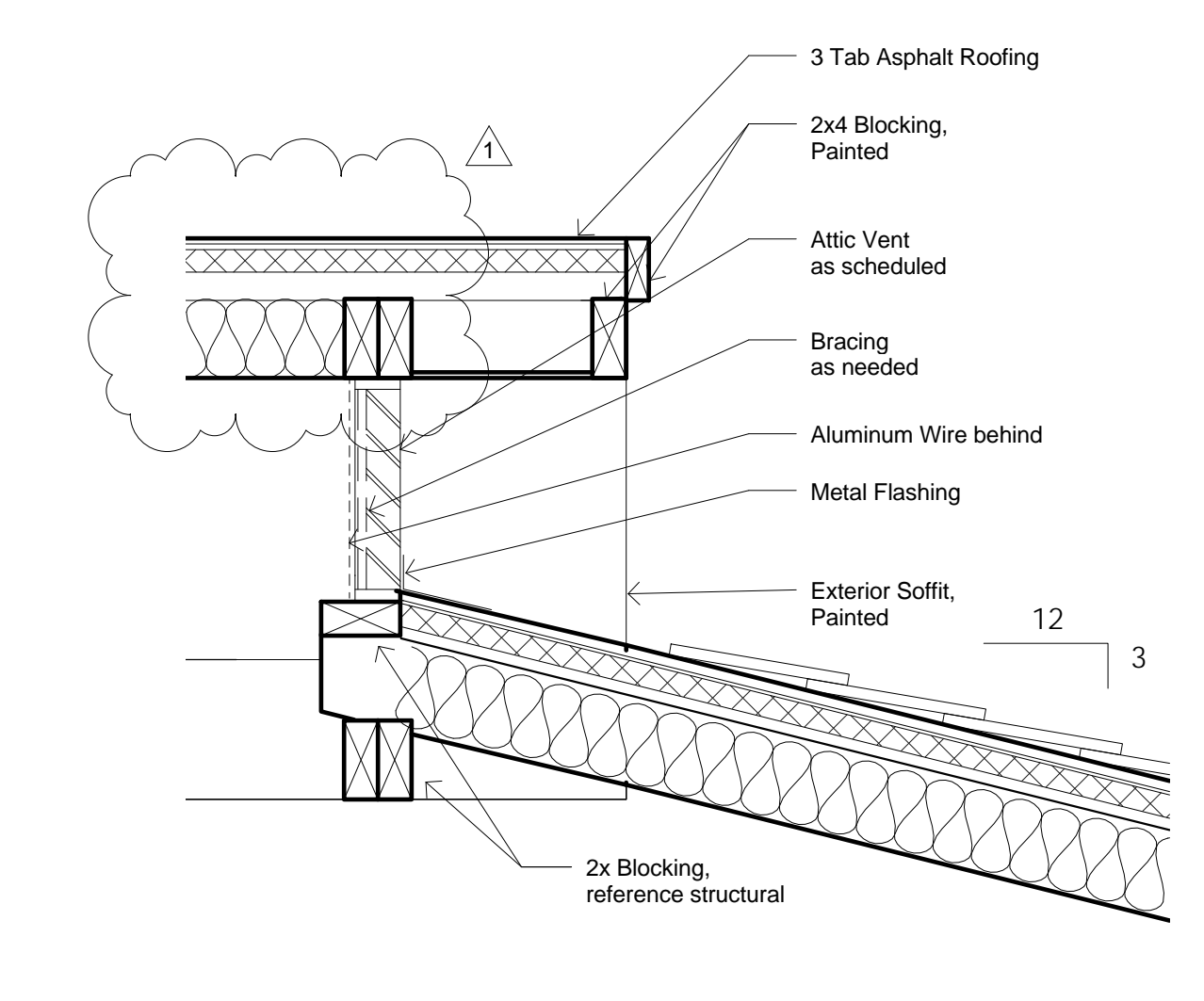
5 Window Head Detail
 3" = 1'-0"



6 Door Head Detail
 3" = 1'-0"



7 Brick Lug Detail
 3" = 1'-0"

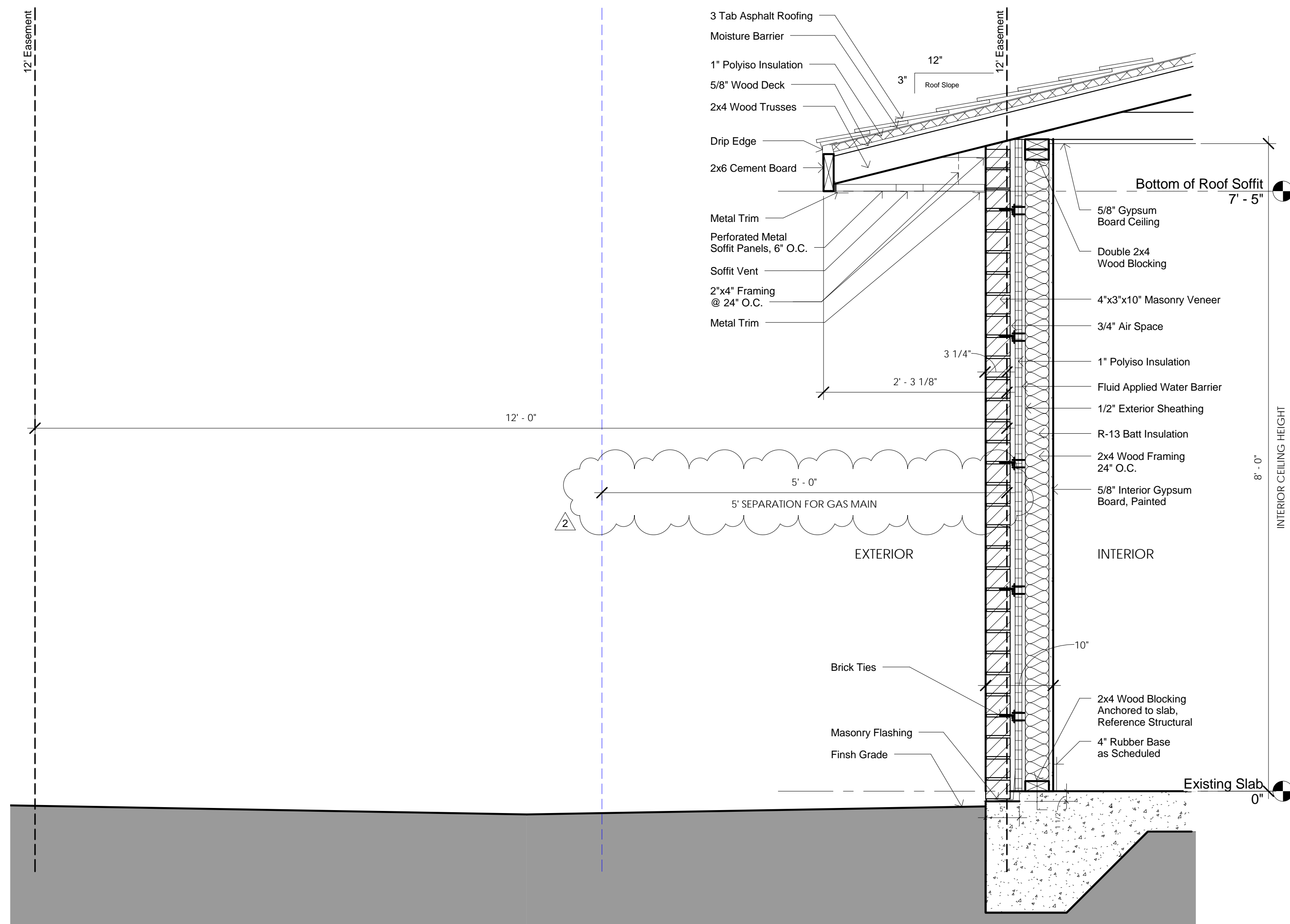


8 Roof Section thru Attic Vent
 1 1/2" = 1'-0"



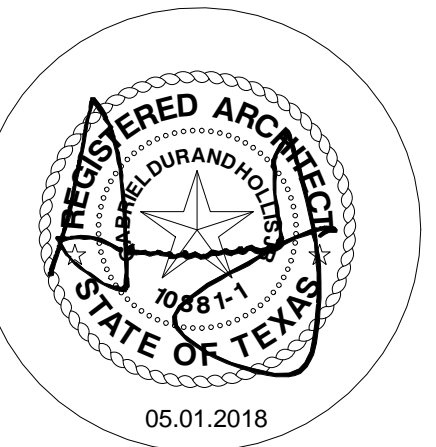
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ARCHITECTS, INC.
14603 HUEBNER RD.
BUILDING 18
SAN ANTONIO, TEXAS 78230
PHONE: 210/308-0080
FAX: 210/697-3309
eMAIL: office@dhrarchitects.com

REVISED ISSUE DATES		
NO	ISSUE	DATE
2	Revision 2	5/22/18



1 Wall Section with Easement
1" = 1'-0"

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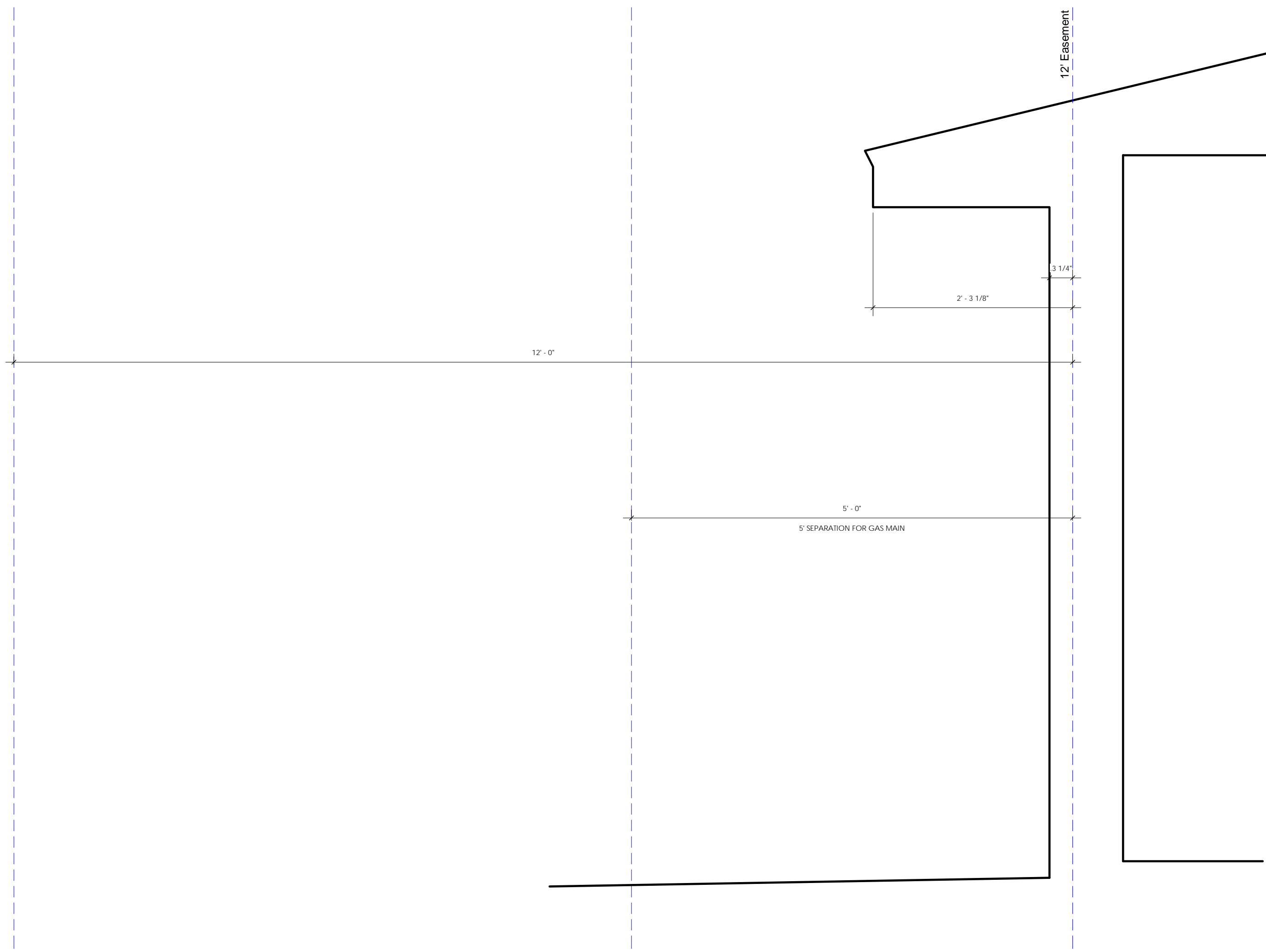


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WALL SECTION WITH EASEMENT

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A401



① SECTION PROFILE FOR EASEMENT
1" = 1'-0"



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NO	ISSUE	DATE

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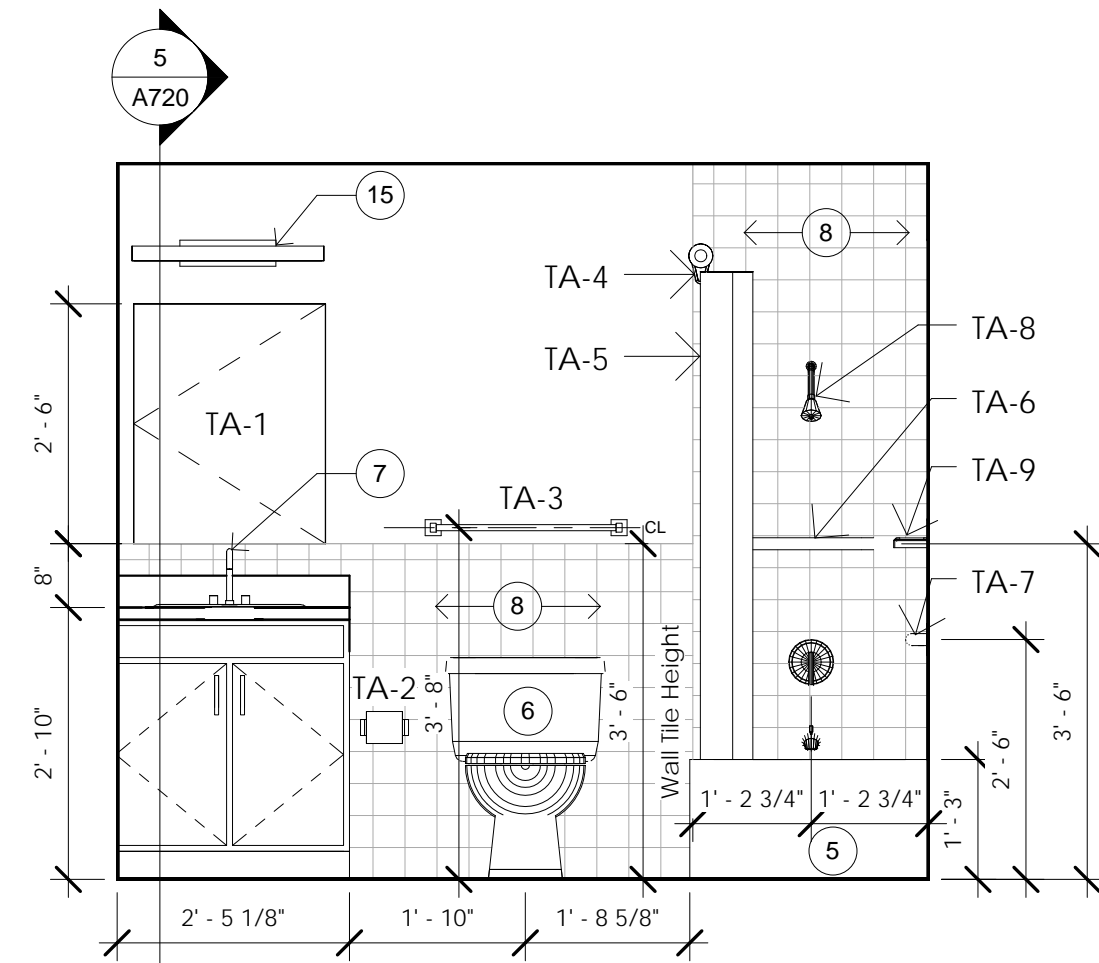


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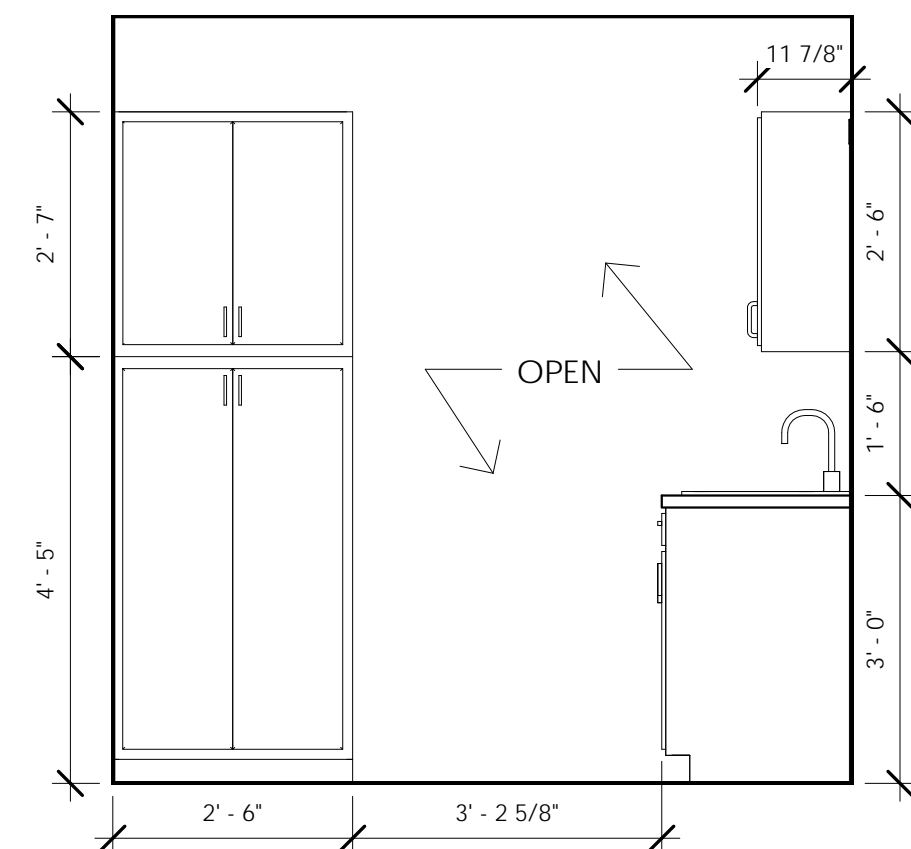
SECTION PROFILE FOR EASEMENT

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ISSUE DATE: 05/01/2018
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PROJECT ARCHITECT:

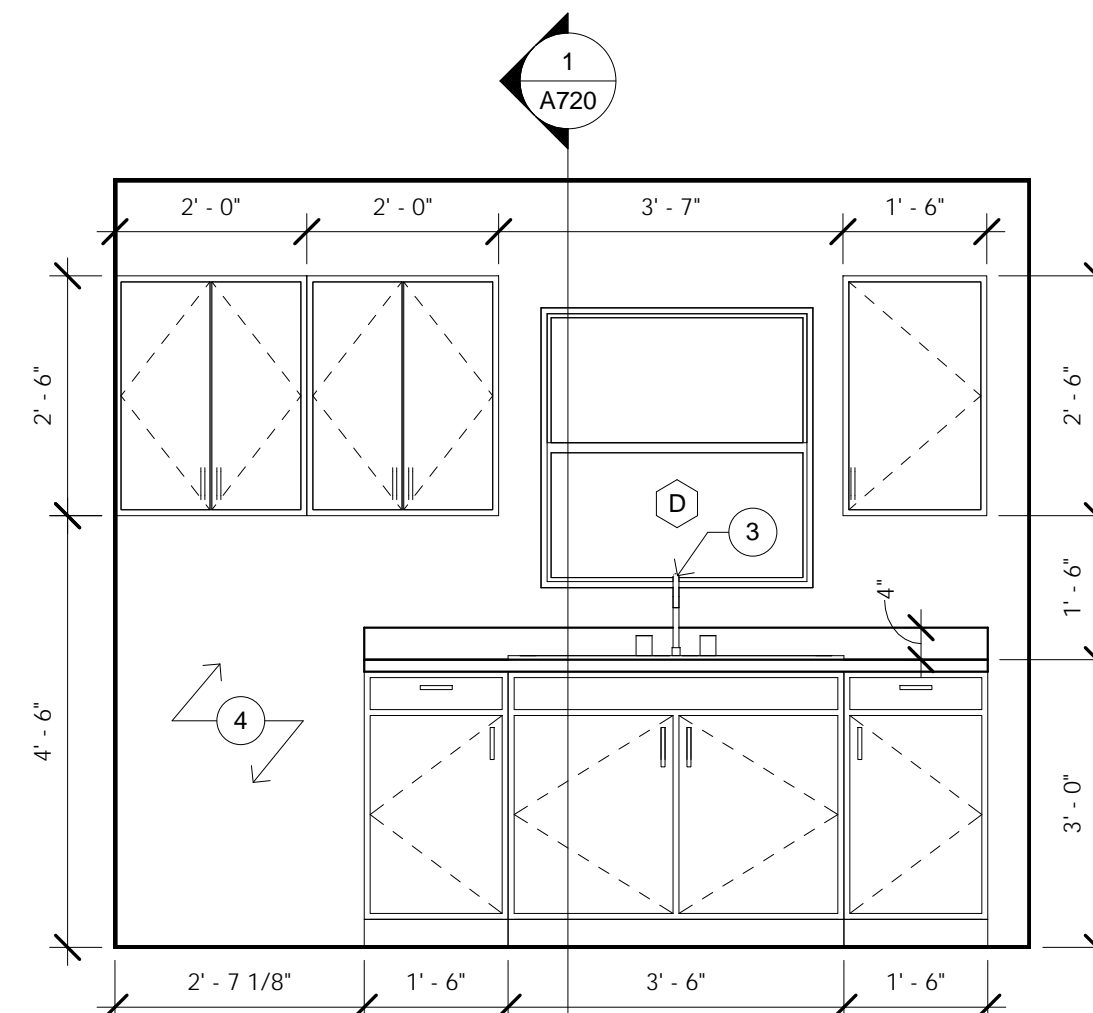
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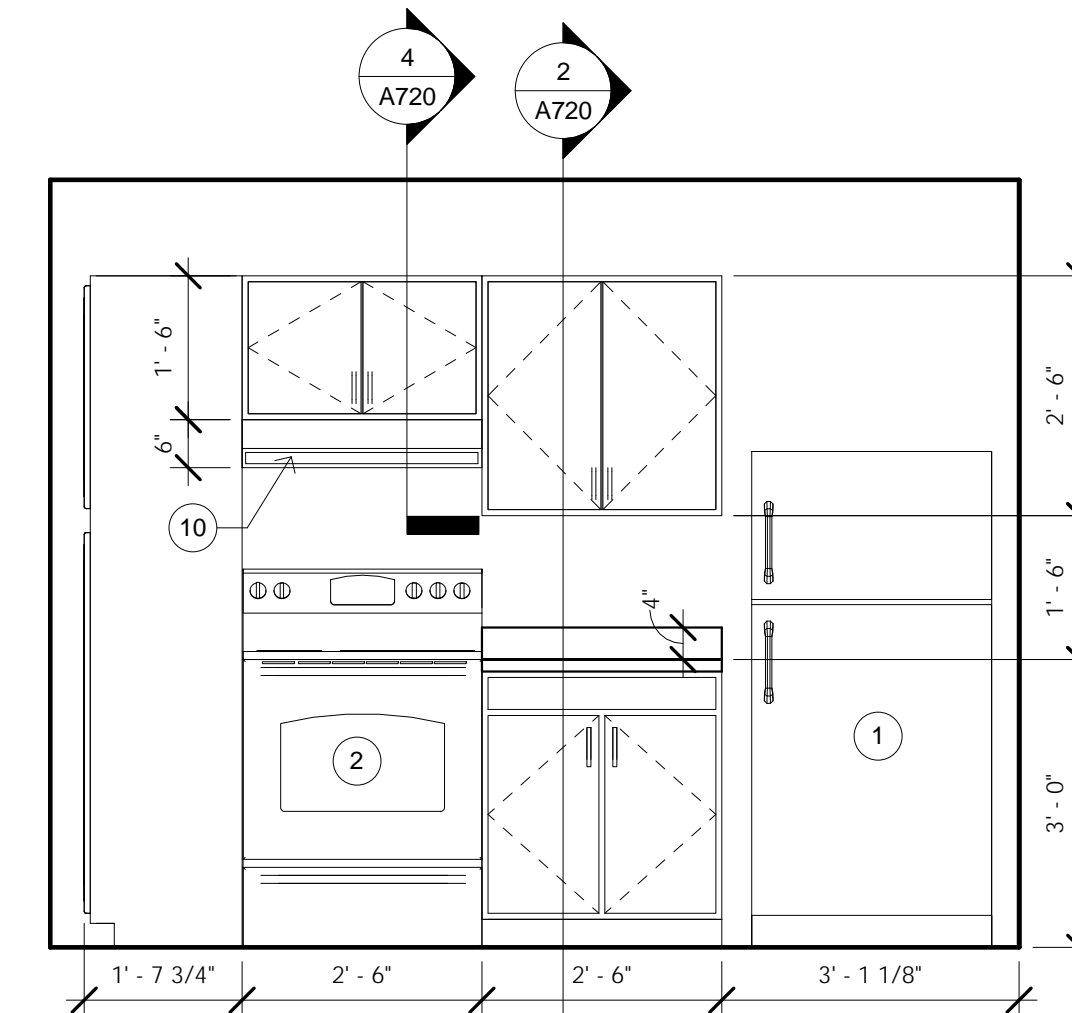
4 Elevation 1 - Bathroom
 1/2" = 1'-0"



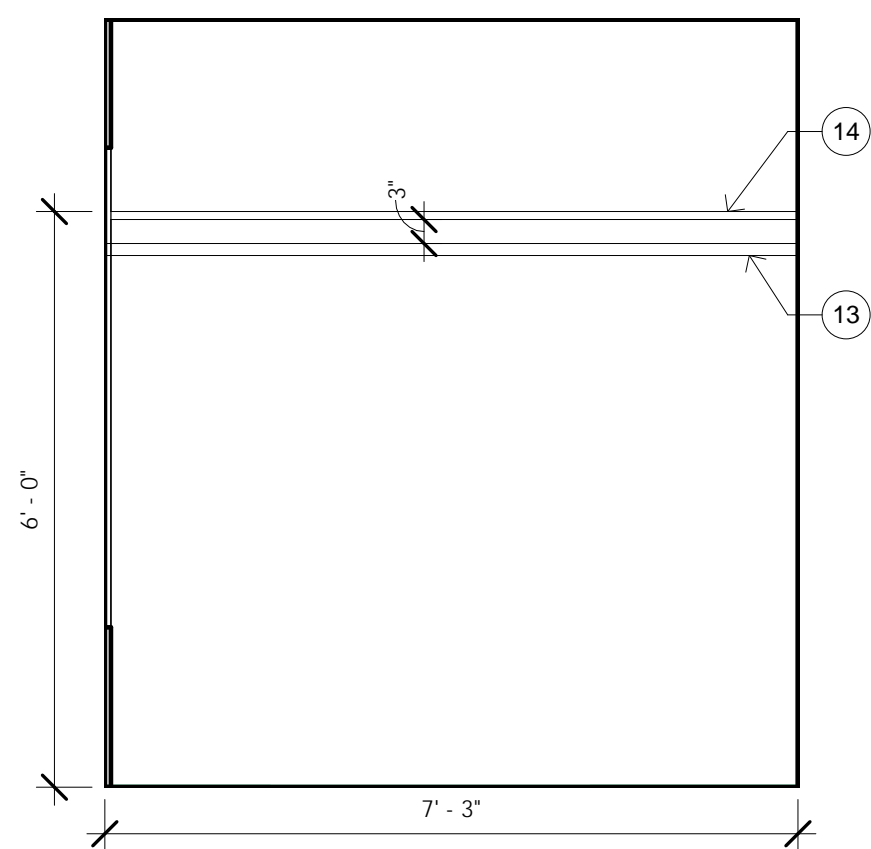
3 Elevation 3 - Kitchen
 1/2" = 1'-0"



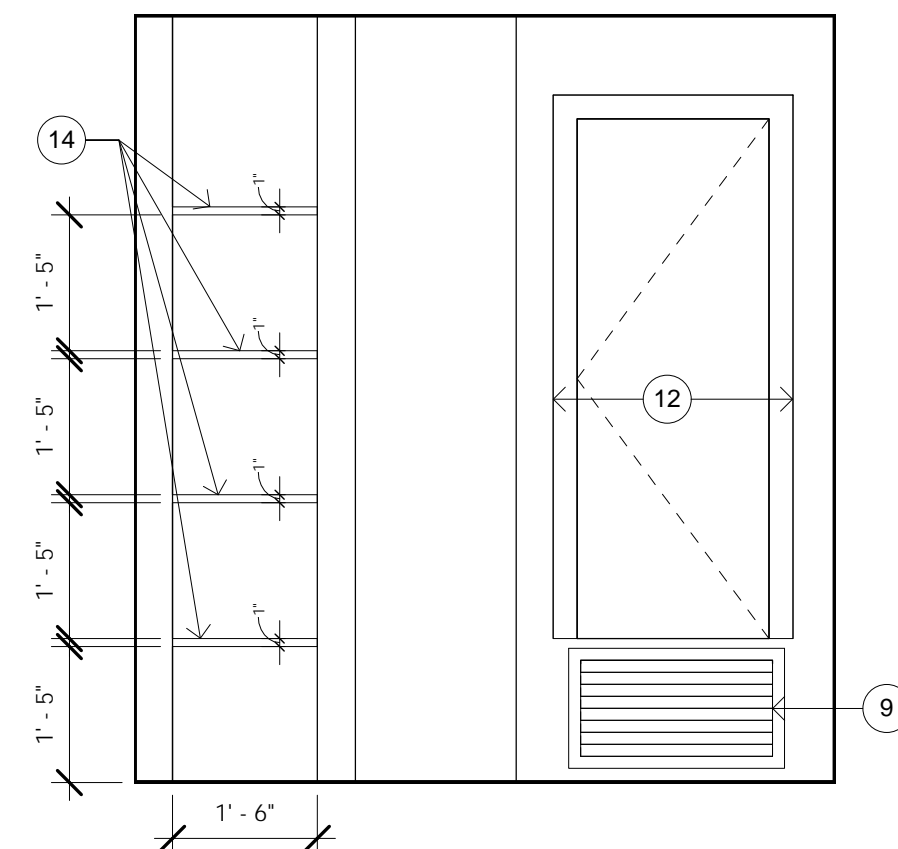
2 Elevation 2 - Kitchen
 1/2" = 1'-0"



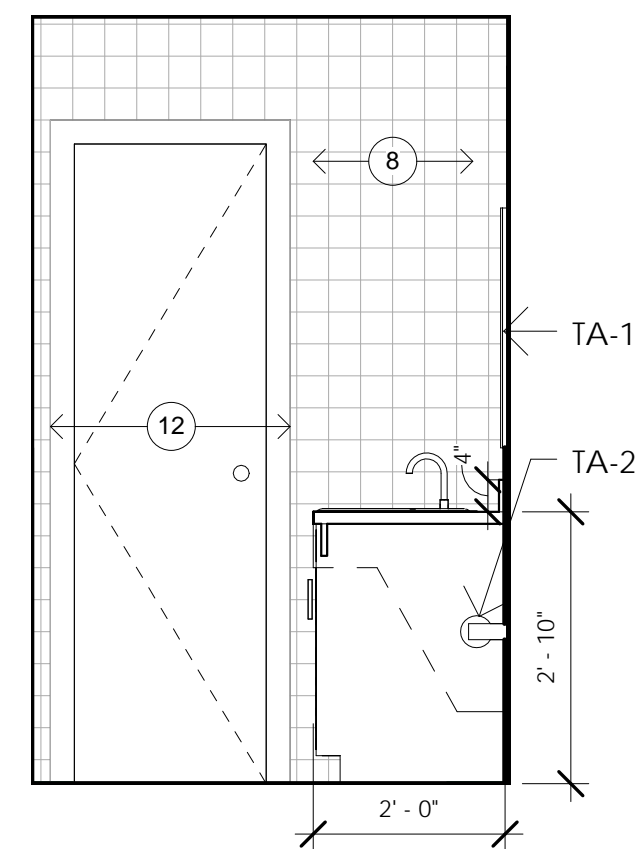
1 Elevation 1 - Kitchen
 1/2" = 1'-0"



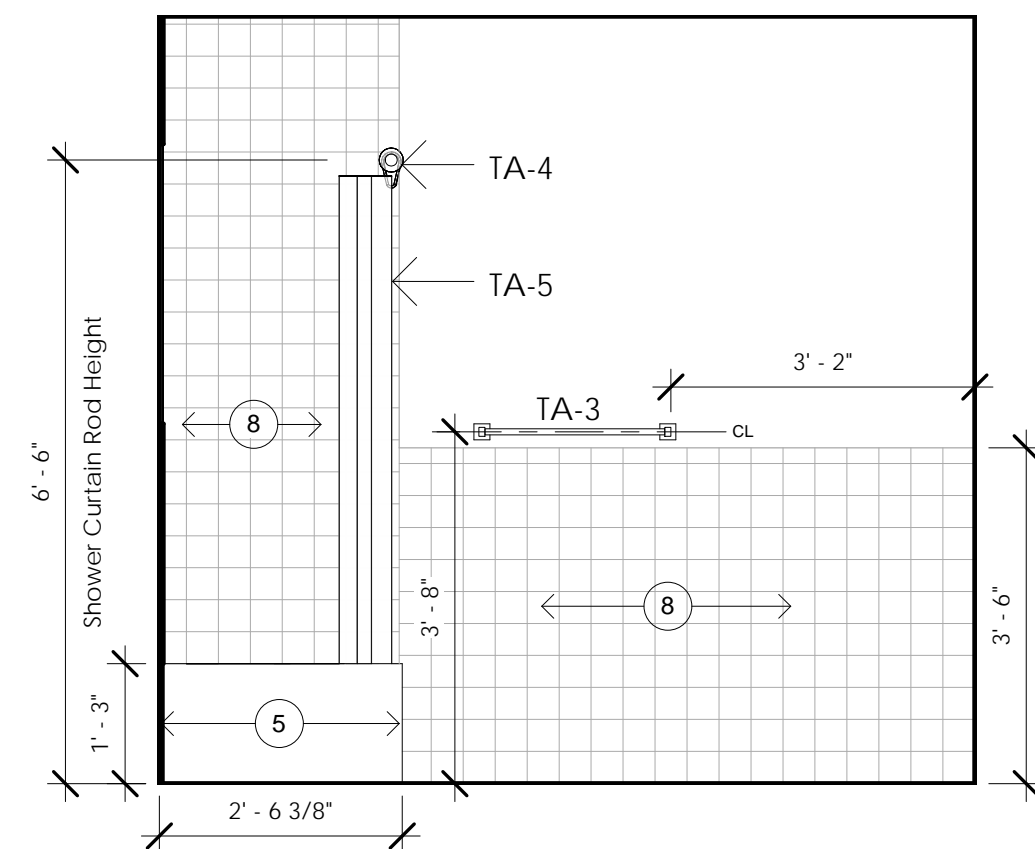
9 Elevation 1 - Shelving
 1/2" = 1'-0"



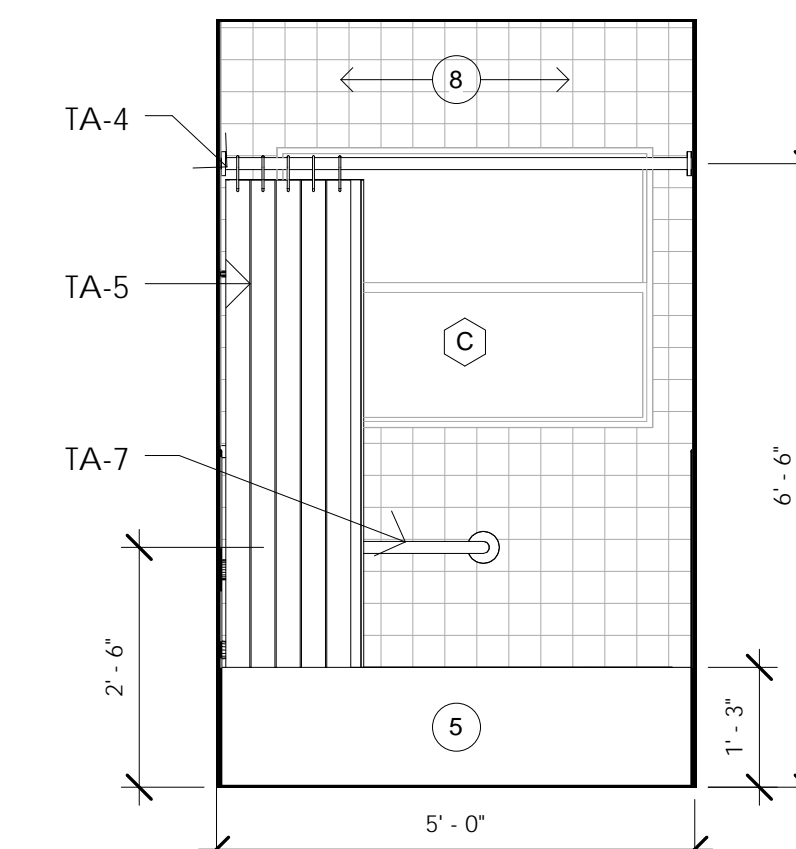
8 Elevation 1 - Closet
 1/2" = 1'-0"



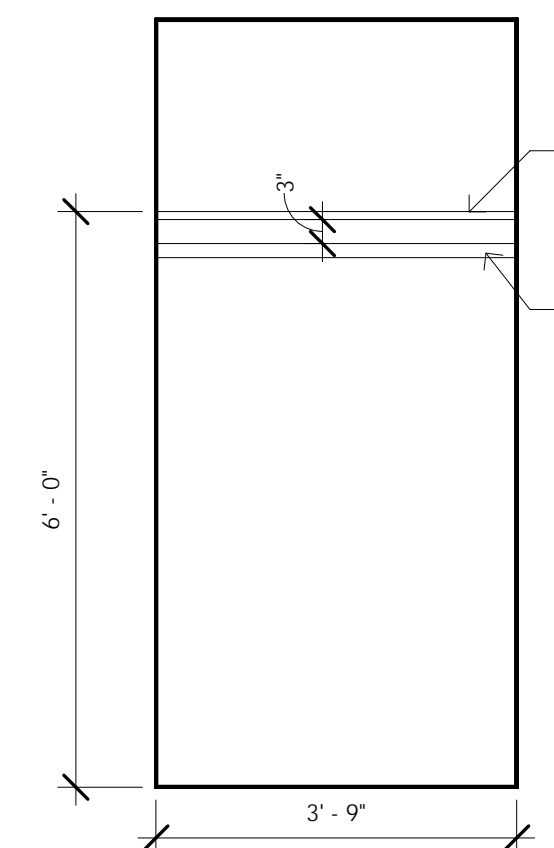
7 Elevation 4 - Bathroom
 1/2" = 1'-0"



6 Elevation 3 - Bathroom
 1/2" = 1'-0"



5 Elevation 2 - Bathroom
 1/2" = 1'-0"



10 Elevation 2 - Shelving
 1/2" = 1'-0"

GENERAL NOTES

ALL CABINET HARDWARE AS SPECIFIED.
 REFERENCE MEP FOR ALL APPLIANCES AND UTILITY CONNECTIONS.
 REFERENCE SHEET A100 FOR TOILET ACCESSORIES.

ELEVATION KEYED NOTES

1. REFRIGERATOR
2. STOVE, REFERENCE MEP
3. DOUBLE SINK. SINK TO BE CENTERED ON THE WINDOW
4. WASHER AND DRYER CONNECTIONS
5. TUB
6. WATER CLOSET
7. BATHROOM SINK
8. WALL TILE AS SCHEDULED
9. HVAC VENT, REFERENCE MEP
10. VENT HOOD, REFERENCE MEP
12. DOOR AS SCHEDULED
13. 1 1/2" CLOTHES ROD
14. 1" WOOD SHELF
15. LIGHT FIXTURE AS SCHEDULED



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 ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 EMAIL: office@dhrarchitects.com

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INTERIOR ELEVATIONS

PROJECT NO.: 17-019
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 PROJECT ARCHITECT:

GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

SHEET NO.:

A500

REVISED ISSUE DATES

NO	ISSUE	DATE

DOOR HARDWARE SET #01 - 4 total - Exterior Unit Entry				
Doors: 100, 101, 104, 105				
1	Entry Lock	J54 MAR	630	DEX
1	Deadbolt	JD80	626	DEX
1	Door Guard	482A	702	IVE
1	Door Stop	FS17	626	IVE
1	Door Viewer	U698	626	IVE
1	Deadbolt (second)	JD60	626	DEX

NOTE: BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER (MATCH HARDWARE FINISH)

DOOR HARDWARE SET #02 - 4 total - Exterior Water Closet and Storage				
Doors: 102, 103, 106, 107				
1	Passage Set	J10 MAR	630	DEX
1	Deadbolt	JD60	626	DEX
1	Crash Stop	CS115-25 X SNB	626	IVE

NOTE: BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER (MATCH HARDWARE FINISH)

DOOR HARDWARE SET #03 - 6 total - Bedroom and Bathroom				
Doors: 111, 115 (Bath)				
1	Privacy Lock	J40 MAR	630	DEX
1	Door Stop	WS406CCV	630	IVE
Doors: 109, 110, 113, 114 (Bedroom)				
1	Passage Set	J10 MAR	630	DEX
1	Door Stop	WS406CCV	630	IVE

NOTE: BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER (MATCH HARDWARE FINISH)

DOOR HARDWARE SET #04 - 2 total - Closet				
Doors: 108, 112				
1	Passage Set	J10 MAR	630	DEX
1	Door Stop	61Z	619	IVE

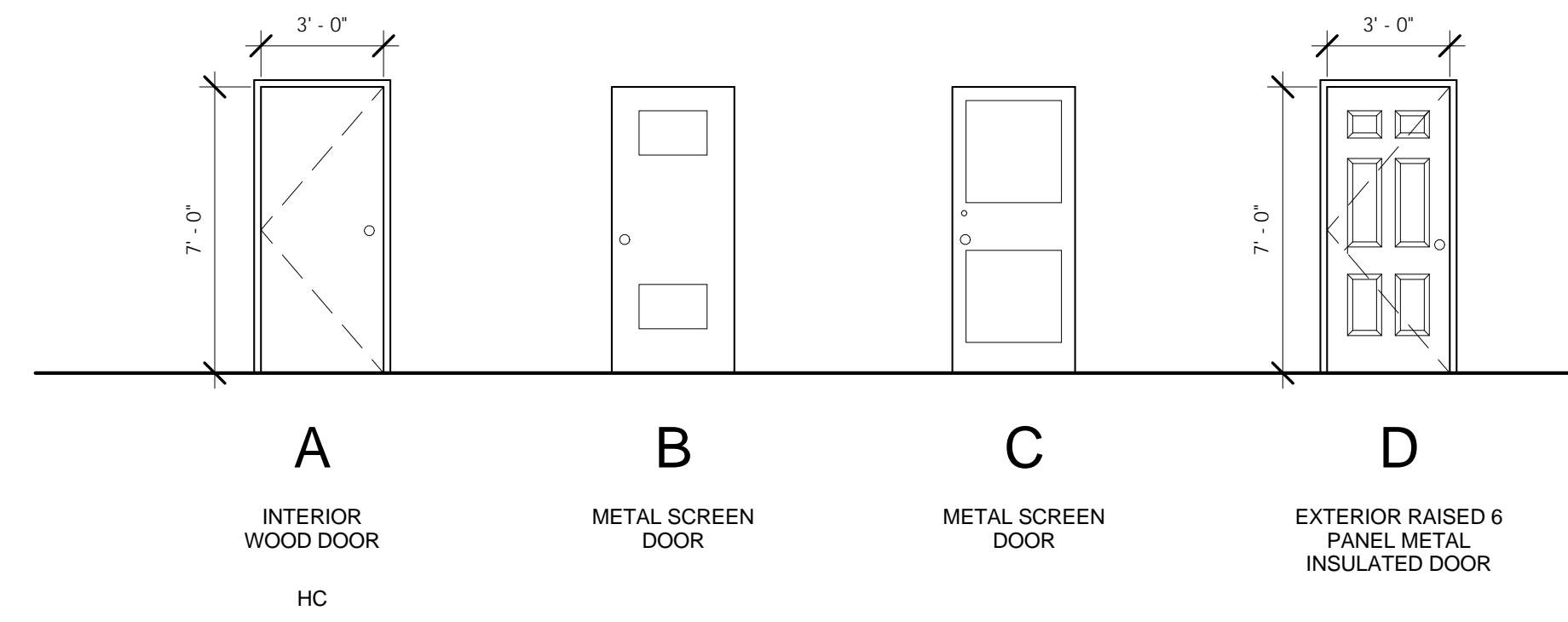
NOTE: BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER (MATCH HARDWARE FINISH)

GENERAL NOTES: (REFER TO SPEC SECTION 087100 - DOOR HARDWARE)

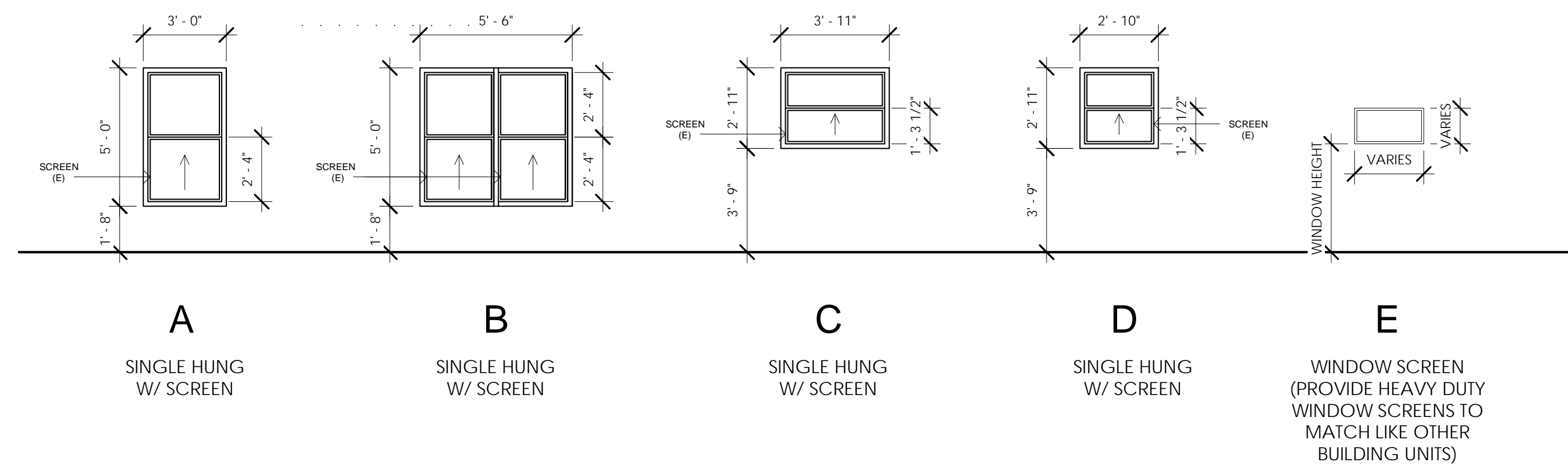
- ALL EXTERIOR DOORS ARE PRE-HUNG AND SHALL BE PROVIDED WITH HINGES, SPRING HINGES, SEALS AND THRESHOLDS BY THE PRE-HUNG DOOR AND FRAME MANUFACTURER.
- ALL INTERIOR DOORS ARE PRE-HUNG AND SHALL BE PROVIDED WITH HINGES BY THE PRE-HUNG DOOR AND FRAME MANUFACTURER. (MATCH HARDWARE FINISH.)
- VERIFY KEYING REQUIREMENTS AND PROVIDE LOCKS KEYED TO THE EXISTING SYSTEM OR AS REQUIRED BY SAN ANTONIO HOUSING AUTHORITY. (MATCH HARDWARE FINISH.)
- PROVIDE A MINIMUM ONE (1) YEAR MAINTENANCE AND THREE (3) YEAR WARRANTY ON ALL HARDWARE PRODUCTS PROVIDED.
- DOOR HARDWARE TO BE CHROME.

DOOR SCHEDULE									
NO	RM NAME	Door			FIN	FRAME		HARDWARE TYPE	COMMENTS
		H	W	L		TYPE	FIN		
100	Living Room	6'-8"	3'-0"	1 3/4"	Pre-finished	WD	PT	01	Door to have type C screen. Reference specifications.
101	Living Room	6'-8"	3'-0"	1 3/4"	Pre-finished	WD	PT	01	Door to have type C screen. Reference specifications.
102	Storage	6'-8"	3'-0"	1 3/4"		WD	PT	02	
103	WH Room	6'-8"	3'-0"	1 3/4"		WD	PT	02	Door to have type B screen. Reference specifications.
104	Dining Room	6'-8"	2'-6"	1 3/4"		WD	PT	01	Door to have type C screen. Reference specifications.
105	Dining Room	6'-8"	2'-6"	1 3/4"		WD	PT	01	Door to have type C screen. Reference specifications.
106	WH Room	6'-8"	2'-0"	1 3/4"		WD	PT	02	Door to have type B screen. Reference specifications.
107	Storage	6'-8"	3'-0"	1 3/4"		WD	PT	02	
108	Closet	5'-5"	2'-0"	1 3/4"		WD	PT	04	
109	Hallway	6'-8"	2'-6"	1 3/4"		WD	PT	03	
110	Hallway	6'-8"	2'-6"	1 3/4"		WD	PT	03	
111	Hallway	6'-8"	2'-0"	1 3/4"		WD	PT	03	
112	Closet	5'-5"	2'-0"	1 3/4"		WD	PT	04	
113	Hallway	6'-8"	2'-6"	1 3/4"		WD	PT	03	
114	Bedroom #2	6'-8"	2'-6"	1 3/4"		WD	PT	03	
115	Hallway	6'-8"	2'-0"	1 3/4"		WD	PT	03	

NOTE: FOR DOOR HARDWARE, REFERENCE SPECIFICATIONS.

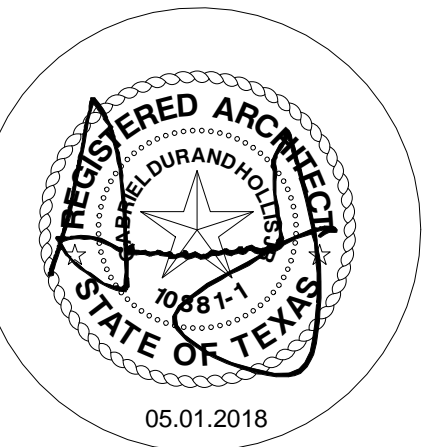


1 Door Types
1/4" = 1'-0"



2 Window Types with Screens (Vertical Sliders)
1/4" = 1'-0"

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DOOR & WINDOW SCHEDULES & DETAILS

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GABRIEL DURAND-HOLLIS, FAIA
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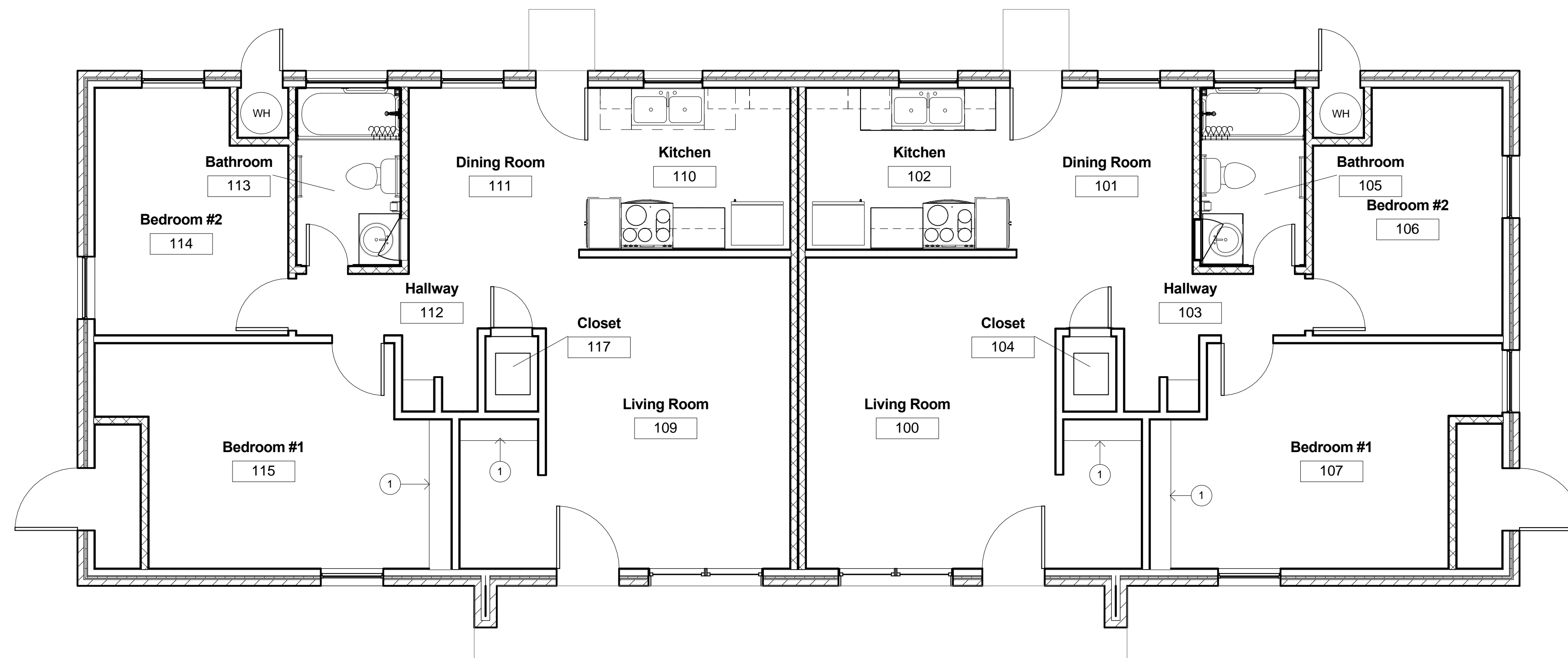
A600

GENERAL NOTES

1. PROVIDE BLOCKING AT BATH FOR FUTURE GRAB BARS BEHIND TOILETS AND AT BATH TUBS.
2. INSTALL 40" WAINSCOT IN BATHROOMS WITH 4 X 4 CERAMIC TILE.
3. BATH TUB SHOULD BE STEEL (WHITE), NOT FIBERGLASS.
4. CABINETS SHOULD MEET HUD SPEC. GC TO PROVIDE CHIP SELECTION TO DETERMINE THE BATHROOM VANITY IS THE SAME AS KITCHEN COUNTERTOPS.
5. MILLWORK TO BE STAINED. CONTRACTOR TO SUBMIT STAIN FOR APPROVAL.

FINISH PLAN NOTES

1. 1" WOOD SHELF WITH 1 METAL ROD

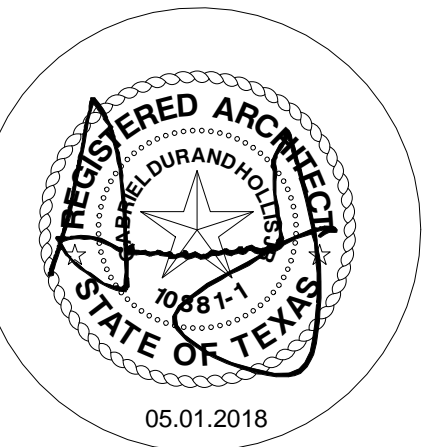


① Level 1 - Finish plan
1/4" = 1'-0"



SCHEDULE OF MATERIALS						
MATERIALS	AREA/LOCATION	VENDOR/OR APPROVED EQUAL	PATTERN NAME/NUMBER	COLOR	FINISH/SIZE	MISCELLANEOUS/NOTES
BLINDS						
	PATIO	BALI	3 1/2" VERTICLE BLIND	WHITE	N/A	1 1/2" THICK REVERSABLE STEEL HEAD RAIL, 3 1/2" ROOM DARKENING PVC VANES, 180 DEGREE VANE ROTATION, LEAD FREE, WAND CONTROL, WITH MATCHING VALANCE AND HARDWARE (INSIDE MOUNT)
	ALL AREAS	BALI	1" VINYL MINI BLIND B205	WHITE	N/A	WHITE VINYL MINI BLIND LEAD FREE - PVC HEADRAIL AND BOTTOMRAIL - MATCHING VALANCE AND HARDWARE - CUSTOM SIZED (INSIDE MOUNT)
VINYL COMPOSITION TILE						
	ALL INTERIOR FLOORS	ARMSTRONG	STANDARD EXCELON BLUE GRAY 51903	BLUE GRAY	12" X 12"	N/A
CERAMIC TILE AND GROUT						
	RESTROOM WALL TILE	DALTILE	NATURAL HUES ALMOND QHO2 GLOSS	ALMOND	4" X 4" GLOSS	INSTALL AT 90 DEGREE GROUT MFG. CUSTOM BUILDING PRODUCTS; POLY BLEND WITH MOLDGARD TECHNOLOGY; COLOR ALABASTER
MOULDING						
	ALL AREAS	ROPPE	BISQUE 131	BISQUE	4"	N/A
LATEX PAINT						
	INTERIOR WALLS	PPG	DOWN TO EARTH WHITE CHIP PPG 15-27	BOTANY BEIGE	EGGSHELL	1 PRIMER, 2 COATS
	INTERIOR TRIM	PPG	DOWN TO EARTH WHITE CHIP PPG 15-06	WHITE CHIP	SEMI-GLOSS	ALL MOULDINGS, DOORS, AND CASING TO BE PAINTED SEMI-GLOSS
	INTERIOR CEILING	PPG	SILVER FEATHER PPG 1002-1	WHITE	FLAT	ALL CEILINGS TO BE PAINTED FLAT
	EXTERIOR WALL PAINT					MATCH EXISTING
	EXTERIOR TRIM PAINT					MATCH EXISTING
NOTE** BATHROOM, VANITY AREA, LAUNDRYROOM & KITCHEN WALLS AND CEILINGS PAINT WILL HAVE ADDITIVE TO PREVENT MOLD AND MILDEW						
PLASTIC LAMINATE						
	KITCHEN AND BATHROOM COUNTERTOPS	WILSONART	STANDARD 1530-60	BEIGE	MATTE FINISH	FULL WRAP BULL NOSE EDGE 4" COVE BACKSPLASH 9USE CONTINUOUS SHEET OF PLASTIC LAMINATE AND ROLL FROM FLAT DECK UP THE VERTICLE BACKSPLASH)
NOTE:	<ol style="list-style-type: none"> 1. ALL MATERIALS LISTED TO BE SUPPLIED AND INSTALLED BY THE GENERAL CONTRACTOR. 2. ALL SPECIFIED MATERIALS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDED INSTALLATION METHODS. 3. ALL WALL AND CEILING FINISH TO BE LIGHT ORANGE PEEL TEXTURE. 					

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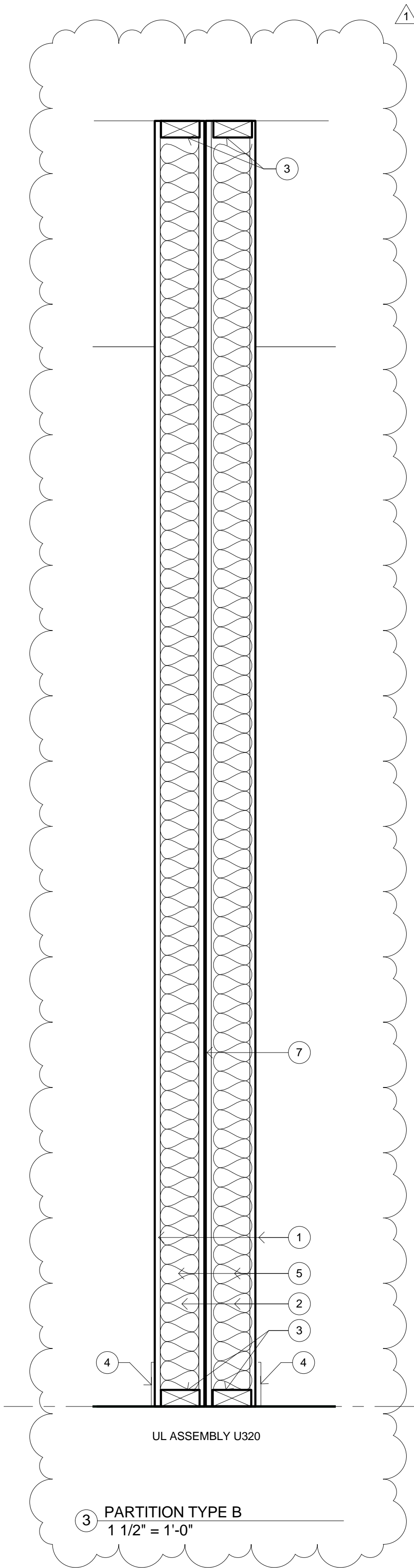
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ROOM FINISH PLAN & SCHEDULES

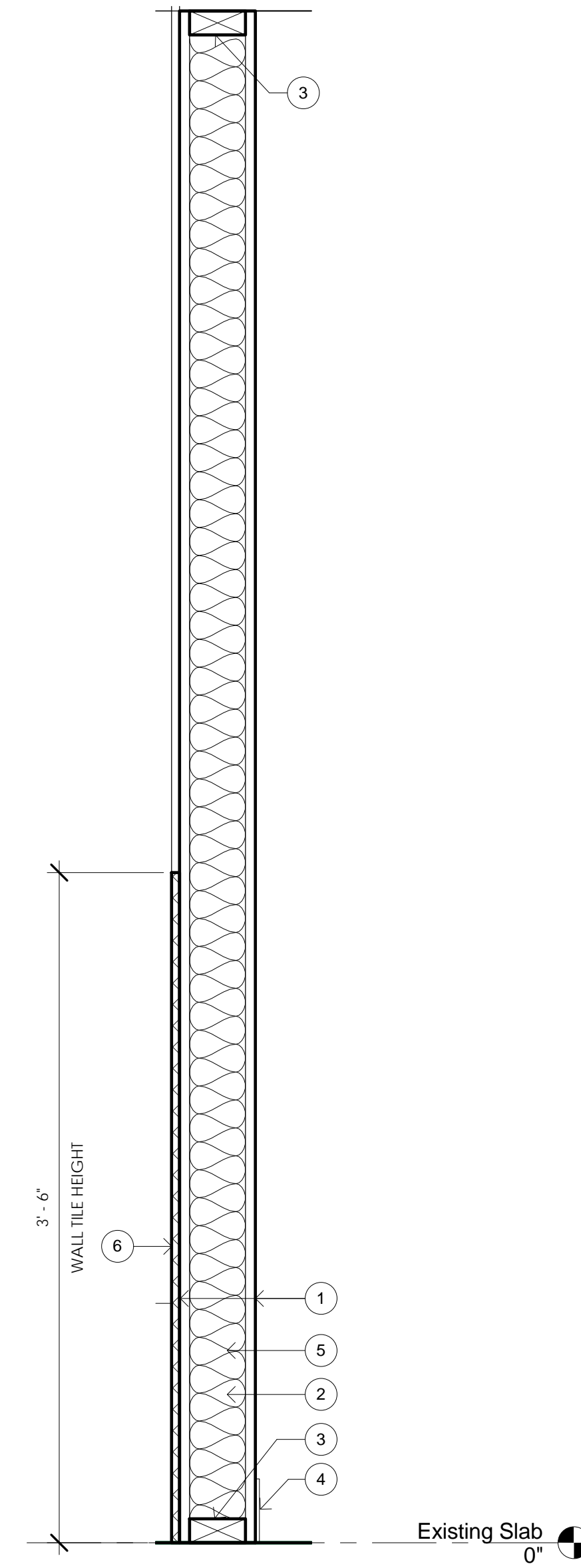
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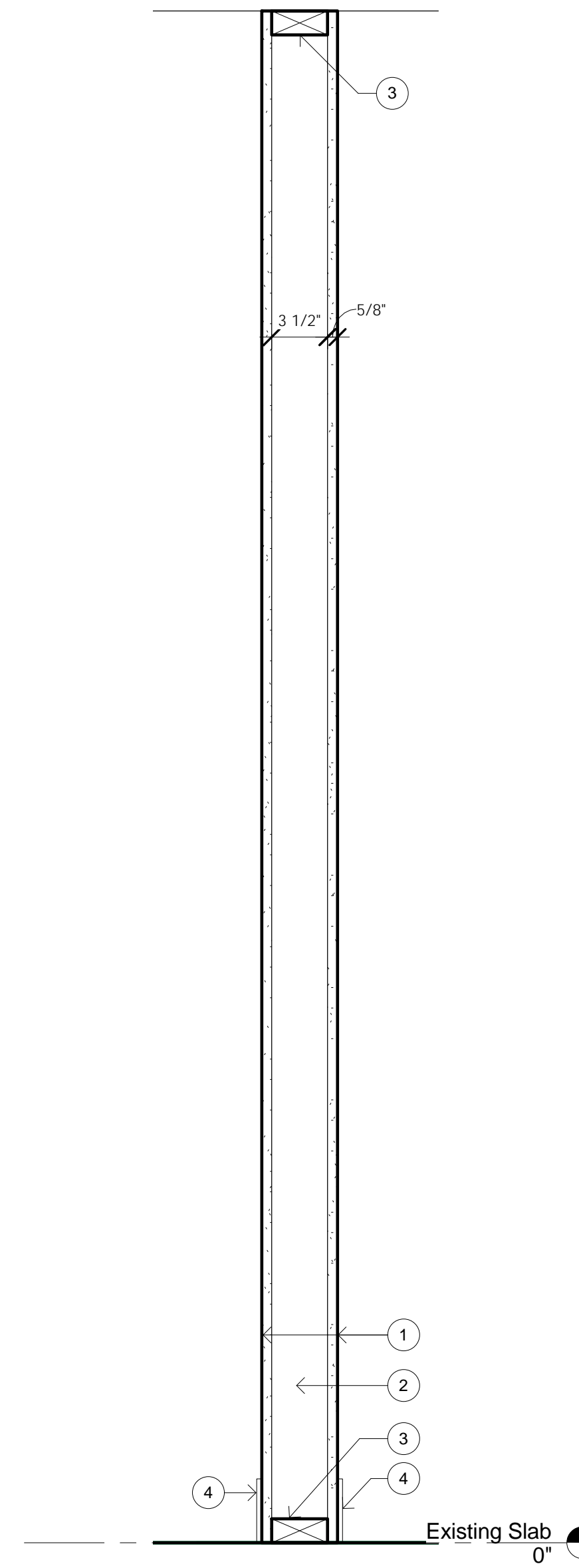
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3 PARTITION TYPE B
 1 1/2" = 1'-0"



2 PARTITION TYPE A-1
 1 1/2" = 1'-0"



1 PARTITION TYPE A
 1 1/2" = 1'-0"

INTERIOR PARTITION NOTES

1. 1/2" INTERIOR GYPSUM BOARD, PAINTED ON BOTH SIDES
2. 3 1/2" WOOD STUD 24" O.C.
3. 2X WOOD BLOCKING
4. 4IN WALL RUBBER BASE ON BOTH SIDES AS SCHEDULED
5. BATT INSULATION
6. WALL TILE AS SCHEDULED
7. 2 LAYERS OF 1/2" GYPSUM BOARD



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 PHONE: 210/308-0080
 FAX: 210/697-3309
 eMAIL: office@dhrarchitects.com

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INTERIOR WALL TYPES & DETAILS

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A700

GENERAL NOTES

CABINET CONSTRUCTION FOR HUD SEVERE USE

HUD KITCHEN CABINETS USE SOLID HARDWOOD MATERIAL AND MEET "SEVERE USE" SPECIFICATIONS.

CABINETS TO BE TESTED & CERTIFIED BY THE KITCHEN CABINET MANUFACTURERS ASSOCIATION.

MANUFACTURERS ASSOCIATION (KCMA) DEVELOP NATIONAL PERFORMANCE STANDARD, ANSI/KCMA A161.1 & NATIONALLY RECOGNIZED TESTING & CERTIFICATION PROGRAM UTILIZING INDEPENDENT LABORATORIES.

CABINET CONSTRUCTION MEETS THE HUD-SEVERE USE CRITERIA & REFERENCES ANSI/HPMA HP 1983.

CABINET CONSTRUCTION CRITERIA

FACE FRAMES - 3/4" KILN DRIED HARDWOOD WITHOUT KNOTS & CHOSEN FOR TIGHT UNIFORM COLOR, MAKING IT FIT FOR A NATURAL FINISH.

THE FRAMES ARE TO BE GLUED, SCREWED, FILLED AND SANDED FOR LONG-TERM STRENGTH & RIGIDITY. THE STILES MUST BE 2 INCHES WIDE & MULLS 2 INCHES MIN. RAILS 2 INCHES WIDE. ALL EDGES SHALL BE ROUNDED, NO SHARP CORNER.

END PANELS - THE EXPOSED ENDS OF THE CABINETS TO BE MADE OF 2-2 GRADE, 1/2 IN THICK 5-PLY HARDWOOD PLYWOOD. THE CABINET ENDS THAT ARE NOT EXPOSED - 1/2 IN SOFTWOOD PLYWOOD.

BACK PANELS - 1/4" PLYWOOD IS GLUED OR NAILED OR STAPLED STRONGLY & SECURELY TO CABINET CLEATS, ENDS AND SHELVES.

WALL CABINET BOTTOMS - 1/2 IN PLYWOOD WITH A FRONT EDGE HARDWOOD BANDED.

BASE BOTTOMS - 1/2 IN PLYWOOD 2-2 GRADE PLYWOOD. THE BOTTOM SHALL BE HELD UP BY 3/4 IN THICK TROUGH LUMBER BRACES THAT ARE PRESSURE TREATED.

DRAWERS - THE FRONT PROFILE OF THE DRAWERS SHOULD MATCH THE DOOR'S PROFILE. THE SIDE & BACK PORTIONS TO BE CONSTRUCTED OF MIN. 1 1/2 IN SOLID LUMBER WITH 4 SIDED DRAWER BOX THAT IS MADE WITH LOCKING JOINTS.

FRONT OF DRAWERS - SCREWED & GLUED TO THE DRAWER BOX & THE BOTTOM MUST BE DADOED INTO THE 4 SIDES.

BOTTOM OF DRAWERS - 1/4" PLYWOOD MIN. ALL PARTS TO BE GLUED & STAPLED OR NAILED TOGETHER. THE DRAWERS TO BE MOUNTED ON A PAIR OF METAL SIDE RAILS THAT ARE BALL-BEARING & WITH 75 LB. CAPACITY.

HARDWARE - MUST BE CORROSION RESISTANT. ALL HINGES TO BE FULL-WRAP, PARTIALLY-CONCEALED.

FINISH - THE EXPOSED SURFACES & INTERIOR SHOULD BE FACTORY FINISHED. SUBMIT COLOR STAIN FOR APPROVAL

COUNTERTOPS - POST SHAPED, HIGH-PRESSURE PLASTIC LAMINATED TO 3/4" PLYWOOD. THE ENDS & COUNTERTOP'S BOTTOM FRONT EDGE MUST HAVE A FIRM WOOD MOULD. THE EDGE OF THE COUNTERTOP MUST BE NO-DRIP.

REQUIREMENTS FOR EARNING THE KCMA CERTIFICATION SEAL

ALL CABINETS MUST BE FULLY ENCLOSED WITH BACKS, BOTTOMS, SIDES, & TOPS ON WALL CABINETS; & BACKS, BOTTOMS & SIDES ON BASE CABINETS, WITH CERTAIN SPECIFIED EXCEPTIONS ON KITCHEN SINK FRONTS, SINK BASES, OVEN CABINETS & REFRIGERATOR CABINETS. ALL CABINETS DESIGNED TO REST ON THE FLOOR MUST BE PROVIDED WITH A TOE SPACE AT LEAST 2 IN DEEP & 3 IN HIGH.

ALL UTILITY CABINETS MUST MEET THE SAME CONSTRUCTION REQUIREMENTS AS WALL CABINETS.

DOORS MUST BE PROPERLY ALIGNED, HAVE MEANS OF CLOSURE, AND CLOSE WITHOUT EXCESSIVE BINDING OR LOOSENESS.

ALL MATERIALS MUST ENSURE RIGIDITY IN COMPLIANCE WITH PERFORMANCE STANDARDS.

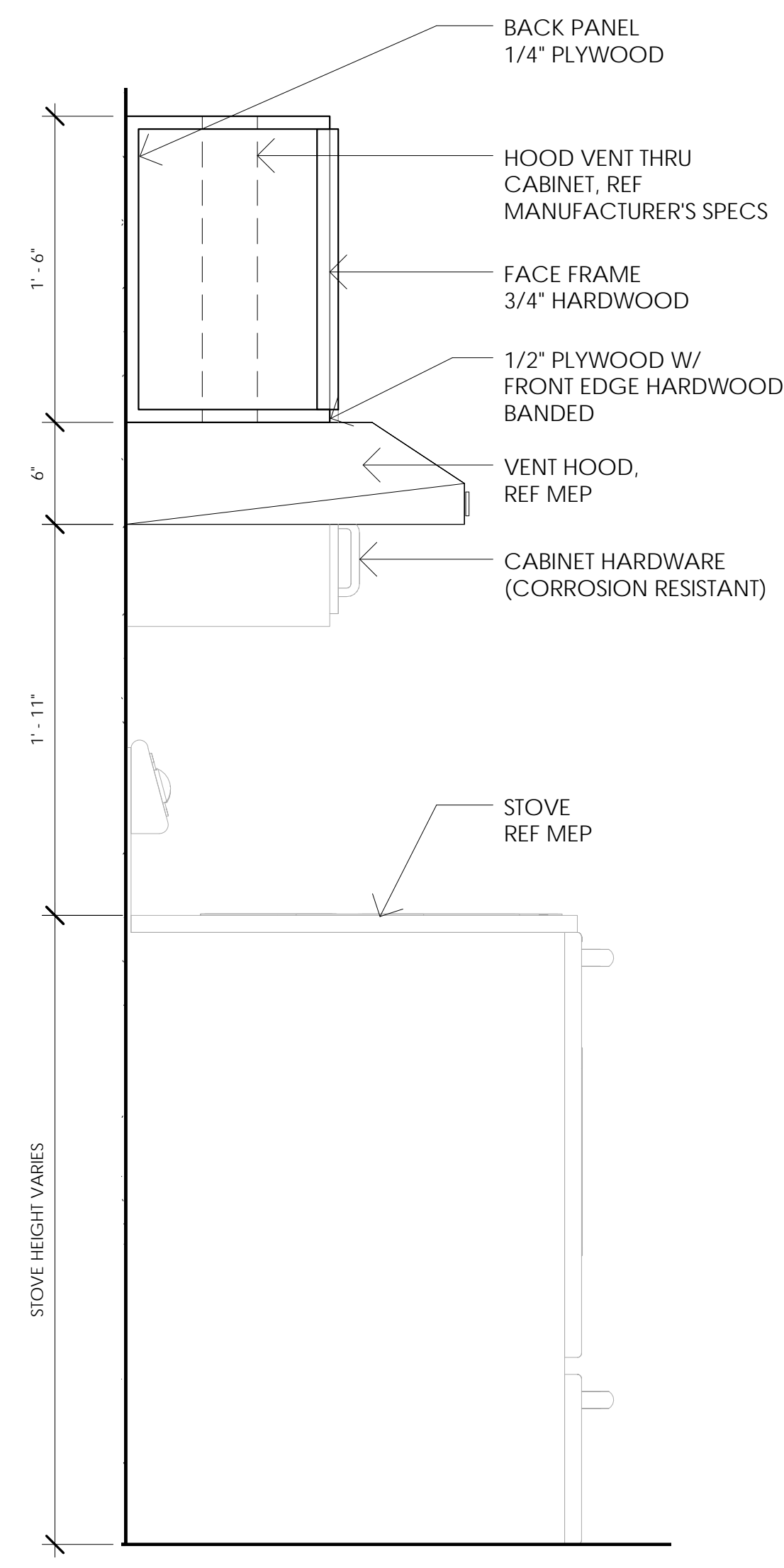
FACE FRAMES, WHEN USED, MUST PROVIDE RIGID CONSTRUCTION.

FOR FRAMELESS CABINETS, THE ENDS, TOPS/BOTTOMS, AND BACK SHALL BE OF THICKNESS NECESSARY TO PROVIDE RIGID CONSTRUCTION.

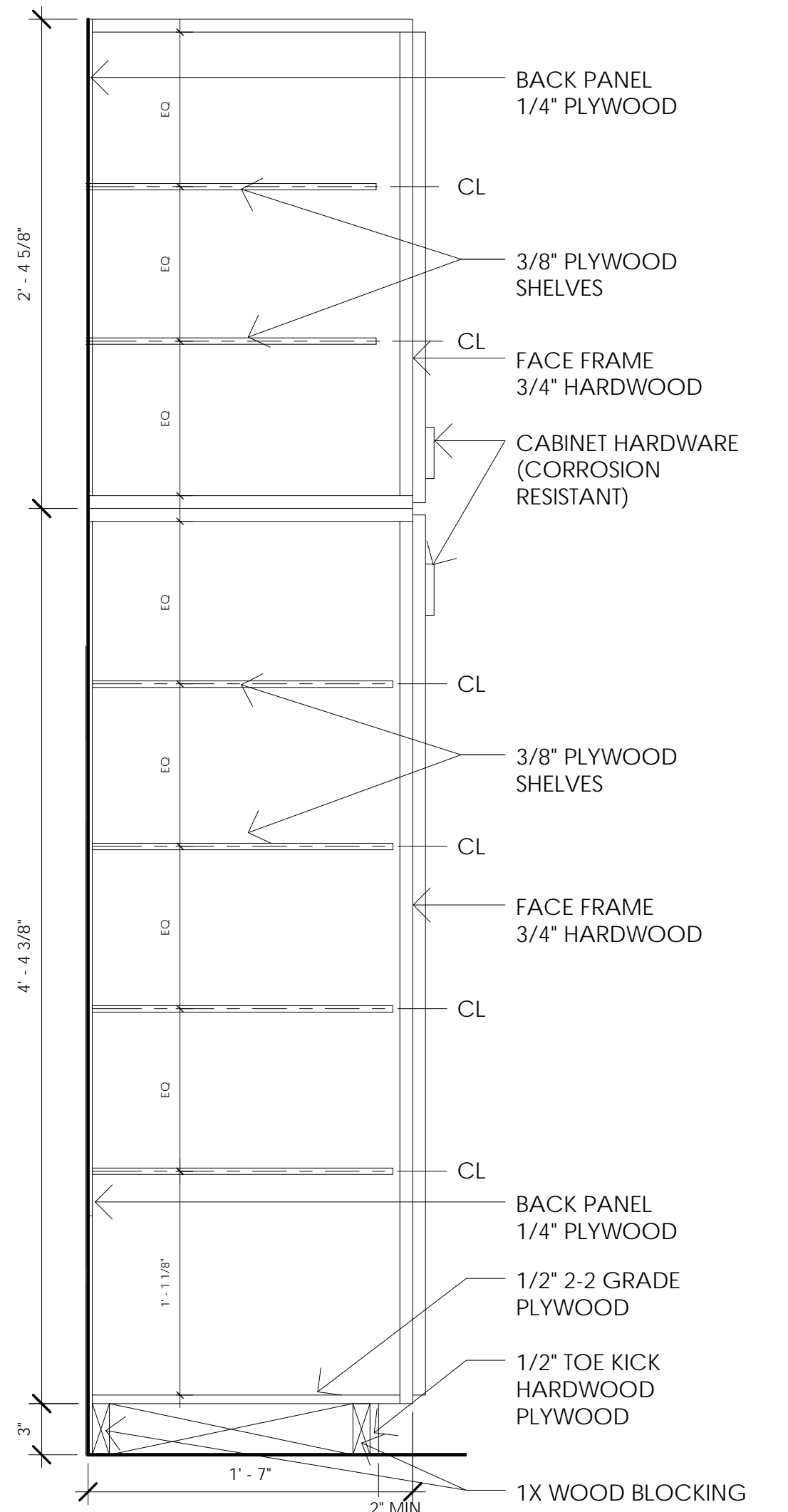
CORNER OR LINEAR BRACING MUST BE PROVIDED AT POINTS WHERE NECESSARY TO ENSURE RIGIDITY AND PROPER JOINING OF VARIOUS COMPONENTS.

ALL WOOD PARTS MUST BE DRIED TO A MOISTURE CONTENT OF 7% OR LESS AT THE TIME OF FABRICATION.

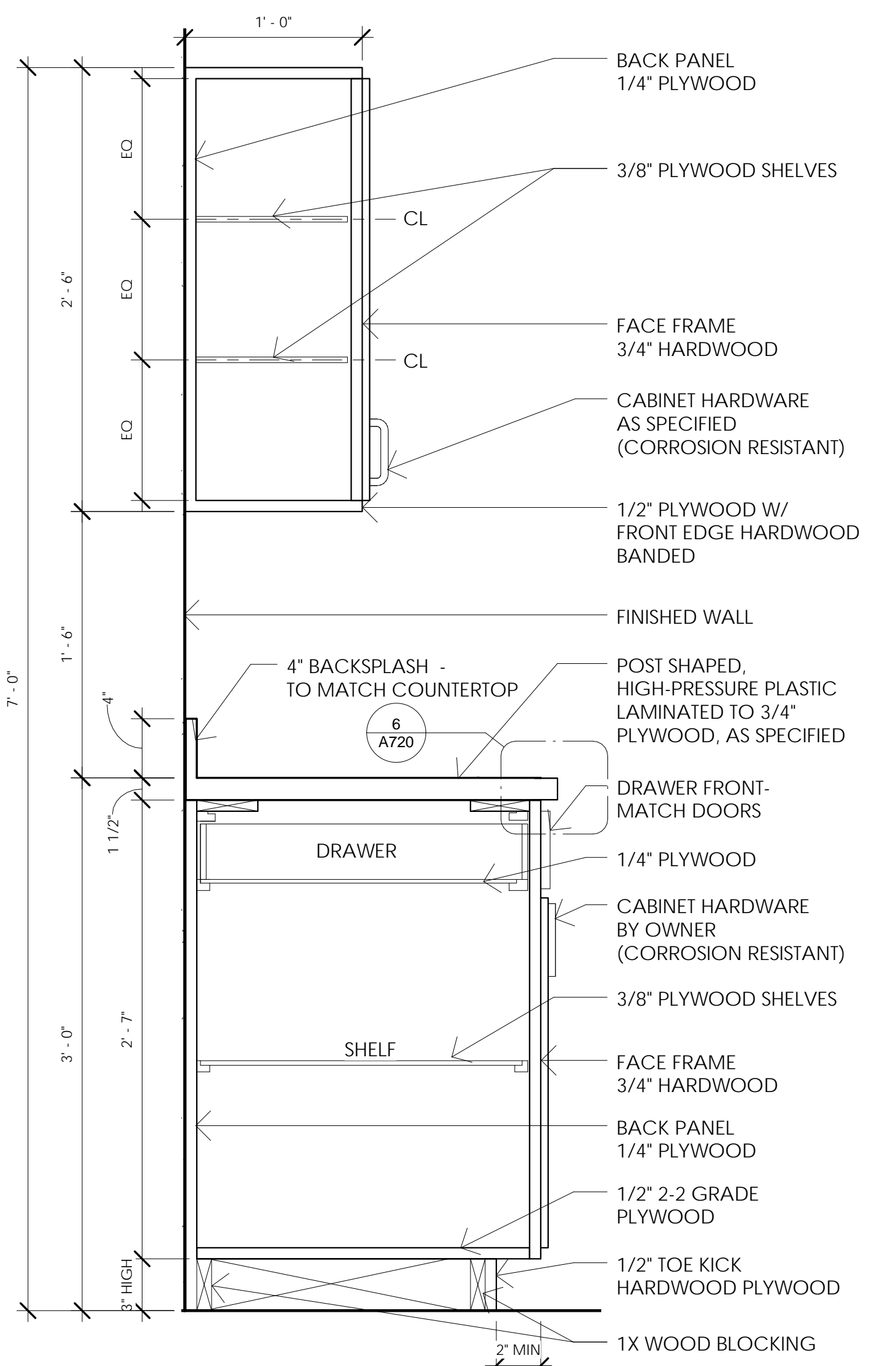
ALL INTERIOR EXPOSED SURFACES SHALL BE FREE OF SAW MARKS AND POOR WORKMANSHIP, AND SHALL BE COVERED WITH A LAMINATE MATERIAL OR HAVE A MIN OF 1 COAT OF CLEAR OR PIGMENTED FINISH.



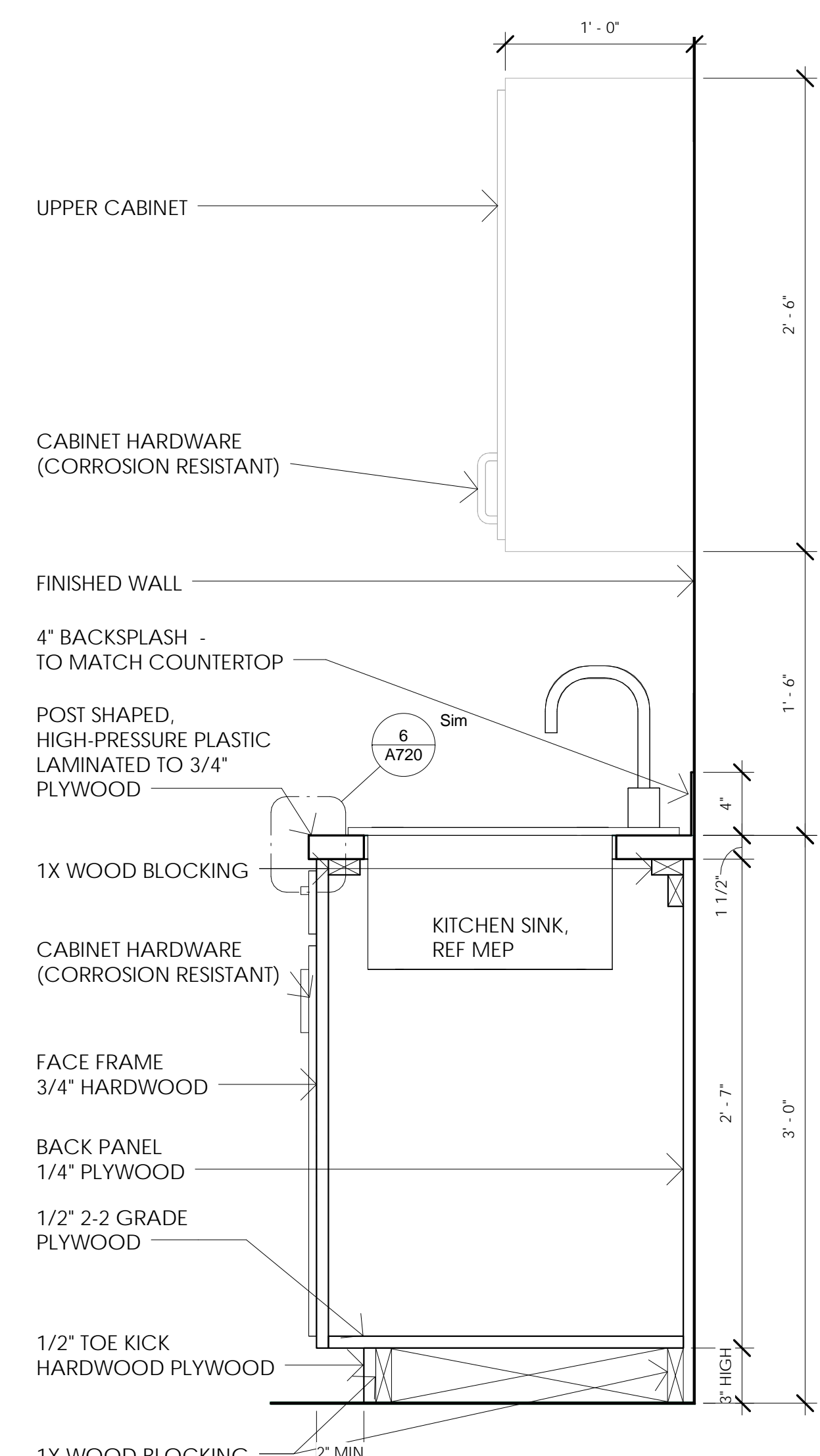
4 Section thru Vent Hood
1 1/2" = 1'-0"



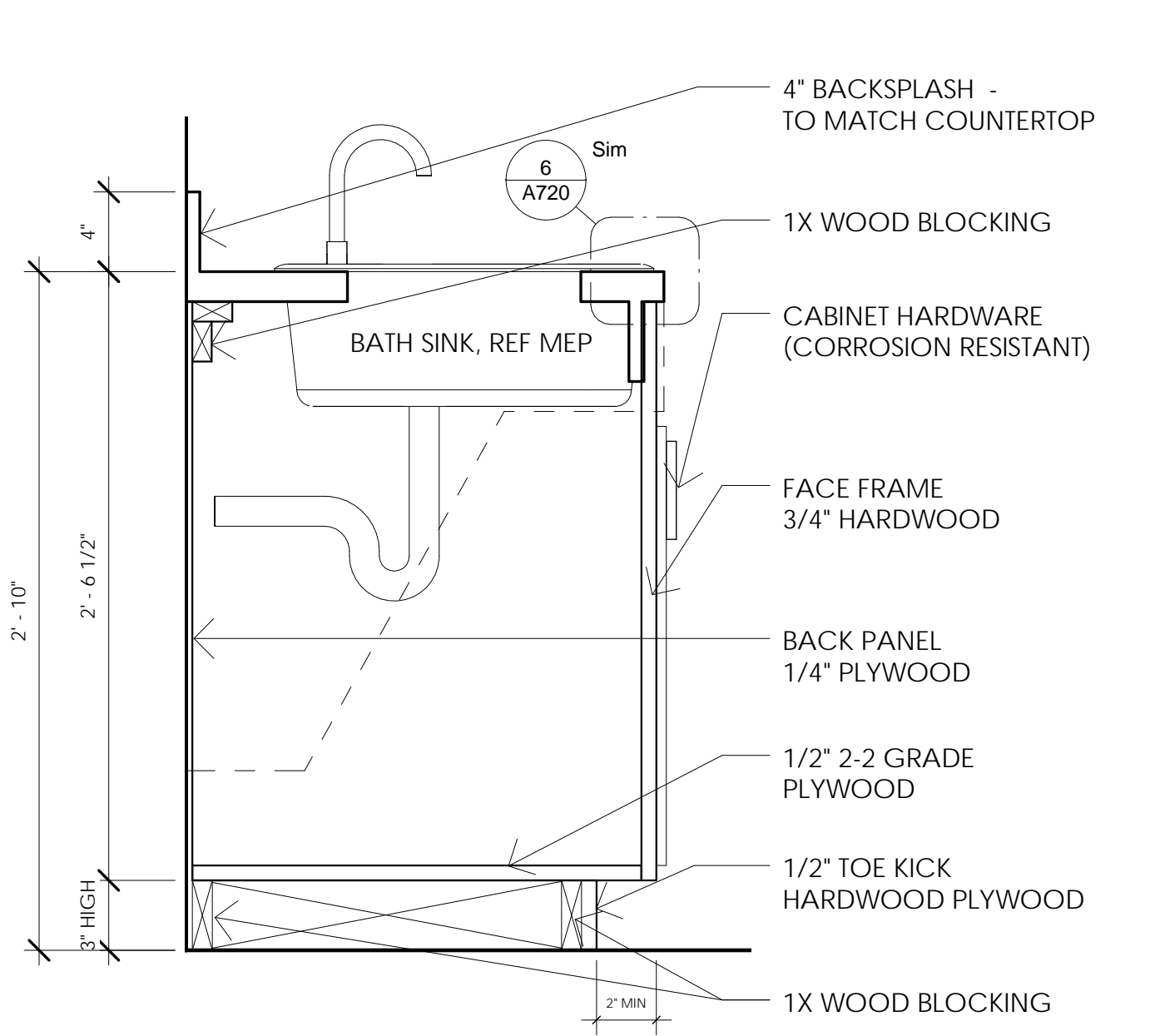
3 Section thru Storage
1 1/2" = 1'-0"



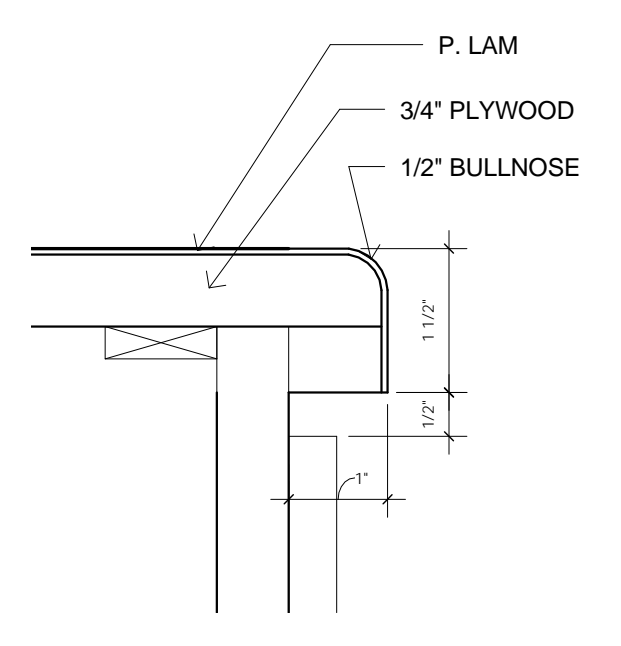
2 Section thru Lower and Upper Casework
1 1/2" = 1'-0"



1 Section thru Sink
1 1/2" = 1'-0"



5 Section thru Vanity
1 1/2" = 1'-0"



6 Counter Top Edge Profile
6" = 1'-0"

EXPOSED CABINET HARDWARE MUST COMPLY WITH BUILDERS HARDWARE MANUFACTURING ASSOCIATION FINISHING STANDARDS.

ALL EXTERIOR EXPOSED SURFACES & EDGES EXCEPT THE EDGES OF END PANELS & THE EDGES OF BACK PANELS, SHALL BE FREE OF SAW MARKS & OTHER IMPERFECTIONS & SHALL BE FILLED & SANDED, EDGE-BANDED, OR OTHERWISE FINISHED TO ENSURE COMPLIANCE WITH THE PERFORMANCE STANDARDS.

ALL EXTERIOR EXPOSED PARTS OF CABINETS MUST HAVE NAILS & STAPLES SET & HOLES FILLED.

ALL EXPOSED CONSTRUCTION JOINTS MUST BE FITTED IN A WORKMAN-LIKE MANNER CONSISTENT WITH SPECIFICATIONS.

FOR A LISTING OF CERTIFIED CABINET MANUFACTURERS COMPLYING WITH ANSI/KCMA A161.1, PLEASE REFER TO THE 2008 KCMA DIRECTORY OF CERTIFIED CABINET MANUFACTURERS AT WWW.KCMA.ORG.

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MILLWORK & DETAILS

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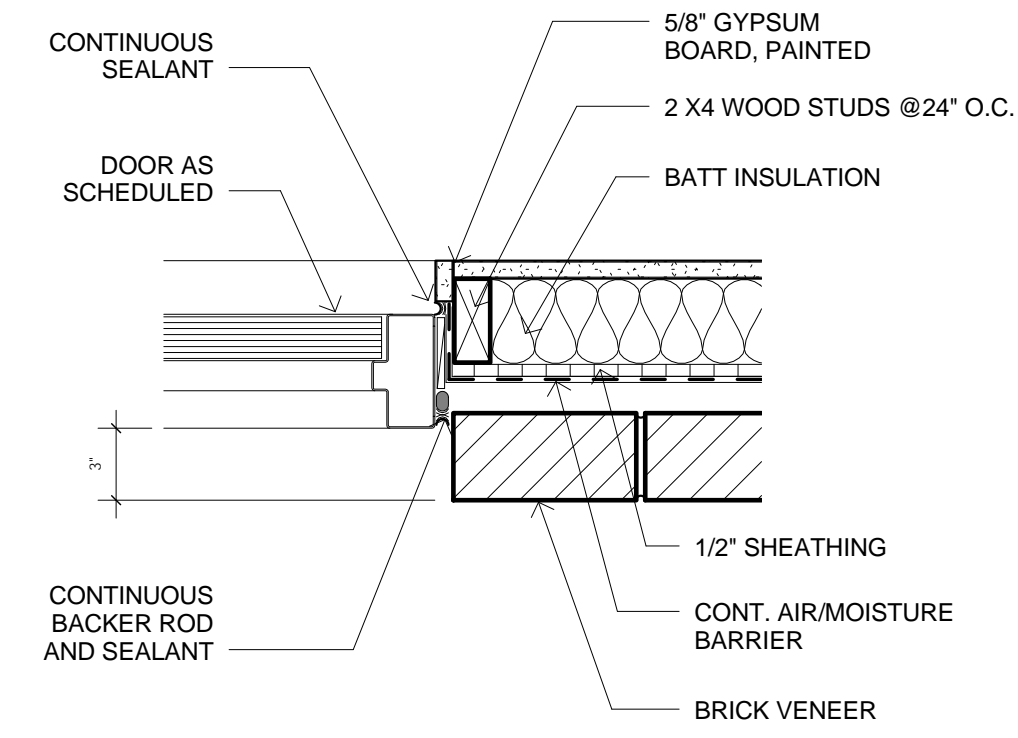
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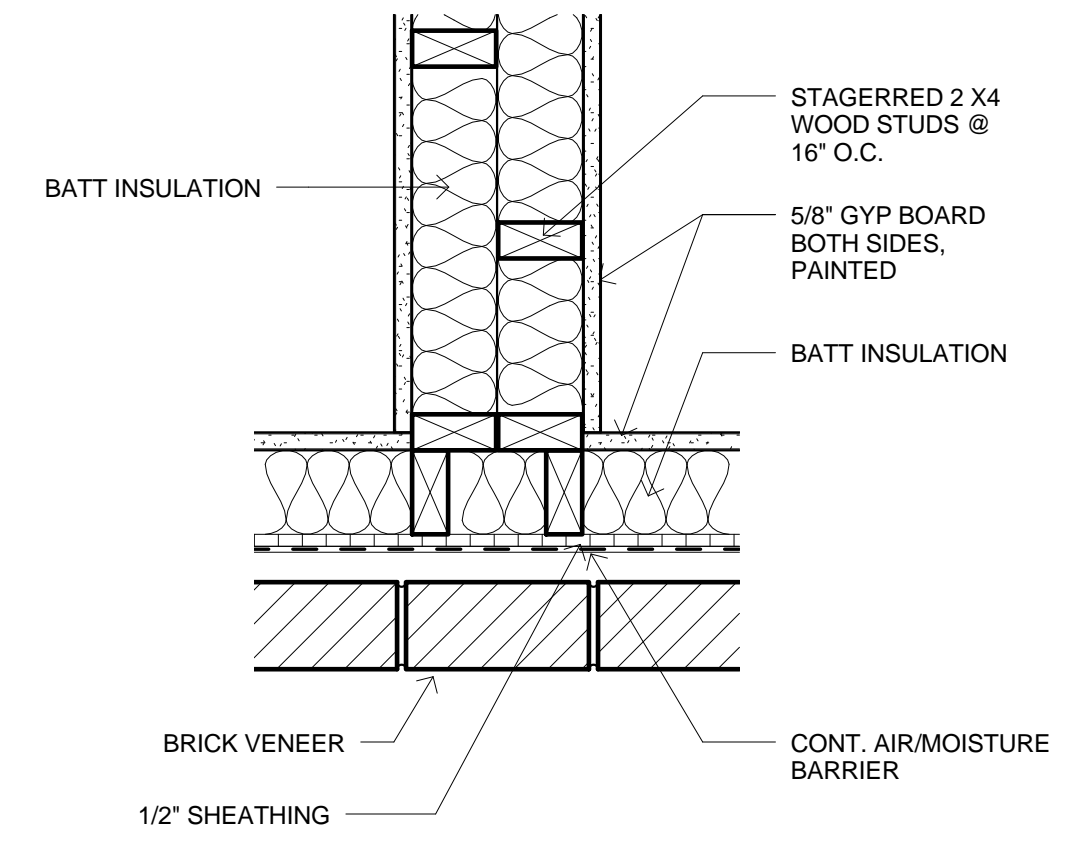
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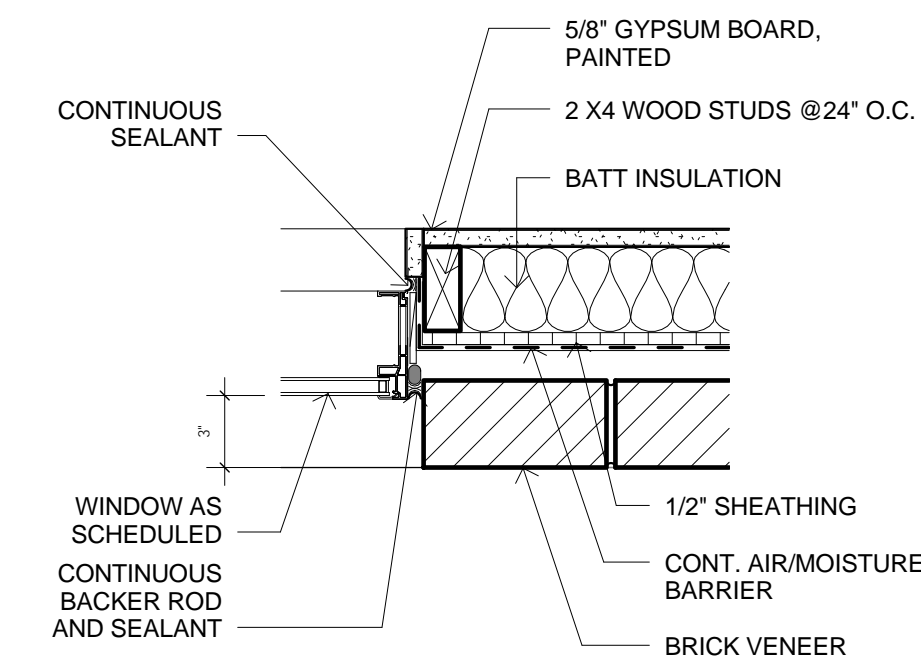
NO	ISSUE	DATE



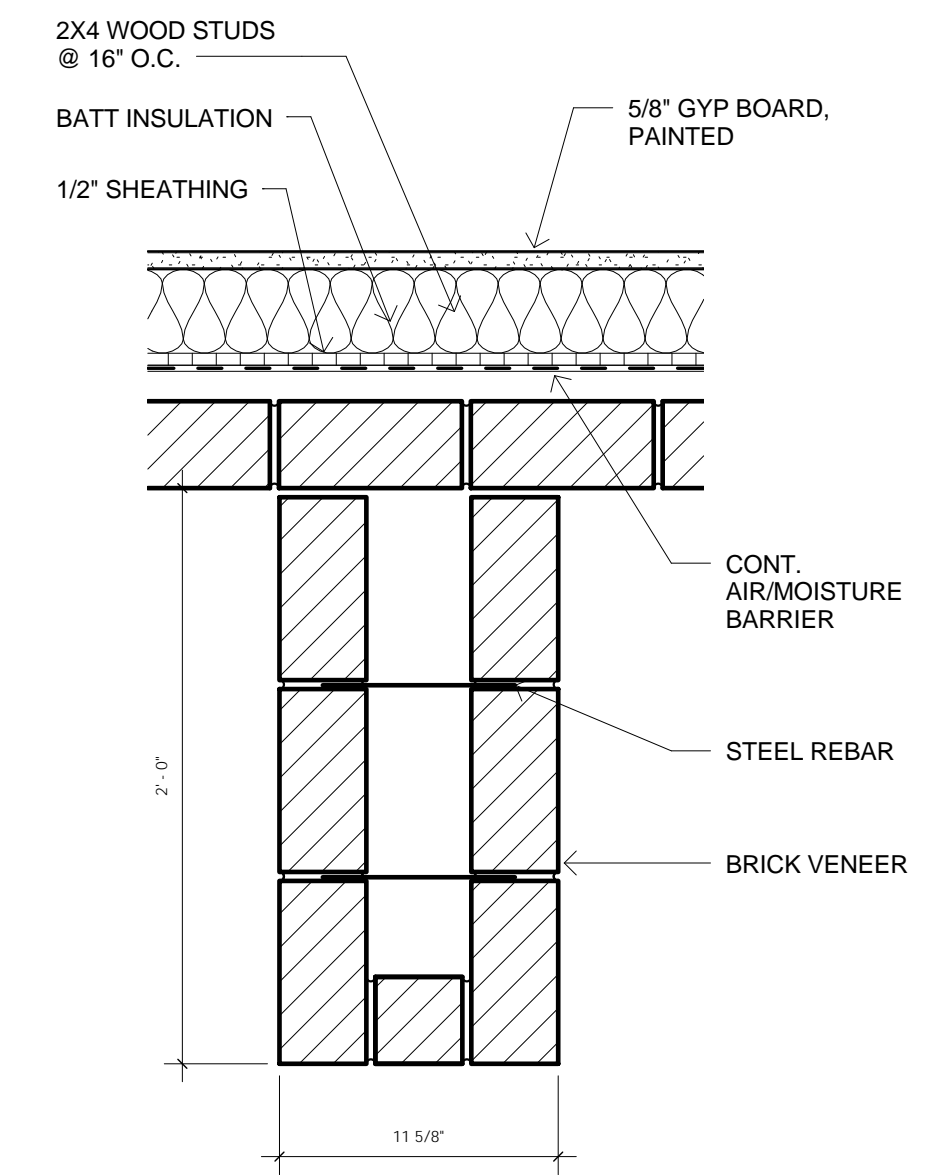
4 Plan Detail #4 - Door
1 1/2" = 1'-0"



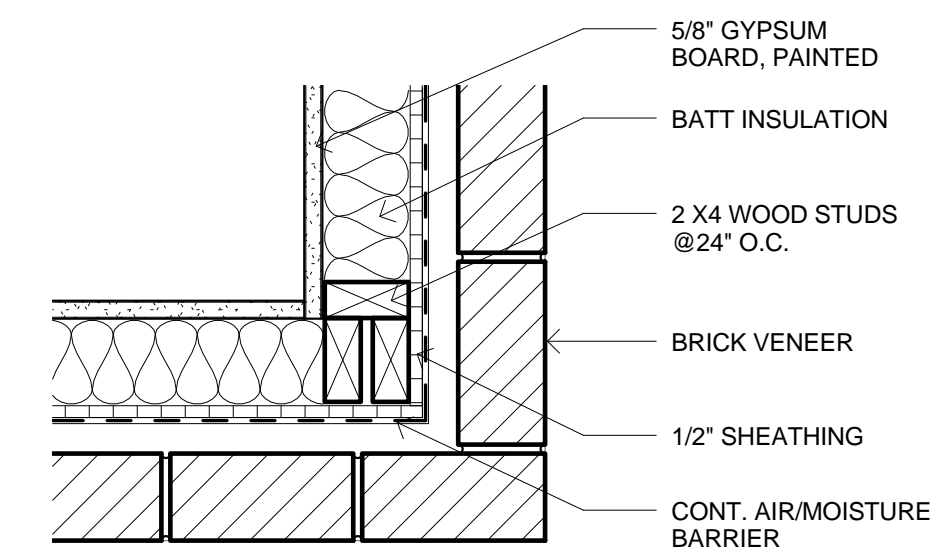
1 Plan Detail #1 - Demising Wall
1 1/2" = 1'-0"



5 Plan Detail #5 - Window
1 1/2" = 1'-0"

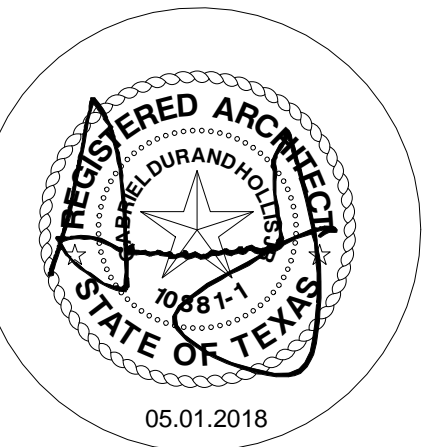


2 Plan Detail #2 - Furr Out
1 1/2" = 1'-0"



3 Plan Detail #3 - Corner
1 1/2" = 1'-0"

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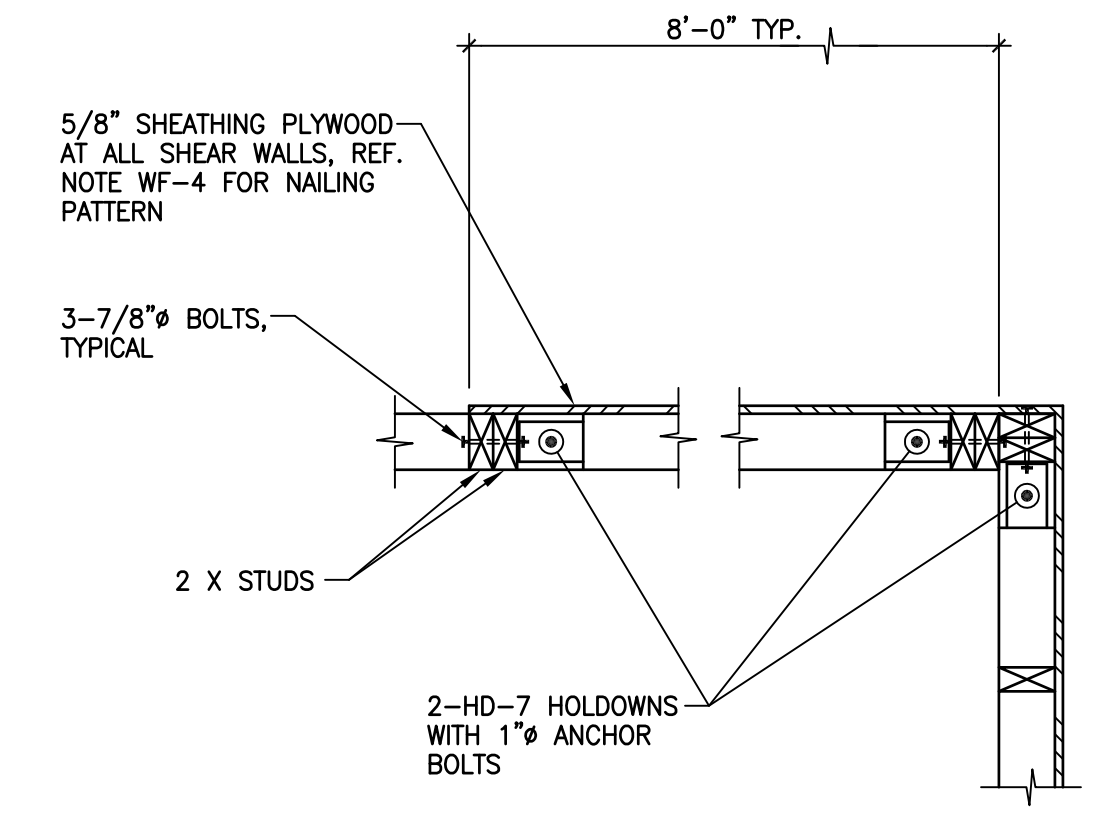
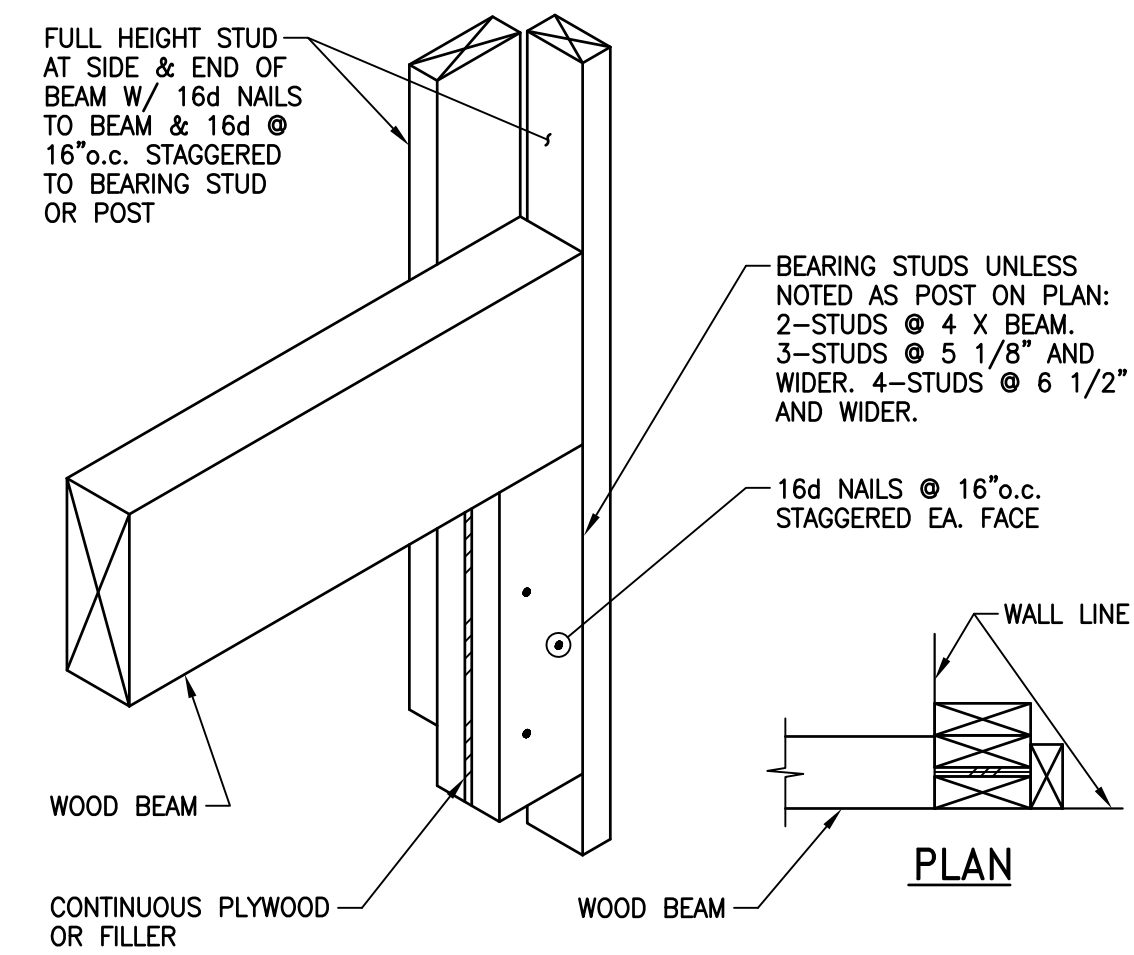
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PLAN DETAILS

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TEXAS LICENSE NO. 10881

SHEET NO.:



NAILING SCHEDULE

CONNECTION	NAILING
JOIST OR TRUSS BEARING ON SILL OR GIRDER, TOENAIL	(3) 8d
BRIDGING TO JOIST, TOENAIL EACH END	(2) 8d
SOLE PLATE TO JOIST OR BLOCKING, FACE NAIL	16d AT 16" o.c.
TOP PLATE TO STUD, END NAIL TO EACH STUD	(2) 16d
STUD TO SOLE PLATE	(4) 8d TOENAIL OR (2) 16d END NAIL
DOUBLE STUDS, FACE NAIL	16d AT 24" o.c.
DOUBLE TOP PLATES, FACE NAIL	16d AT 16" o.c.
TOP PLATES, LAPS AND INTERSECTIONS, FACE NAIL	2 - 16d
CONTINUOUS HEADER, TWO PIECES	16d AT 16" o.c. ALONG EACH EDGE
CEILING JOISTS TO PLATE, TOENAIL	(3) 8d
CONTINUOUS HEADER TO STUD, TOENAIL	(4) 8d
CEILING JOISTS, LAPS OVER PARTITIONS, FACE NAIL	(3) 16d
CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL	(3) 16d
RAFTER OR TRUSS TO PLATE, TOE NAIL	(3) 8d
BUILT-UP CORNER STUDS	16d AT 24" o.c.

NOTES:
 1. MINIMUM NAILING SPECIFIED HEREIN SHALL BE PROVIDED UNLESS OTHERWISE NOTED ON DETAILS OR STRUCTURAL NOTES.
 2. COMMON OR BOX NAILS MAY BE USED. 16d NAILS MAY BE EITHER COMMON OR SINKER.

WOOD FRAMING NOTES:

WF-1 ALL FRAMING SHALL CONSIST OF #2 SOUTHERN YELLOW PINE OR BETTER, HAVING AN ALLOWABLE BENDING STRESS (F_b) OF 1,250 PSI, A MODULUS OF ELASTICITY OF 1,600,000 PSI, AND AN ALLOWABLE SHEAR STRESS OF 90 PSI, UNLESS INDICATED OTHERWISE.

WF-2 ALL LUMBER SHALL BE GRADE STAMPED.

SILLS ON CONCRETE PRESSURE TREATED

UTILITY GRADE
 STUDS STUD GRADE
 PLATES, CAPS UTILITY GRADE

WF-3 PRE-ENGINEERED WOOD JOISTS SHALL BE DESIGNED FOR THE FOLLOWING LOADS:
 WIND20.3 PSF
 FLOOR LIVE LOADS40 PSF
 ROOF LIVE LOADS20 PSF
 ROOF DEAD LOADS15 PSF

WF-4 WOOD JOIST MANUFACTURER SHALL PROVIDE ALL BRACING NECESSARY TO PROVIDE LATERAL STABILITY AND MAINTAIN SLENDERNESS RATIOS WITHIN HIS DESIGN.

WF-5 ROOF SHEATHING SHALL BE 5/8" PLYWOOD OR OSB OVER WOOD JOISTS. PROVIDE ADEQUATE BLOCKING, TONGUE AND GROOVE EDGES OR PLYCLIPS (2 FOR 48" SPAN). USE 6d NAILS AT 6" o.c. AT END JOINTS.

WF-6 PLYWOOD FLOOR OR OSB SHEATHING SHALL BE 3/4" TONGUE AND GROOVE STRUCTURAL GRADE 1 CD (48/24).

WF-7 PLACE PLYWOOD PANELS WITH LONG DIMENSION RUNNING PERPENDICULAR TO JOISTS WITH END JOINTS STAGGERED 1/2 PANEL. USE 6d NAILS SPACED AT 6" o.c. AT END JOINTS OF PANELS AND AT WALL CONNECTIONS. FIELD NAILING OF INTERMEDIATE SUPPORTS SHALL BE AT 10" o.c. FOR FLOOR AND AT 12" o.c. FOR ROOF.

WF-8 TRUSS SUPPLIER SHALL SUBMIT FABRICATION AND ERECTION DRAWINGS FOR APPROVAL PRIOR TO FABRICATION. DRAWINGS SHALL BEAR THE SEAL OF A REGISTERED ENGINEER IN THE STATE OF TEXAS AND SHALL CLEARLY INDICATE DESIGN LOADS, MEMBER STRESSES, LUMBER GRADES, SPLICE LOCATIONS, REQUIRED BLOCKING, BRIDGING, BRACING, PLACEMENT, DESIGNATION, BUILDING NUMBER, AND NAME OF PROJECT.

WF-9 PROVIDE A SINGLE PLATE AT THE BOTTOM AND A DOUBLE PLATE AT THE TOP OF ALL STUD WALLS. SILL PLATES SHALL BE BOLTED TO FOUNDATION WITH (GALV.) 1/2" TITEN SCREW ANCHORS SPACED AT 6'-0" o.c. MAXIMUM. MINIMUM EMBEDMENT = 6".

WF-10 STUDS SHALL BE DOUBLED AT ALL ANGLES, CORNERS, BEAM SUPPORTS, AND AROUND ALL OPENINGS.

WF-11 ALL OUTSIDE CORNERS SHALL BE BRACED WITH A DIAGONAL 1x4 LET INTO OUTSIDE EDGE OF STUDDING.

WF-12 PROVIDE SOLID BLOCKING IN ALL SPANS OVER 8'-0". MAXIMUM DISTANCE BETWEEN BLOCKING AND BEARING SHALL BE 8'-0". PROVIDE SOLID BLOCKING AT ALL SUPPORTS.

WF-13 PROVIDE SOLID BLOCKING BETWEEN FLOOR TRUSSES AT INTERIOR LOAD BEARING WALL LOCATIONS.

WF-14 UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL CANTILEVERED JOISTS SHALL EXTEND INTO THE BUILDING A DISTANCE EQUAL TO THE CANTILEVER. CANTILEVERED JOISTS RUNNING PERPENDICULAR TO FRAMING INSIDE THE BUILDING SHALL BE CONNECTED TO INSIDE MEMBER WITH STANDARD JOIST HANGERS. CANTILEVERED JOISTS RUNNING PARALLEL TO FRAMING INSIDE THE BUILDING SHALL BE NAILED TO THE SIDE OF THE INSIDE MEMBERS WITH 10d NAILS AT 12" o.c. TOP AND BOTTOM.

WF-15 UNLESS OTHERWISE INDICATED, USE TYPE LU JOIST HANGERS AS MANUFACTURED BY THE SIMPSON COMPANY FOR FLUSH TYPE JOIST CONNECTIONS TO SUPPORTING BEAMS. COLUMN CAP AND BASE CONNECTIONS SHALL BE AS MANUFACTURED BY THE SIMPSON COMPANY, TYPE AS RECOMMENDED BY THE MANUFACTURER FOR THE SIZE OF JOIST OR COLUMN AND BEAMS BEING CONNECTED.

LUUNDY & FRANKE
 ENGINEERING
 549 HEIMER ROAD
 SAN ANTONIO, TEXAS 78232
 PH. (210) 979-7900 FX. (210) 979-7800

DATE: 02/22/18

GENERAL NOTES:

GN-1 THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (2015) AS AMENDED AND ADOPTED BY THE GOVERNING AUTHORITY, AND APPLICABLE INDUSTRY STANDARDS (AISC, ACI, ETC.).

GN-2 THE DESIGN LOADS ARE:

SUPERIMPOSED DEAD LOADS
 MECHANICAL DUCTS/CONDUITS, CEILING, ETC. 5 PSF
 MECHANICAL EQUIPMENT AS INDICATED ON PLANS

FLOOR LIVE LOAD
 CORRIDOR100 PSF
 OFFICES 50 PSF
 MOVEABLE PARTITIONS 20 PSF
 MECHANICAL ROOMS 150 PSF
 (NON REDUCIBLE)

ASSEMBLY AREAS:
 FIXED SEATS 60 PSF
 LOBBIES 100 PSF
 MOVEABLE SEATS 100 PSF
 STAGES & PLATFORMS 125 PSF
 CATWALKS 40 PSF

ROOF LIVE LOAD
 FLAT ROOF 20 PSF
 PITCHED ROOF 20 PSF

ROOF SNOW LOAD
 GROUND SNOW P_g 5 PSF
 SNOW EXPOSURE FACTOR C_e 1.0
 SNOW LOAD IMPORTANCE FACTOR I_s 1.1
 THERMAL FACTOR C_t 1.0

WIND LOAD
 BASIC WIND SPEED (ULTIMATE DESIGN) 115
 WIND LOAD IMPORTANCE FACTOR I_w 1.15
 BUILDING CATEGORY III
 WIND EXPOSURE C
 INTERNAL PRESSURE COEF. ±0.18
 COMPONENTS AND CLADDING WIND PRESSURE 25 PSF

EARTHQUAKE LOADS
 SEISMIC IMPORTANCE FACTOR I_e 1.00
 SPECTRAL RESPONSE ACCELERATION S_s 14%
 SPECTRAL RESPONSE ACCELERATION S_1 3%
 SPECTRAL RESPONSE COEF. S_DS 14%
 SPECTRAL RESPONSE COEF. S_1 5%
 SEISMIC DESIGN CATEGORY A
 SEISMIC RESPONSE COEF. C_s 0.1

RETAINING WALLS
 GLOBAL STABILITY ANALYSIS FACTOR OF SAFETY 1.5
 TYPE CANTILEVER
 EQUIVALENT FLUID PRESSURE 50 PCF
 BACKFILL DRAINED/ONSITE
 FOOTING BEARING 1500 PSF
 SURCHARGE 200 PSF

FLOOD LOAD
 ELEVATION OF LOWEST FLOOR REF. ARCH. DWGS.

GN-3 ALLOWABLE STRESS DESIGN LOAD COMBINATIONS (FOR ALL DESIGNS EXCEPT CONCRETE)

D
 D+L
 D+L+(L_r OR S OR R)
 D+(W OR 0.7E)+(L_r OR S OR R)
 0.6D+W
 0.6D+0.7E

STRENGTH DESIGN LOAD COMBINATIONS (FOR CONCRETE DESIGN)

1.4D
 1.2D+1.6L+0.5(L_r OR S OR R)
 1.2D+1.6(L_r OR S OR R)+(L OR 0.8W)
 1.2D+1.6W+L+0.5(L_r OR S OR R)
 1.2D+1.0E+L+S
 0.9D+(1.0E OR 1.6W)

GN-4 PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR AND FABRICATOR SHALL VERIFY ALL QUANTITIES, DIMENSIONS AND CONDITIONS AND NOTIFY ARCHITECT/STRUCTURAL ENGINEER OF RECORD OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

GN-5 UTILITIES PENETRATING BUILDING SHALL BE FLEXIBLE, USING SLEEVE JOINTS, BENDS, LOOPS, ETC. TO PERMIT MOVEMENTS DUE TO EXPANSIVE UNDERLYING SOILS.

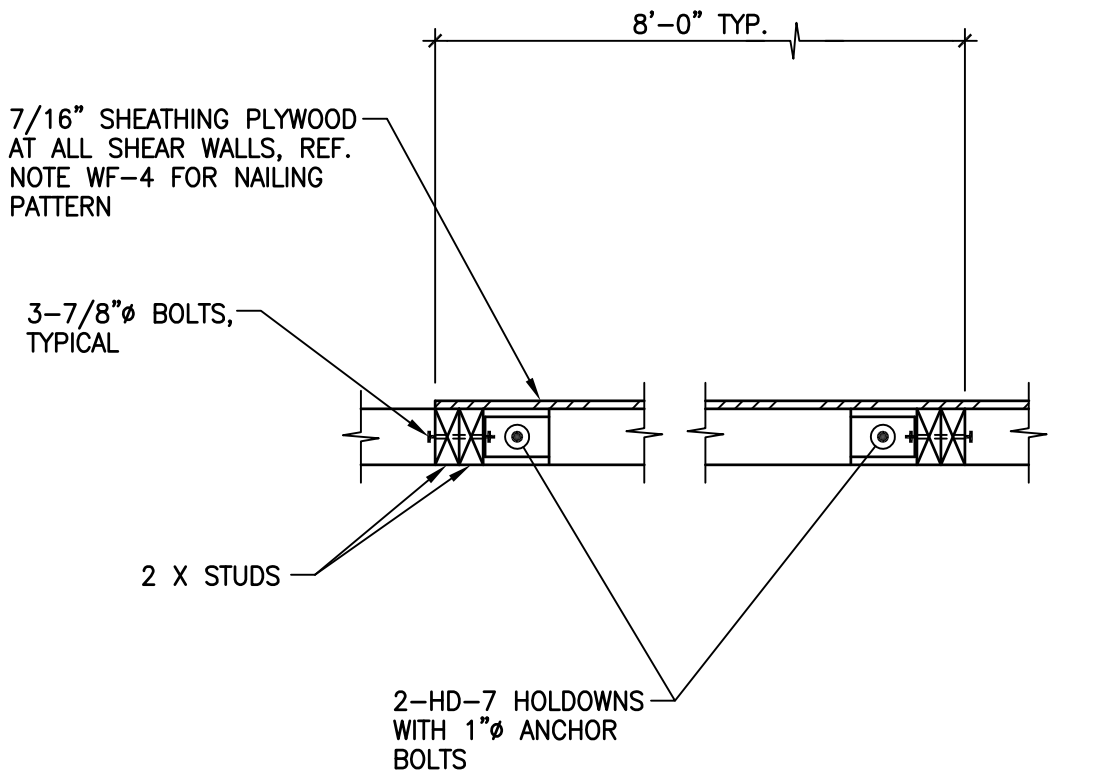
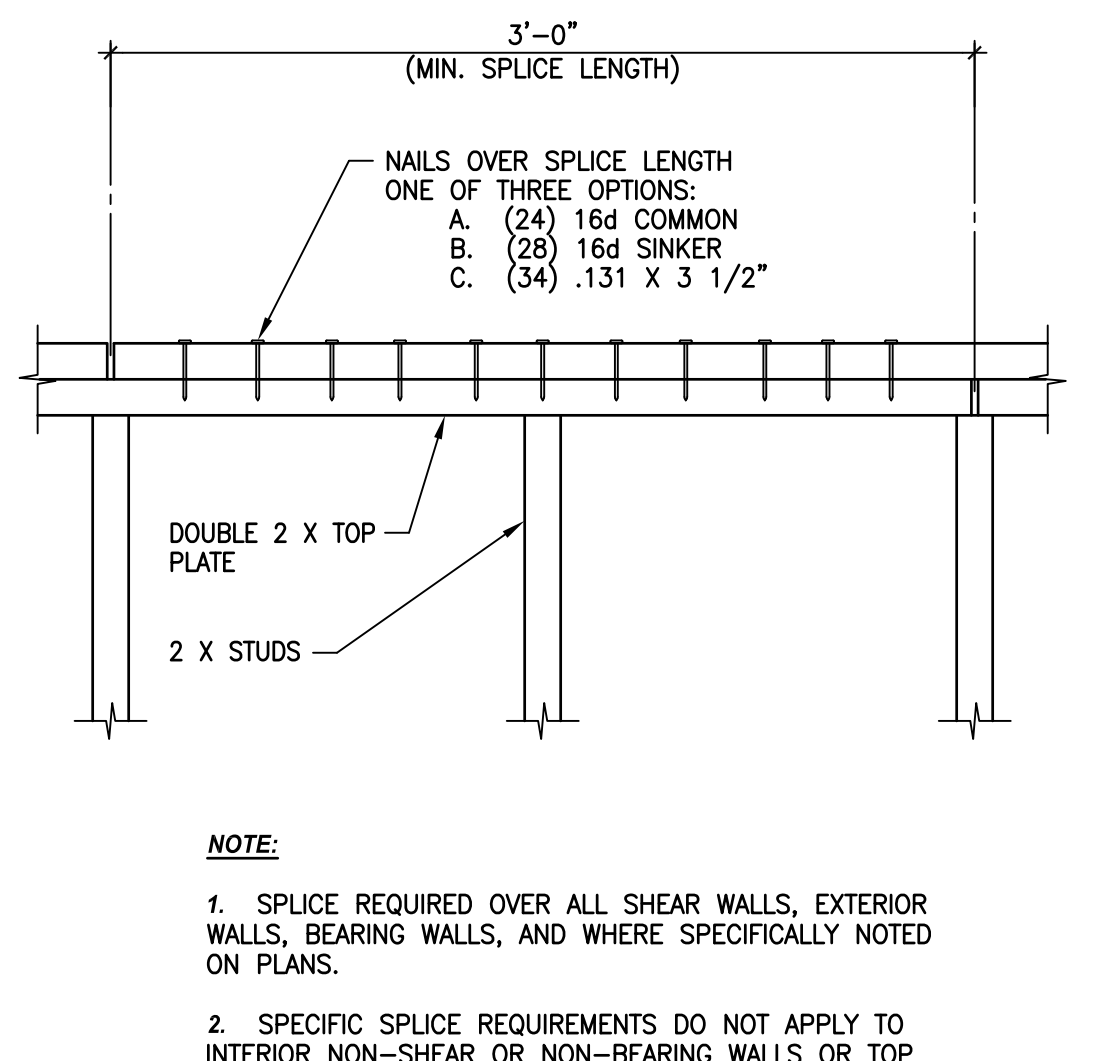
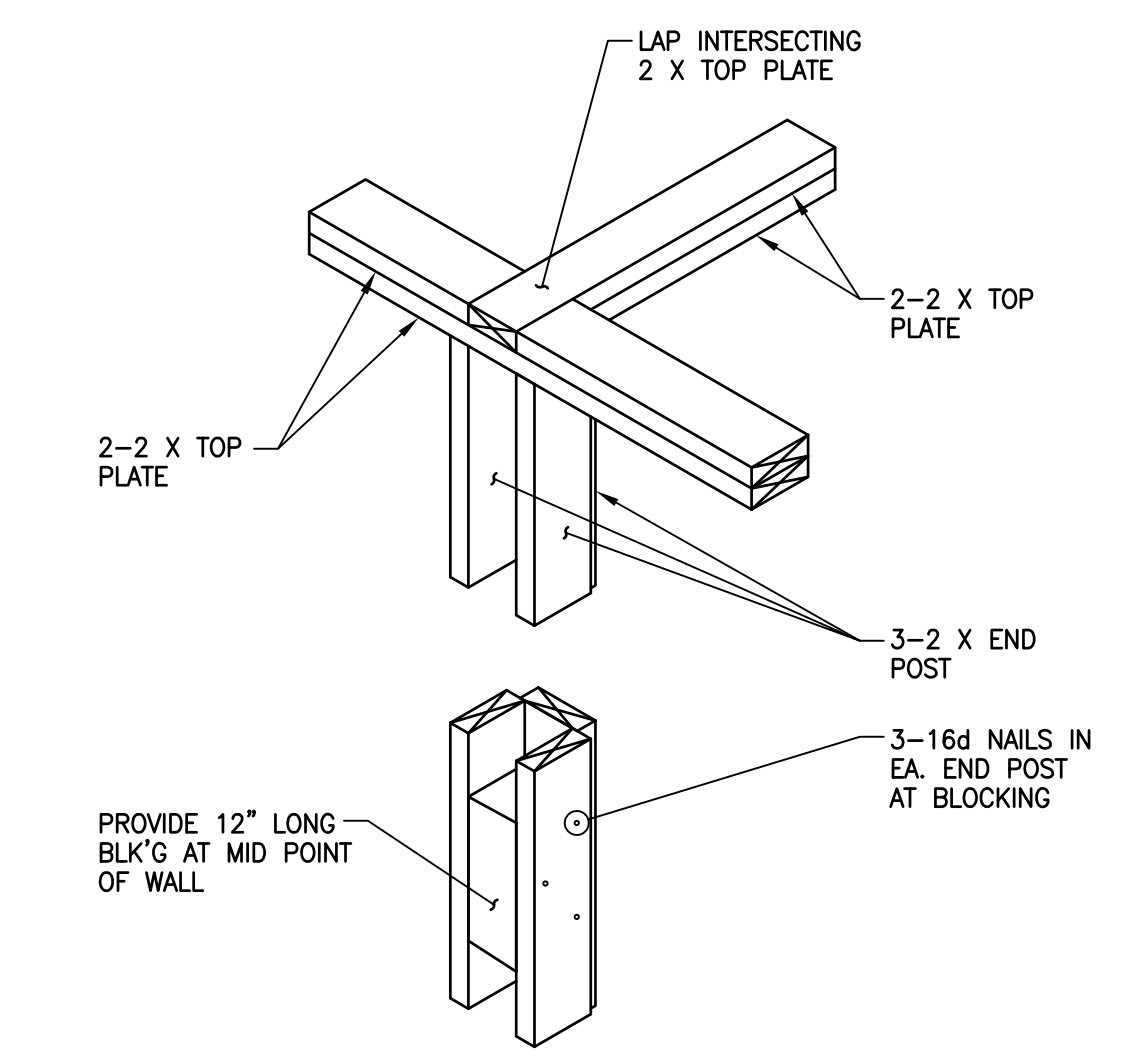
GN-6 PROVIDE ADEQUATE AND APPROPRIATE STRUCTURAL STEEL FRAMING FOR THE SUPPORT AND MOUNTING OF MECHANICAL EQUIPMENT RESTING ON, OR SUSPENDED FROM, STEEL SUPERSTRUCTURE.

GN-7 THE STRUCTURAL DRAWINGS FOR THIS PROJECT ARE COPYRIGHTED AND SHALL NOT BE REPRODUCED FOR USE AS FABRICATOR'S ERECTION DRAWINGS. THE CONTRACTOR SHALL ALLOW ADEQUATE TIME AND EXPENSE FOR SUBCONTRACTORS TO PRODUCE THEIR OWN ORIGINAL ERECTION AND PLACEMENT DRAWINGS.

GN-8 THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. ANY PROPOSED APPLICATION OF CONSTRUCTION LOADS OR OF ANY LOADS TO THE PARTIALLY COMPLETED STRUCTURE WHICH EXCEED THE DESIGN LOADS WILL REQUIRE REANALYSIS AND PROBABLE REDESIGN.

GN-9 PROVIDE 5.0 TONS OF EXTRA REINFORCING STEEL, DETAILING, LABOR FOR PLACING AND FABRICATION AS DIRECTED IN THE FIELD AND SHOP.

GN-10 PROVIDE 10.0 TONS OF EXTRA STRUCTURAL STEEL, DETAILING, LABOR FOR ERECTION AND FABRICATION AS DIRECTED IN THE FIELD AND SHOP.



WF-9 PROVIDE A SINGLE PLATE AT THE BOTTOM AND A DOUBLE PLATE AT THE TOP OF ALL STUD WALLS. SILL PLATES SHALL BE BOLTED TO FOUNDATION WITH (GALV.) 1/2" TITEN SCREW ANCHORS SPACED AT 6'-0" o.c. MAXIMUM. MINIMUM EMBEDMENT = 6".

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WF-13 PROVIDE SOLID BLOCKING BETWEEN FLOOR TRUSSES AT INTERIOR LOAD BEARING WALL LOCATIONS.

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WF-15 UNLESS OTHERWISE INDICATED, USE TYPE LU JOIST HANGERS AS MANUFACTURED BY THE SIMPSON COMPANY FOR FLUSH TYPE JOIST CONNECTIONS TO SUPPORTING BEAMS. COLUMN CAP AND BASE CONNECTIONS SHALL BE AS MANUFACTURED BY THE SIMPSON COMPANY, TYPE AS RECOMMENDED BY THE MANUFACTURER FOR THE SIZE OF JOIST OR COLUMN AND BEAMS BEING CONNECTED.

WF-16 HEADER SCHEDULE:

MAXIMUM SPAN	NON LOAD BEARING	LOAD BEARING
0' TO 2'	2-2x6	2-2x6
2' TO 3'	2-2x6	2-2x8
3' TO 4'	2-2x6	2-2x10
4' TO 6'	2-2x8	2-2x10
6' TO 8'	2-2x8	2-2x12

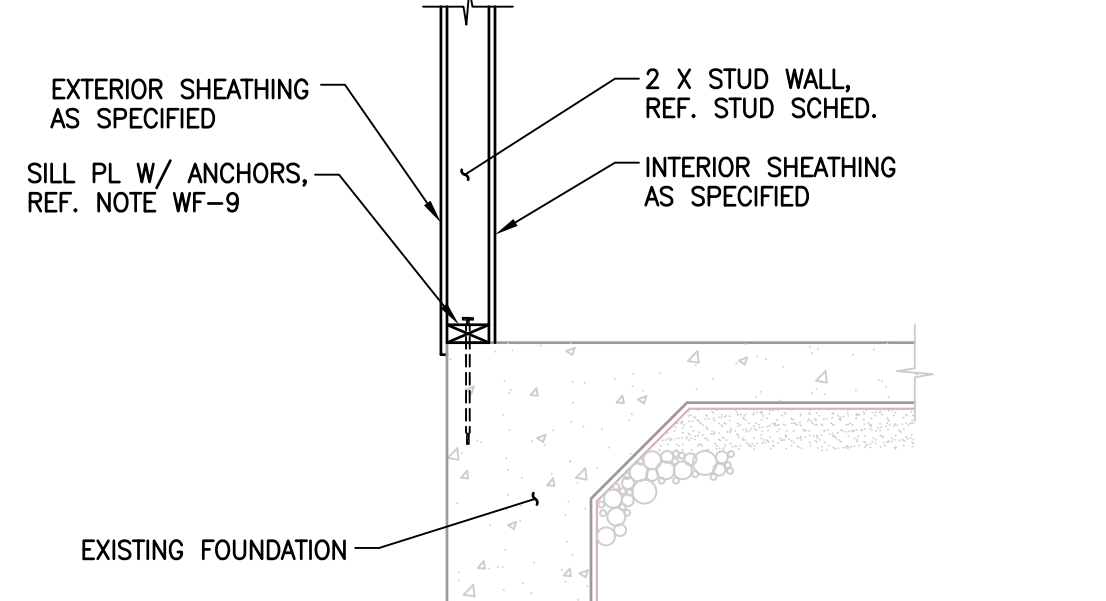
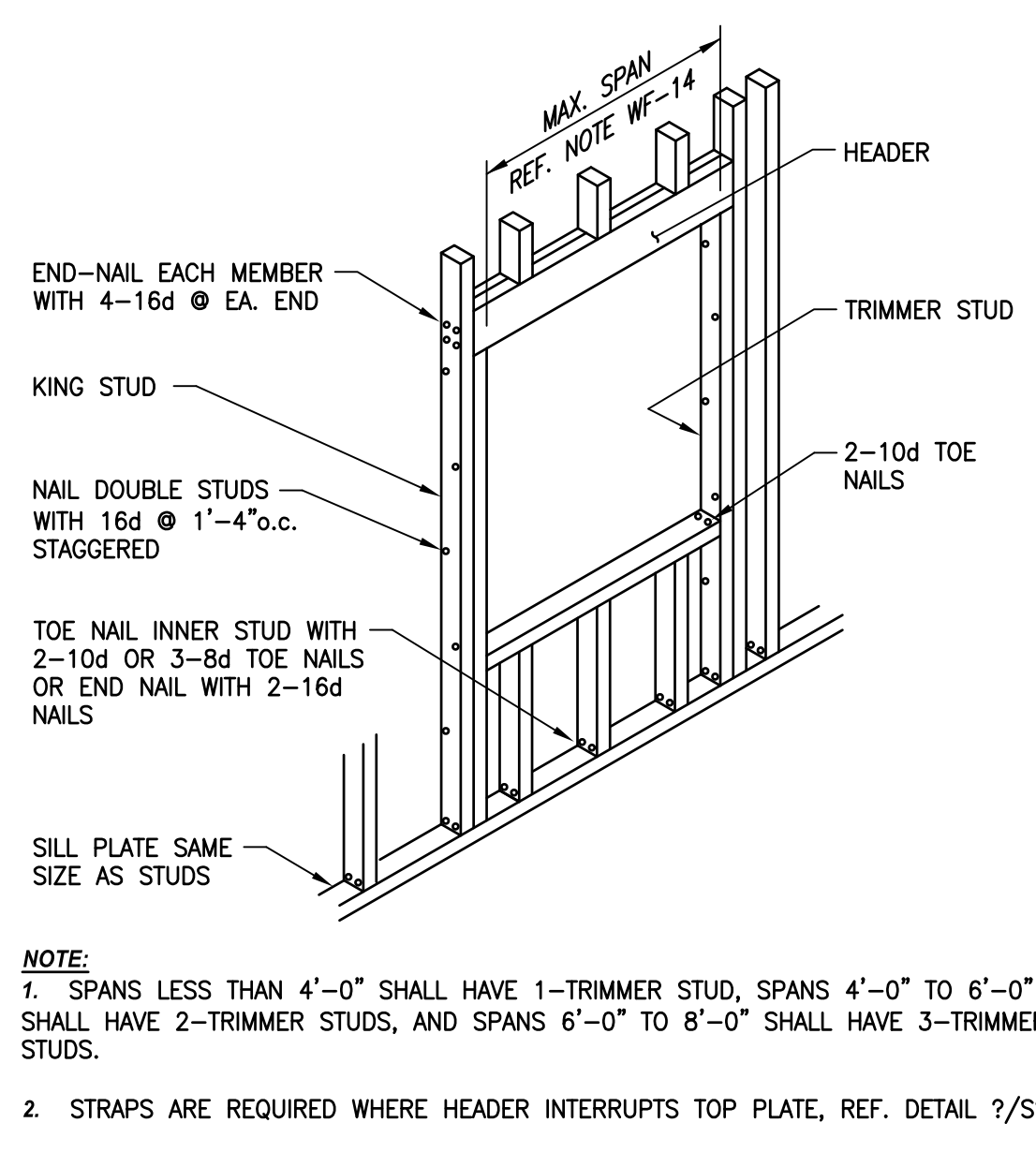
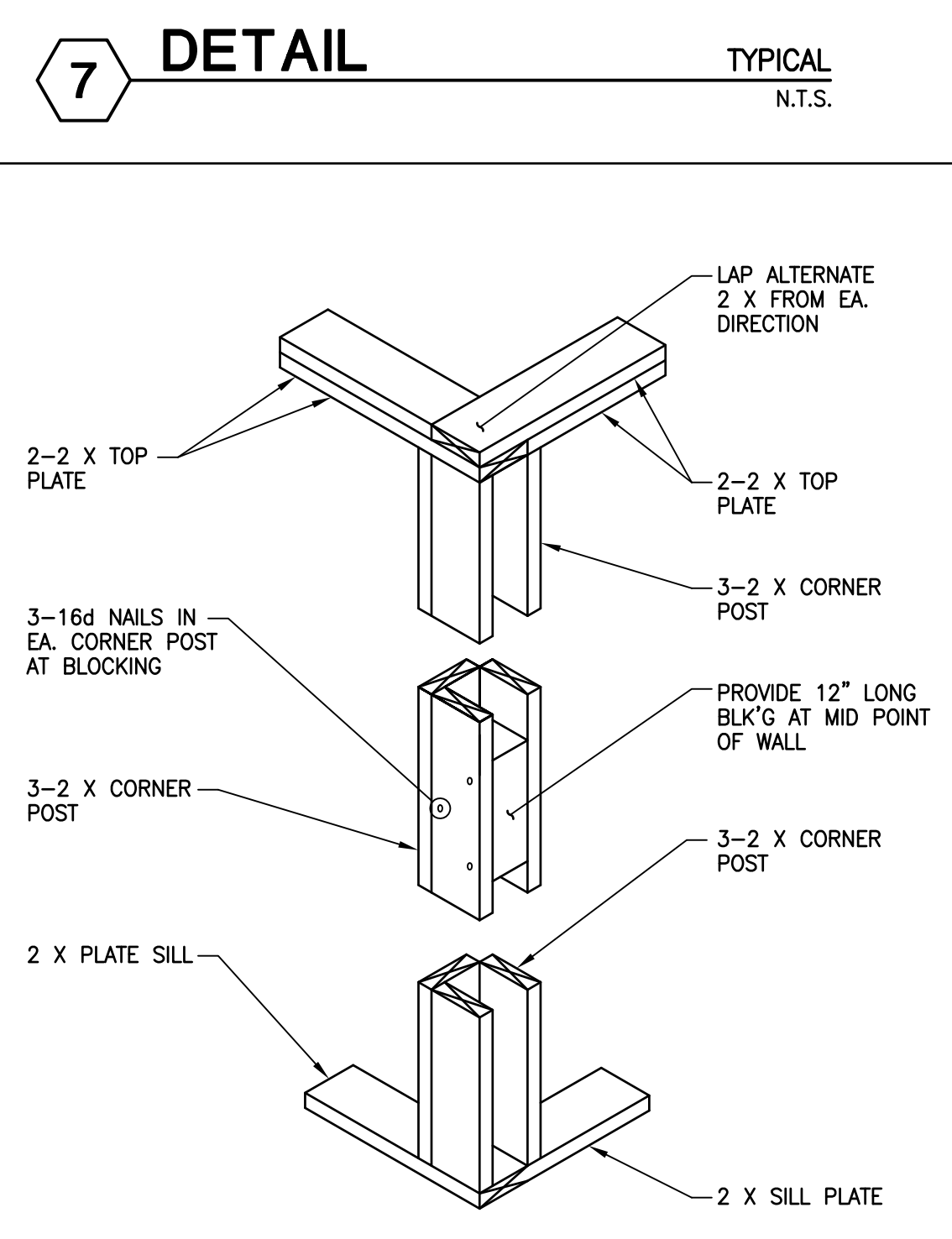
ALL TOP FLOOR NON LOAD BEARING HEADERS SHALL BE 1-2x4 FLAT.

WF-17 CONVENTIONAL FRAMING FORMING ROOF ELEMENTS BUILT ABOVE ROOF TRUSSES SHALL BE CONSTRUCTED ON ACCORDANCE WITH THE FOLLOWING TABLE:

NOMINAL SIZE LUMBER	SPACING	MAXIMUM SPAN
2x6	24" o.c.	10'
2x6	16" o.c.	12'
2x8	24" o.c.	16'

WF-18 PROVIDE PONY WALL CONSTRUCTION AT WALL BETWEEN TRUSS FRAMING AT WALLS WHERE ROOF LOAD IS BEARING ON WALLS ABOVE.

WF-19 MINIMUM BEARING FOR TRUSSES: 3-1/2". STEEL STAIR STRINGERS: 10" CHANNELS.



PREFABRICATED TRUSS NOTES:

PT-1 DESIGN OF PLATE CONNECTED TRUSSES SHALL CONFORM TO NATIONAL DESIGN STANDARDS (NDS-2005), TRUSS PLATE INSTITUTE CRITERIA (TPI-2007), AND THE INTERNATIONAL BUILDING CODE (IBC-2012). STEEL GUSSET PLATES SHALL BE MINIMUM 20 GAUGE, ASTM A-446 GRADE A, APPROVED BY ICBO.

MINIMUM PROPERTIES: CHORD LUMBER
 ALLOWABLE BENDING STRESS1,500 PSI
 MODULUS OF ELASTICITY1,600,000 PSI

MINIMUM PROPERTIES: WEB LUMBER
 ALLOWABLE BENDING STRESS 850 PSI
 MODULUS OF ELASTICITY1,400,000 PSI

MAXIMUM MOISTURE CONTENT 19% AT TIME OF FABRICATION

PT-2 TRUSS DESIGN AND LAYOUTS SHALL BE SEALED BY A TEXAS LICENSED PROFESSIONAL ENGINEER AND SUBMITTED TO ARCHITECT/ENGINEER FOR APPROVAL.

PT-3 TRUSS FABRICATION SHALL COMPLY WITH TPI QUALITY CONTROL STANDARDS (QCM-2007). TRUSS PLANT SHALL BE INSPECTED BY THIRD PARTY CERTIFIED AGENCY.

PT-4 TRUSSES SHALL BE ERECTED, BRACED, AND BLOCKED IN ACCORDANCE WITH BUILDING COMPONENT SAFETY INFORMATION (BCSI 1-03) BY TPI, AND THE SPECIFICATIONS OF THE STRUCTURAL ENGINEER.

REVISED ISSUE DATES:

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AN APARTMENT RESTORATION T L SHALEY APARTMENTS 4827 PATTUS SAN ANTONIO, TEXAS, 78228

PROJECT NO. 17-019
 ISSUE DATE: 02.22.18
 DRAWN BY: DJM
 REVIEWED BY: SJF
 PROJECT ARCHITECT:
 GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

7. WOOD CONSTRUCTION		IBC 1704.6	
A. PREFABRICATED STRUCTURAL ELEMENTS & ASSEMBLIES	PERIODIC	INSPECT STRUCTURAL LOAD BEARING MEMBERS AND ASSEMBLIES. VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. THE SPECIAL INSPECTOR SHALL REVIEW THE PROCEDURES FOR CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK. EXCEPTION: SPECIAL INSPECTIONS SHALL NOT BE REQUIRED WHERE THE FABRICATOR IS ENROLLED IN A NATIONALLY ACCEPTED INSPECTIONS PROGRAM ACCEPTABLE TO THE REGISTERED DESIGN PROFESSIONAL IS RESPONSIBLE CHARGE.	IBC 1705.5 TECHNICAL REPRESENTATIVE UNDER DIRECTION OF LICENSED ENGINEER
B. SITE BUILT ASSEMBLIES	PERIODIC	SITE BUILT ASSEMBLIES SHALL BE INSPECTED IN ACCORDANCE WITH IBC SECTION 1704.1	IBC 1705.5 LICENSED ENGINEER OR HIS/HER REPRESENTATIVE.
C. DIAPHRAGMS	PERIODIC	HIGH LOAD DIAPHRAGMS SHALL BE INSPECTED IN ACCORDANCE WITH IBC SECTION 1704.1, AND SHEATHING CHECKED FOR PROPER GRADE, THICKNESS, SIZE OF FRAMING MEMBERS AT ADJOINING PANEL EDGES, NAIL/STAPLE DIAMETER AND LENGTH, AND FASTENER PATTERN.	IBC 1705.5.1
D. TRUSS BRACING	PERIODIC	CHECK ALL REQUIRED PERMANENT AND LATERAL BRACING HAS BEEN INSTALLED ACCORDING TO STRUCTURAL DRAWINGS AND FABRICATOR DESIGN/SHOP DRAWINGS.	
8. LIGHT GAGE FRAME CONSTRUCTION		IBC 1704.13	
A. PREFABRICATED STRUCTURAL ELEMENTS & ASSEMBLIES	N/A	INSPECT STRUCTURAL LOAD BEARING MEMBERS AND ASSEMBLIES. VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL PROCEDURES THAT PROVIDE A BASIS FOR INSPECTION CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. THE SPECIAL INSPECTOR SHALL REVIEW THE PROCEDURES FOR CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK. EXCEPTION: SPECIAL INSPECTIONS SHALL NOT BE REQUIRED WHERE THE FABRICATOR IS ENROLLED IN A NATIONALLY ACCEPTED INSPECTIONS PROGRAM ACCEPTABLE TO THE REGISTERED DESIGN PROFESSIONAL IS RESPONSIBLE CHARGE.	IBC 1705.5.1 TECHNICAL REPRESENTATIVE UNDER DIRECTION OF LICENSED ENGINEER
B. SITE BUILT ASSEMBLIES	N/A	SITE BUILT ASSEMBLIES SHALL BE INSPECTED IN ACCORDANCE WITH IBC SECTION 1704.1	IBC 1705.5.1 LICENSED ENGINEER OR HIS/HER REPRESENTATIVE.
C. DIAPHRAGMS	N/A	HIGH LOAD DIAPHRAGMS SHALL BE INSPECTED IN ACCORDANCE WITH IBC SECTION 1704.1, AND SHEATHING CHECKED FOR PROPER GRADE, THICKNESS, SIZE OF FRAMING MEMBERS AT ADJOINING PANEL EDGES, NAIL/STAPLE DIAMETER AND LENGTH, AND FASTENER PATTERN.	IBC 1705.10.3
D. TRUSS BRACING	N/A	CHECK ALL REQUIRED PERMANENT AND LATERAL BRACING HAS BEEN INSTALLED ACCORDING TO STRUCTURAL DRAWINGS AND FABRICATOR DESIGN/SHOP DRAWINGS.	

DEFERRED SUBMITTALS			
BUILDING CONSTRUCTION	YES	NO	DESCRIPTION
STEEL		X	X
CONCRETE		X	X
WOOD	X		PRE-FAB TRUSSES

LEVEL 1 INSPECTION CONT.:				
C. PRIOR TO GROUTING, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:	N/A	1. GROUT SPACE IS CLEAN.		
	N/A	2. PLACEMENT OF REINFORCEMENT AND CONNECTORS AND PRESTRESSING TENDONS AND ANCHORAGES.		
	N/A	3. PROPORTIONS OF SITE-PREPARED GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS.		
	N/A	4. CONSTRUCTION OF MORTAR JOINTS.		
D. GROUT PLACEMENT	N/A	1. VERIFY COMPLIANCE WITH CODE AND CONSTRUCTION DOCUMENTS PROVISIONS.		
	N/A	2. GROUTING OF PRESTRESSING BONDED TENDONS.		
E. PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS SHALL BE OBSERVED.	N/A	1. VERIFY COMPLIANCE WITH CODE AND CONSTRUCTION DOCUMENTS PROVISIONS.		QUALIFICATIONS BASED ON C1093
F. COMPLIANCE WITH REQUIRED INSPECTION PROVISION OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED.	N/A	1. VERIFY COMPLIANCE WITH CODE AND CONSTRUCTION DOCUMENTS PROVISIONS.		
G. TESTING OF GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS.	N/A	1. TEST ONE SET OF MORTAR CUBES PER 2000 sf OR PORTION THEREOF. 2. TEST ONE SET OF GROUT CYLINDERS PER 2000 sf OR PORTION THEREOF. 3. TEST ONE PRISM PER 6000 sf OR PORTION THEREOF. (SUBMITTED PRISM WILL BE ACCEPTABLE FOR FIRST PRISM TEST).		QUALIFICATIONS BASED ON C1093
H. POST INSTALLED REINFORCING & ANCHORS (EXPANSION ANCHORS, SCREW ANCHORS ADHESIVE ANCHORS, ECT.).	N/A	THE SPECIAL INSPECTOR SHALL BE ON THE JOB SITE CONTINUOUSLY DURING ANCHOR INSTALLATION TO VERIFY ANCHOR TYPE, ANCHOR DIMENSIONS, MASONRY TYPE AND COMPRESSION STRENGTH, PRE DRILLED HOLE DIMENSIONS, ANCHOR SPACING, EDGE DISTANCES, MASONRY THICKNESS AND ANCHOR EMBEDMENT.	ACI 318 APPENDIX D-CH. D.9.1	*QUALIFICATIONS BASED ON ASTM E329 & ASTM C1077 OR CERTIFIED MANUFACTURER REPRESENTATIVE
LEVEL 2 INSPECTION:				
		ENGINEERED MASONRY IN ESSENTIAL FACILITIES.	IBC 1704.5.3	QUALIFICATIONS BASED ON C1093
A. FROM THE BEGINNING OF MASONRY CONSTRUCTION, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:	N/A	1. PROPORTIONS OF SITE-PREPARED MORTAR, GROUT, AND PRESTRESSING GROUT FOR BONDED TENDONS.		
	N/A	2. PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS.		
	N/A	3. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND PRESTRESSING TENDONS AND ANCHORAGES.		
	N/A	4. GROUT SPACE PRIOR TO GROUTING.		
	N/A	5. PLACEMENT OF GROUT.		
	N/A	6. PLACEMENT OF PRESTRESSING GROUT.		
B. THE INSPECTION PROGRAM SHALL VERIFY:	N/A	1. SIZE AND LOCATION OF STRUCTURAL ELEMENTS.		
	N/A	2. TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION.		
	N/A	3. SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT.		
	N/A	4. WELDING OF REINFORCEMENT.		
	N/A	PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40 DEGREES F) OR HOT WEATHER (TEMPERATURE ABOVE 90 DEGREES F).		
	N/A	6. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE.		
C. PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS SHALL BE OBSERVED.	N/A	1. VERIFY COMPLIANCE WITH CODE AND CONSTRUCTION DOCUMENTS PROVISIONS.		QUALIFICATIONS BASED ON C1093
D. COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED.	N/A			
E. TESTING OF GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS.	N/A	1. TEST ONE SET OF MORTAR CUBES PER 2000 sf OR PORTION THEREOF. 2. TEST ONE SET OF GROUT CYLINDERS PER 2000 sf OR PORTION THEREOF. 3. TEST ONE PRISM PER 6000 sf OR PORTION THEREOF. (SUBMITTED PRISM WILL BE ACCEPTABLE FOR FIRST PRISM TEST).		QUALIFICATIONS BASED ON C1093




3. STEEL CONSTRUCTION CONT.:				
G. STEEL FRAME JOINT DETAILS; COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS:	N/A	1. DETAILS SUCH AS BRACING & STIFFENING.	IBC 1705.2.1; STRUCTURAL DRAWINGS	PROJECT OF COMPLEX DETAILS: - ASSOCIATE CWI PROJECTS OF RELATIVELY SIMPLE DETAILS: - TECHNICIAN TRAINED IN FIELD OF WORK AND HAS AT LEAST ONE YEAR OF EXPERIENCE.
	N/A	2. MEMBER LOCATIONS.		
	N/A	3. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.		
H. POST INSTALLED REINFORCING & ANCHORS (EXPANSION ANCHORS, SCREW ANCHORS ADHESIVE ANCHORS, ECT.).	N/A	THE SPECIAL INSPECTOR SHALL BE ON THE JOB SITE CONTINUOUSLY DURING ANCHOR INSTALLATION TO VERIFY ANCHOR TYPE, ANCHOR DIMENSIONS, CONCRETE OR MASONRY TYPE AND COMPRESSION STRENGTH, PRE DRILLED HOLE DIMENSIONS, ANCHOR SPACING, EDGE DISTANCES, CONCRETE OR MASONRY THICKNESS AND ANCHOR EMBEDMENT.	ACI 318 APPENDIX D-CH. D.9.1	*QUALIFICATIONS BASED ON ASTM E329 & ASTM C1077 OR CERTIFIED MANUFACTURER REPRESENTATIVE
5. INSPECTION OF FABRICATORS FOR STRUCTURAL STEEL				
FABRICATION & IMPLEMENTATION PROCEDURES	N/A	FABRICATION AND IMPLEMENTATION PROCEDURES. THE SPECIAL INSPECTOR SHALL VERIFY THAT THE FABRICATOR MAINTAINS DETAILED FABRICATION AND QUALITY CONTROL OF THE WORKMANSHIP AND THE FABRICATOR'S ABILITY TO CONFORM TO APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS. THE SPECIAL INSPECTOR SHALL REVIEW THE PROCEDURES FOR COMPLETENESS AND ADEQUACY RELATIVE TO THE CODE REQUIREMENTS FOR THE FABRICATOR'S SCOPE OF WORK. EXCEPTION: SPECIAL INSPECTIONS SHALL NOT BE REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR THAT IS ENROLLED IN A NATIONALLY ACCEPTED INSPECTIONS PROGRAM ACCEPTABLE TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO BUILDING OFFICIAL UPON REQUEST AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.	IBC 1705.2.1	CWI, ASNT, LICENSED ENGINEER
6. MASONRY CONSTRUCTION				
EMPIRICALLY DESIGNED MASONRY, GLASS UNIT MASONRY, AND MASONRY VENEER IN NON-ESSENTIAL FACILITIES.	N/A		IBC 1705.4	
LEVEL 1 INSPECTION:	N/A	ENGINEERED MASONRY IN NON-ESSENTIAL FACILITIES AND EMPIRICALLY DESIGNED MASONRY IN ESSENTIAL FACILITIES.	IBC 1705.4	QUALIFICATIONS BASED ON ASTM C1093
A. AS MASONRY CONSTRUCTION BEGINS, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:	N/A	1. PROPORTIONS OF SITE-PREPARED MORTAR.		
	N/A	2. CONSTRUCTION OF MORTAR JOINTS.		
	N/A	3. LOCATION OF REINFORCEMENT AND CONNECTORS.		
	N/A	4. PRESTRESSING TECHNIQUE		
	N/A	5. GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGES.		
B. THE INSPECTION PROGRAM SHALL VERIFY:	N/A	1. SIZE AND LOCATION OF STRUCTURAL ELEMENTS.		
	N/A	2. TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION.		
	N/A	3. SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT.		
	N/A	4. WELDING OF REINFORCING BARS.		
	N/A	5. PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40 DEGREES F) OR HOT WEATHER (TEMPERATURE ABOVE 90 DEGREES F).		
	N/A	6. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE.		

NOTES:

- THESE INSPECTIONS DO NOT RELIEVE ENGINEER FROM STRUCTURAL OBSERVATIONS AS MAY REQUIRED BY IBC 2015, SECTION 1709, AND/OR CONTRACTUAL REQUIREMENTS OF ARCHITECT/CLIENT, (I.E. C141).
- DEFINITIONS/TERM: PERIODIC VS. CONTINUOUS INSPECTIONS - REF. IBC SECTION 1702
 ADSC - THE INTERNATIONAL ASSOCIATION OF FOUNDATION DRILLING
 ASNT - AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING
 ASTM - AMERICAN SOCIETY FOR TESTING MATERIALS
 AWS - AMERICAN WELDING SOCIETY
 CWI - CERTIFIED WELDING INSPECTOR
 CRSI - CONCRETE REINFORCING STEEL INSTITUTE
 PCI - PRECAST/PRESTRESSED CONCRETE INSTITUTE
 PTI - POST-TENSIONING INSTITUTE
 N/A - NOT APPLICABLE

*TESTING AND INSPECTION DIRECTED BY ASTM E329 GUIDELINES.

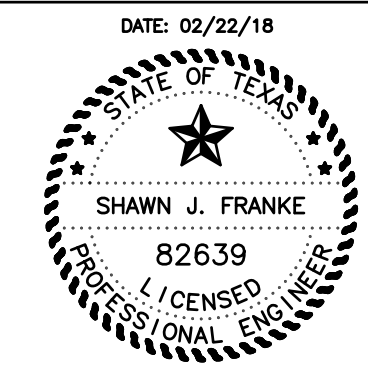
REVISED ISSUE DATES:

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AN APARTMENT RESTORATION
T L SHALEY APARTMENTS
4827 PETTUS
SAN ANTONIO, TEXAS, 78228

PROJECT NO. 17-019
 ISSUE DATE: 02.22.18
 DRAWN BY: DJM
 REVIEWED BY: SJF
 PROJECT ARCHITECT:
 GABRIEL DURAND-HOLLIS, FAIA
 TEXAS LICENSE NO. 10881

LUNDY & FRANKE
ENGINEERING
549 HEIMER ROAD 78232
SAN ANTONIO, TEXAS PH. (210)979-7900 FX. (210)979-7800



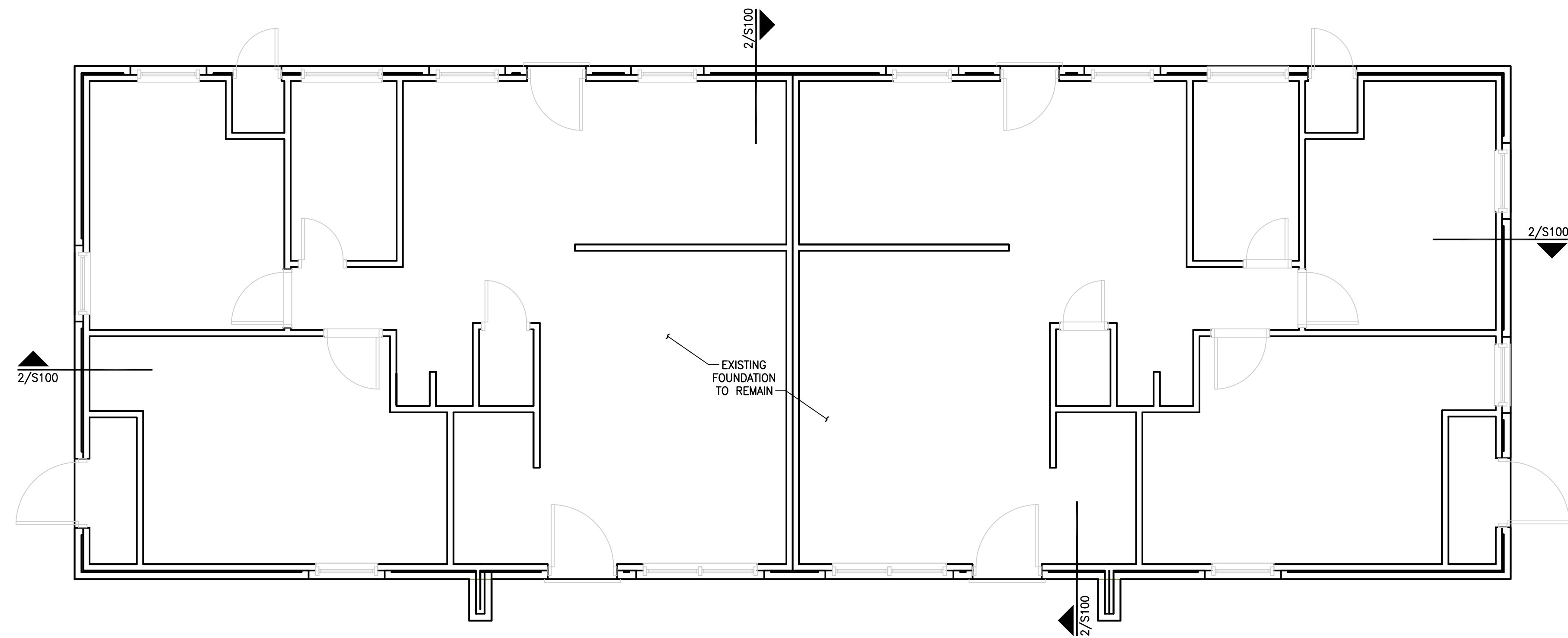
Shawn Franke



DURAND-HOLLIS RUPE ARCHITECTS, INC.
12758 CIMARRON PATH SUITE 126
SAN ANTONIO, TEXAS 78249
TEL. 210 308-0080
FAX. 210 697-3309
eMAIL OFFICE@DHRARCHITECTS.COM

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EXISTING FOUNDATION & WALL PLAN
SCALE: 1/4" = 1'-0"

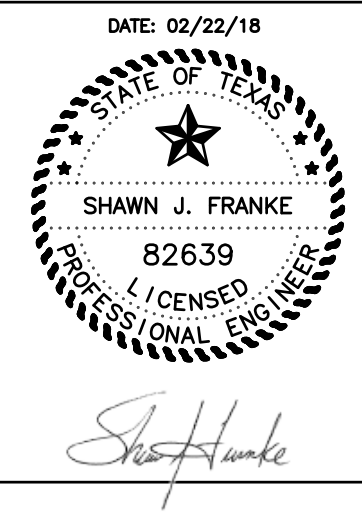
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S200

LA PROJECT NO.: 60-045-00
LA FILE NO.: TSPS200

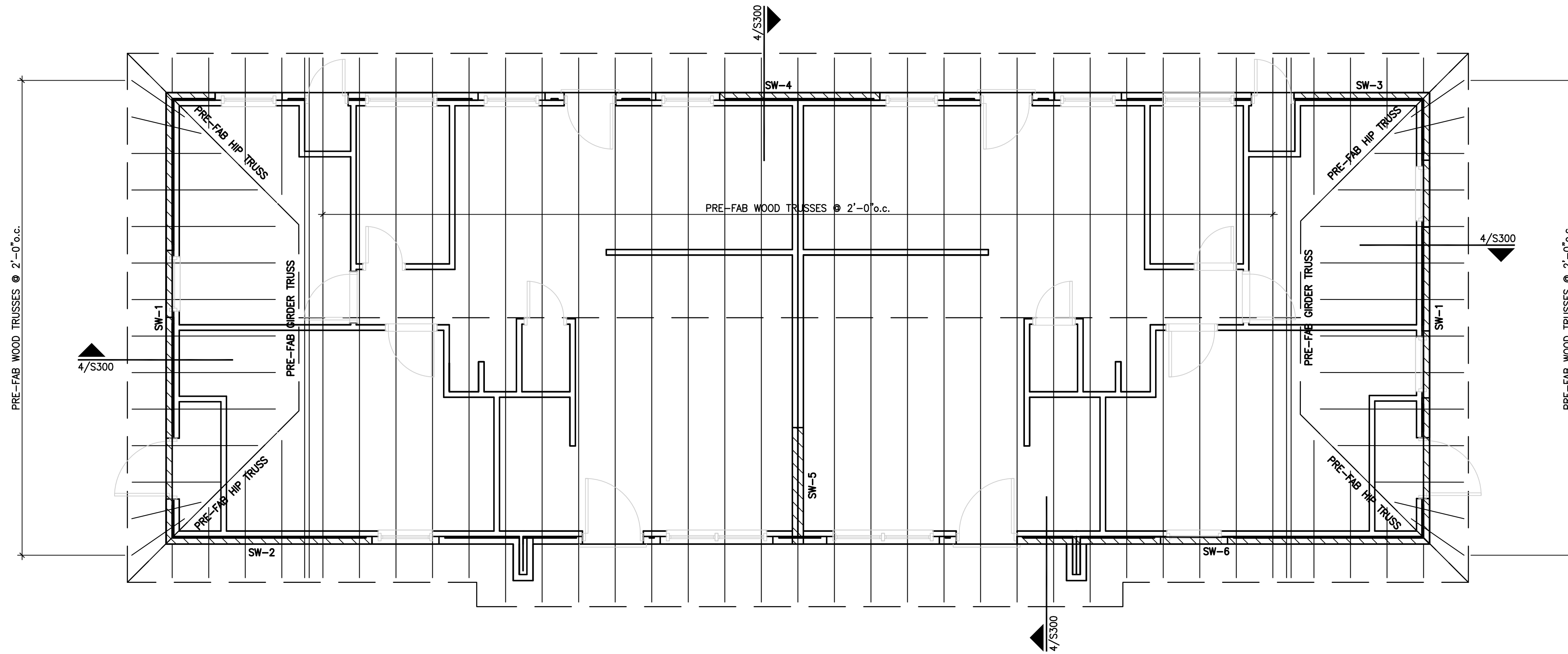
LUNDY & FRANKE
ENGINEERING
 549 HEIMER ROAD 78232
 SAN ANTONIO, TEXAS PH. (210)979-7900 FX. (210)979-7800



DHR ARCHITECTS
 DURAND-HOLLIS RUPE ARCHITECTS, INC.
 12758 CIMARRON PATH SUITE 126
 SAN ANTONIO, TEXAS 78249
 TEL. 210 308-0080
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ROOF FRAMING PLAN
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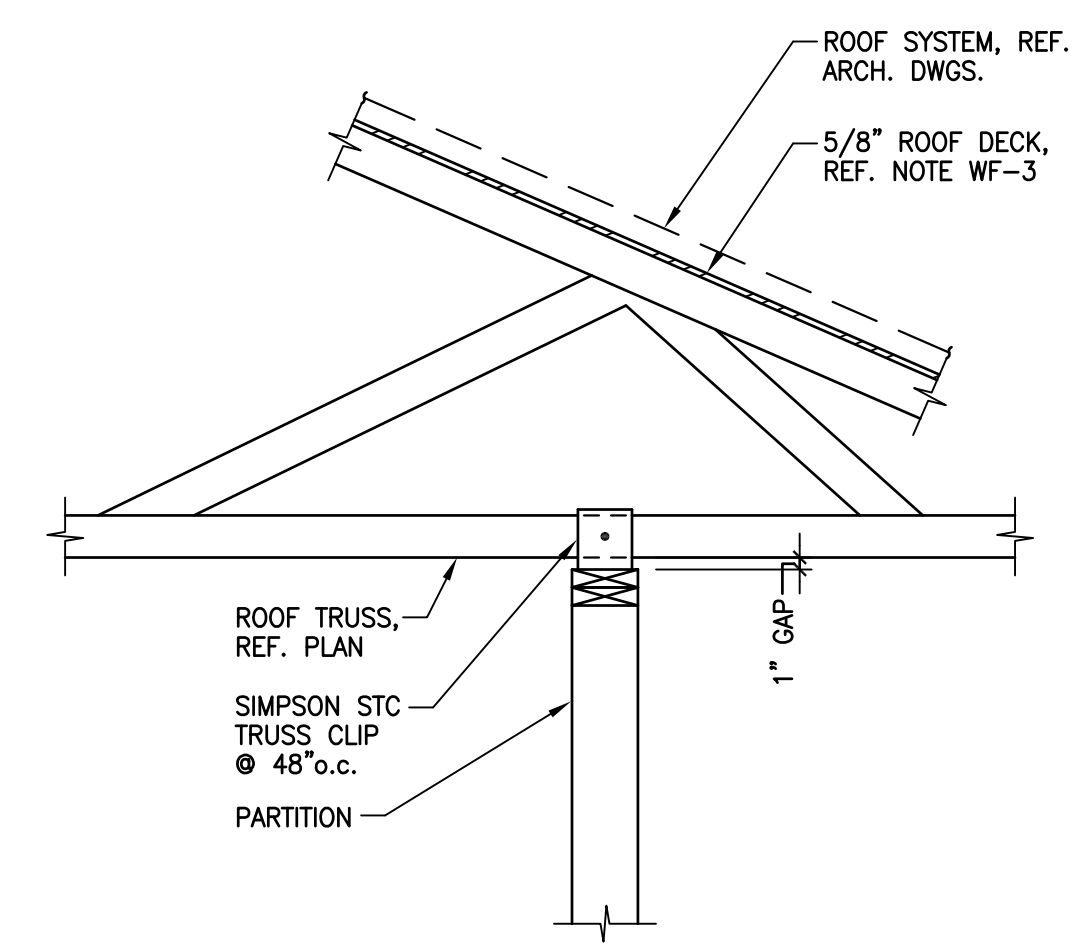
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S201

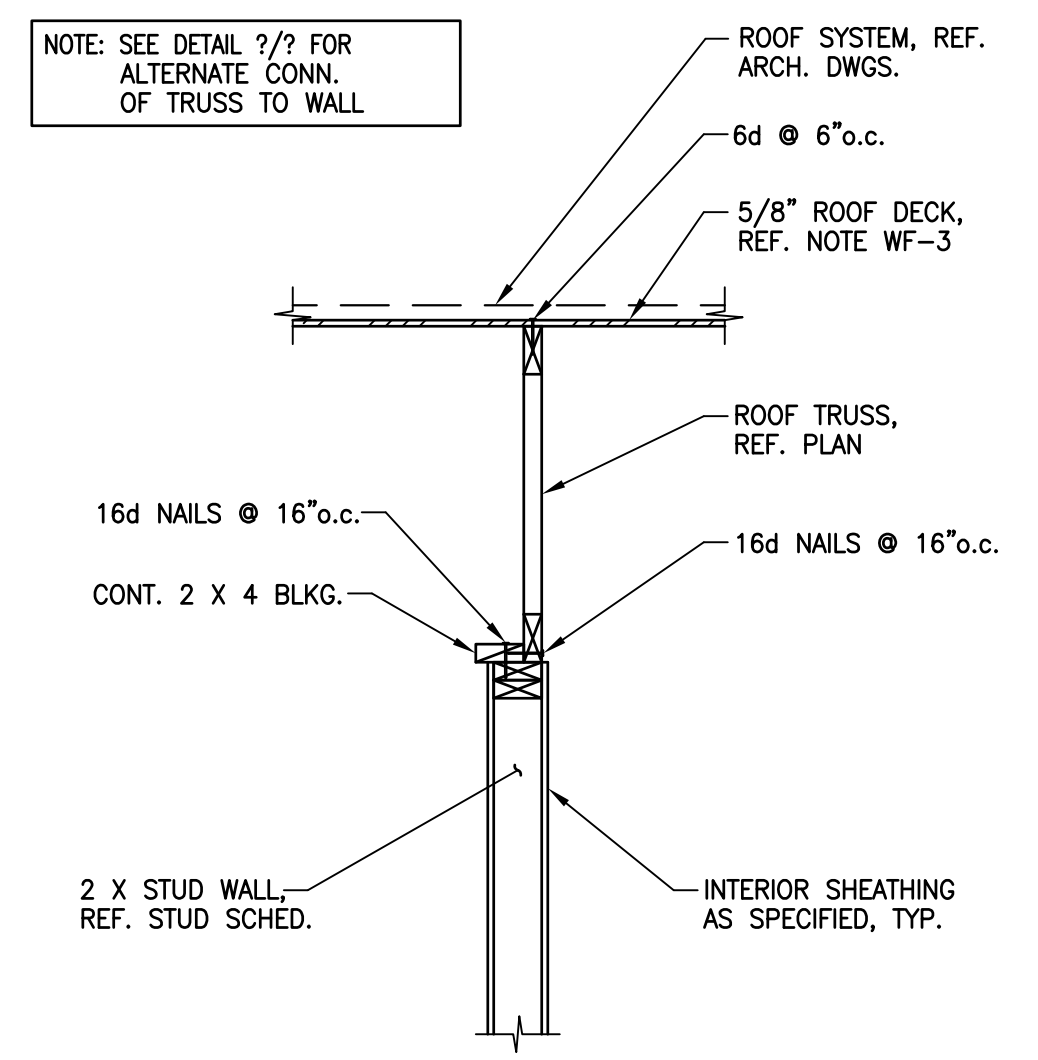
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REVISED ISSUE DATES:

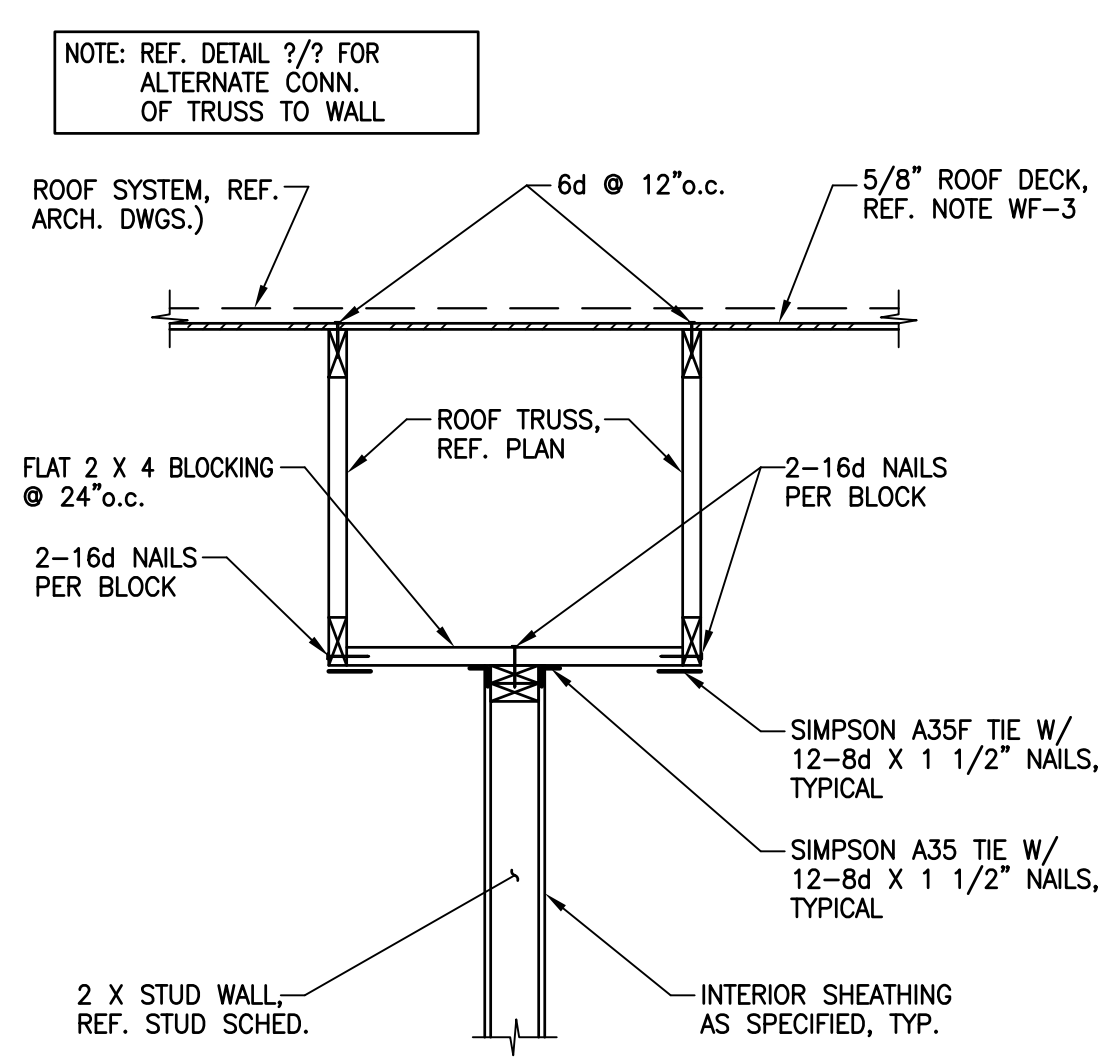
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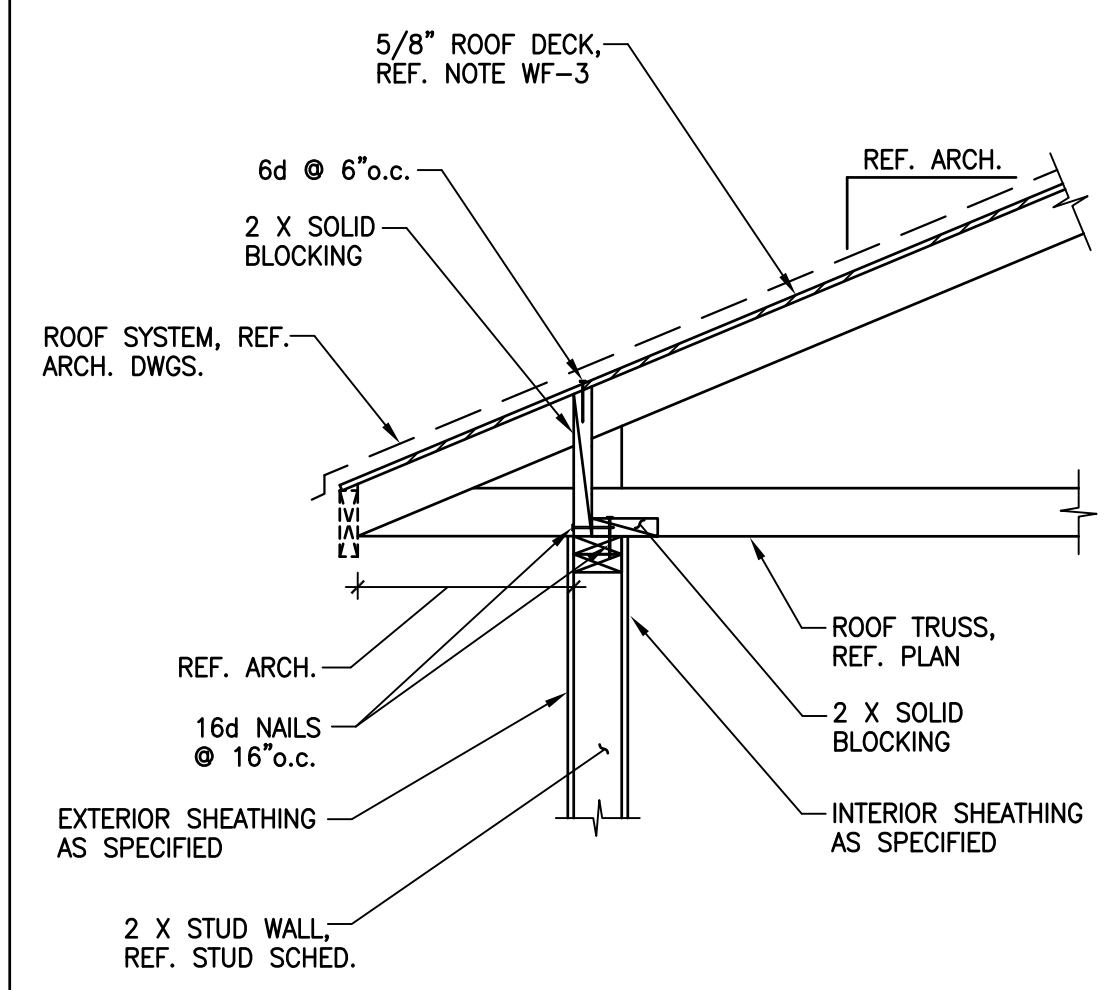
5 SECTION
SCALE: 3/4" = 1'-0"



2 DETAIL TYPICAL
N.T.S.



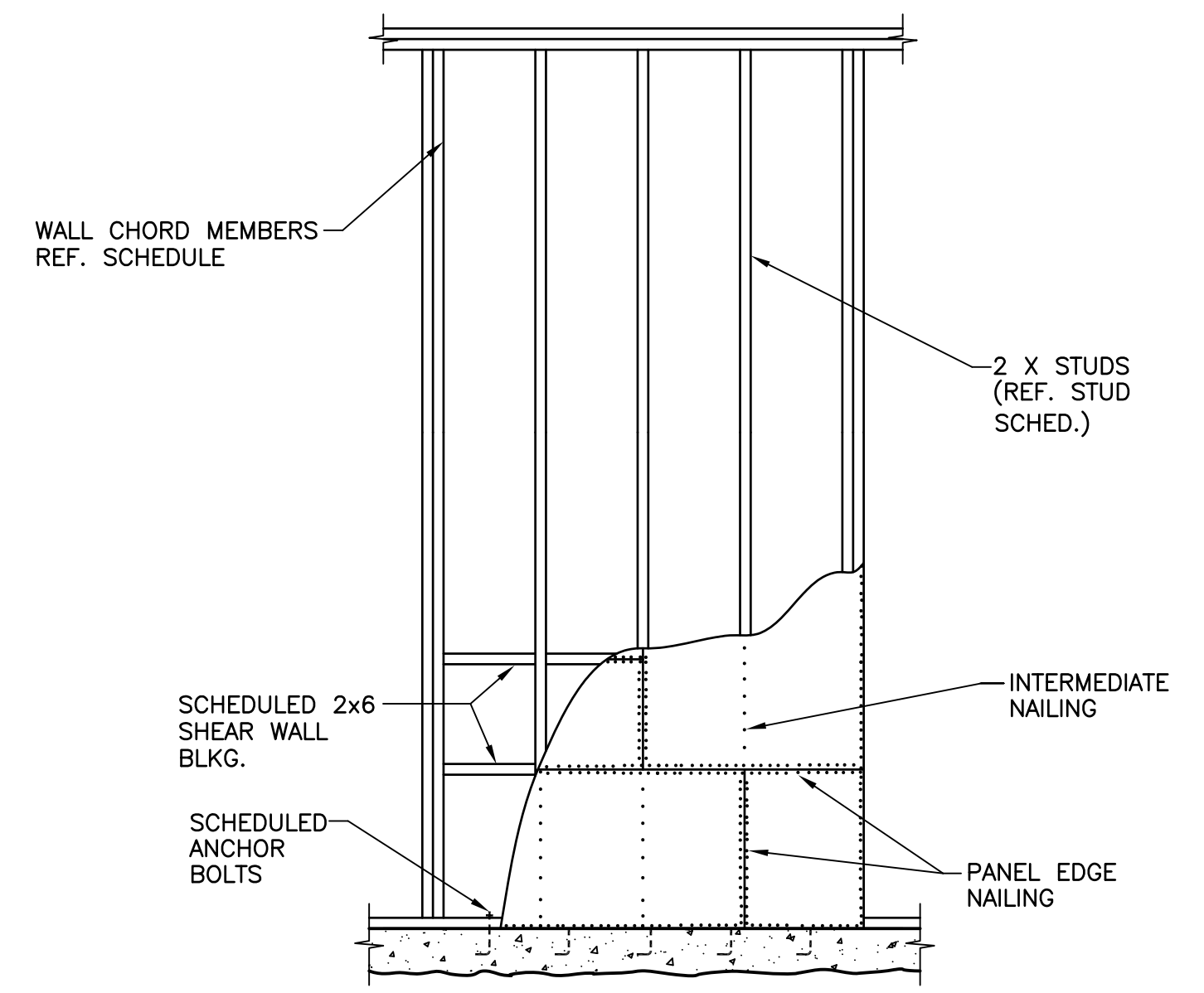
3 DETAIL TYPICAL
N.T.S.



4 SECTION
SCALE: 3/4" = 1'-0"

SHEARWALL SCHEDULE					
MARK	WALL CONSTRUCTION	WALL ANCHORS	WALL CHORD MEMBER	MIN LENGTH	HOLD DOWN
SW-1	5/8" GYP. WALLBOARD INT. & 7/16" PLYWOOD SHEATHING BOARD EXT. (BLOCKED) W/ 8d COMMON @ 6"o.c. ALONG STUDS AND PLATES.	ROOF DECK = 16d @ 6"o.c. SILL PLATE = 1/2" A.B. @ 6'-0"o.c. MAX.	2-2x4 STUD	CONT.	NONE
SW-2	5/8" GYP. WALLBOARD INT. & 7/16" PLYWOOD SHEATHING BOARD EXT. (BLOCKED) W/ 8d COMMON @ 6"o.c. ALONG STUDS AND PLATES.	ROOF DECK = 16d @ 6"o.c. SILL PLATE = 1/2" A.B. @ 6'-0"o.c. MAX.	2-2x4 STUDS	=11'-0"	HDU4-SDS 2.5
SW-3	5/8" GYP. WALLBOARD INT. & 7/16" PLYWOOD SHEATHING BOARD EXT. (BLOCKED) W/ 8d COOLERS @ 6"o.c. ALONG STUDS, PLATES & BLKG.	SILL PLATE = 5/8" A.B. @ 3'-6"o.c. W/ 7" EMBED & 3" HOOK.	2-2x6 STUDS	=7'-6"	HDU4-SDS 2.5
SW-4	5/8" GYP. WALLBOARD INT. & 7/16" PLYWOOD SHEATHING BOARD EXT. (BLOCKED) W/ 8d COMMON @ 6"o.c. ALONG STUDS AND PLATES.	SILL PLATE = 1/2" A.B. @ 6'-0"o.c. W/ 7" EMBED & 3" HOOK.	2-2x4 STUDS	=9'-0"	DTT2Z
SW-5	5/8" GYP. WALLBOARD INT. & 5/8" GYP. SHEATHING BOARD EXT. (BLOCKED) W/ 6d COOLERS @ 7"o.c. ALONG STUDS AND PLATES.	SILL PLATE = 5/8" A.B. @ 4'-0"o.c. W/ 7" EMBED & 3" HOOK.	2-2x4 STUDS	=7'-0"	DTT2Z
SW-6	5/8" GYP. WALLBOARD INT. & 7/16" PLYWOOD SHEATHING BOARD EXT. (BLOCKED) W/ 8d COMMON @ 6"o.c. ALONG STUDS AND PLATES.	ROOF DECK = 16d @ 6"o.c. SILL PLATE = 1/2" A.B. @ 6'-0"o.c. MAX.	2-2x4 STUD	=22'-0"	NONE

SHEAR WALL NOTES:
SW-1 ANCHOR BOLTS, U.N.O., SHALL BE A307, GRADE A.
SW-2 BLOCKED NOTATION REQUIRES THAT ALL PANEL EDGES TO BE BLOCKED W/ 2x BLKG. SAME SIZE AS STUD.
SW-3 BOLT HOLES IN WOOD SHALL BE 1/32" LARGER THAN BOLT DIAMETER.



1 DETAIL TYPICAL
N.T.S.

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S300

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04/10/18

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PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH

ELECTRICAL SYMBOLS & ABBREVIATIONS

E0.0

HM3
 ENGINEERING
 CONSULTANTS

2902 NORTH FLORES
 SAN ANTONIO, TEXAS 78212
 210.393.1840 PHONE
 SAN ANTONIO - RGV
 T8PE FIRM REGISTRATION NO. 13361

ELECTRICAL SYMBOLS		MOTORS AND CONTROLS		RACEWAYS AND WIRING		MISCELLANEOUS	
<p>P</p> <p>P POLE, PUMP PH PANEL POS POINT OF SALE PP POWER POLE PR PAIR PWR POWER</p> <p>Q</p> <p>QTY QUANTITY</p> <p>R</p> <p>R EXISTING TO BE REMOVED RA RETURN AIR RCP REFLECTED CEILING PLAN RCPT RECEPTACLE RE REFERENCE, REFER REC RECEPTACLE REV REVISION, REVISE RGS RIGID GALVANIZED STEEL RTU ROOFTOP UNIT</p> <p>S</p> <p>SCHED SCHEDULE SEC SECONDARY SECT SECTION SF SQUARE FEET SPEC SPECIFICATION SPKR SPEAKER SPDT SINGLE-POLE, DOUBLE-THROW SPST SINGLE-POLE, SINGLE-THROW SQ SQUARE SW SWITCH SWBD SWITCHBOARD</p> <p>T</p> <p>TC TEMPERATURE CONTROL TEL TELEPHONE TF TRANSFER FAN TL TWIST-LOCK TOC TOP OF CURB TOS TOP OF STEEL TP CHILD TAMPER PROOF DEVICE TSTAT THERMOSTAT ITB TELEPHONE TERMINAL BOARD TTC TELEPHONE TERMINAL CABINET TU TERMINAL UNIT TV TELEVISION TVSS TRANSIENT VOLTAGE SURGE SUPPRESSOR TYP TYPICAL</p> <p>U</p> <p>UG UNDERGROUND UH UNIT HEATER UL UNDERWRITERS LABORATORIES, INC. UNO UNLESS NOTED OTHERWISE UPS UNINTERRUPTABLE POWER SYSTEM</p> <p>V</p> <p>V VOLT VA VOLT-AMPERE VAV VARIABLE AIR VOLUME VC VOLUME CONTROL VERT VERTICAL VFD VARIABLE FREQUENCY DRIVE VP VACUUM PUMP VM VOLT METER</p> <p>W</p> <p>W WATT, WIRE, WIDTH WG WIREGUARD W/ WITH W/O WITHOUT WP WEATHERPROOF WS WATER SOFTENER WT WATERTIGHT, WEIGHT WWF WELDED WIRE FABRIC</p> <p>X</p> <p>XFMR TRANSFORMER</p> <p>Z</p> <p>Z ZONE</p>	<p>ELECTRICAL SYMBOLS</p> <p>MOTORS AND CONTROLS</p> <p>Ⓢ SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER</p> <p>Ⓛ ELECTRIC DUCT HEATER</p> <p>Ⓛ DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE. "N" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R</p> <p>Ⓛ ENCLOSURE CIRCUIT BREAKER - "200/3/150" DENOTES AMPERES/POLE/TRIP.</p> <p>Ⓛ MOTOR STARTER FURNISHED BY DIVISION 15 AND INSTALLED BY DIVISION 16.</p> <p>Ⓛ COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/40" DENOTES AMPERES/POLES/FUSE/STARTER SIZE. "N" DENOTES NON-FUSED, FURNISHED BY DIVISION 15 AND INSTALLED BY DIVISION 16.</p> <p>Ⓛ VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 15 AND INSTALLED BY DIVISION 16.</p> <p>Ⓛ EMERGENCY POWER OFF BUTTON.</p> <p>RECEPTACLES AND OUTLETS</p> <p>Ⓛ ALL RECEPTACLES SHALL BE MOUNTED 16" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.</p> <p>Ⓛ SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.</p> <p>Ⓛ DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. "EM" DENOTES EMERGENCY CIRCUIT. PROVIDE RED RECEPTACLE AND FACEPLATE. "GFI" DENOTES GROUND FAULT INTERRUPTER. "WP" DENOTES WEATHERPROOF. "IG" DENOTES ISOLATED GROUND. "TP" DENOTES SAFETY TYPE, (TAMPER PROOF) "DR" DENOTES DROPPED RECEPTACLE. "AC" DENOTES ABOVE COUNTER MOUNTING. SEE ARCHITECTURAL PLANS FOR EXACT MOUNTING HEIGHT.</p> <p>Ⓛ DUPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.</p> <p>Ⓛ DUPLEX WALL RECEPTACLE ON A CIRCUIT DEDICATED TO DATA PROCESSING, GRAY COLOR. PROVIDE ISOLATED GROUND TYPE RECEPTACLES WHERE NOTED.</p> <p>Ⓛ SPLIT WIRED RECEPTACLE. TOP RECEPTACLE SHALL BE SWITCHED ACCORDING TO PLANS, AND BOTTOM SHALL REMAIN UNSWITCHED.</p> <p>Ⓛ FOURPLEX (DOUBLE DUPLEX) WALL RECEPTACLE. NEMA 5-20R, 20A, 125V.</p> <p>Ⓛ FOURPLEX WALL RECEPTACLE ON EMERGENCY CIRCUIT, RED COLOR.</p> <p>Ⓛ SPECIAL RECEPTACLE, NEMA CONFIGURATION AS NOTED.</p> <p>Ⓛ FLUSH ELECTRICAL FLOOR OUTLET, "P" DENOTES POKE-THRU. "D" INDICATES DUPLEX RECEPTACLE. "R" INDICATES RED RECEPTACLE ON EMERGENCY POWER</p> <p>Ⓛ MULTI-OUTLET SURFACE RACEWAY. SEE ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHTS.</p> <p>Ⓛ JUNCTION BOX (SQUARE)</p> <p>Ⓛ JUNCTION BOX</p> <p>Ⓛ DUPLEX RECEPTACLE WITH HOMERUN</p> <p>Ⓛ DUPLEX RECEPTACLE (PEDESTAL MOUNTED)</p> <p>Ⓛ TWO-GANG FLOOR OUTLET</p> <p>Ⓛ THREE-GANG FLOOR OUTLET</p> <p>Ⓛ POWER POLE</p> <p>Ⓛ DIRECT CONNECTION TO EQUIPMENT</p> <p>Ⓛ PULL BOX (OVER 4" SQUARE)</p> <p>Ⓛ TENANT LIGHTING JUNCTION BOX</p> <p>Ⓛ TENANT POWER JUNCTION BOX</p> <p>Ⓛ CLOCK RECEPTACLE TO BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK. (1) SINGLE SIDED. NO NUMBER MEANS CLOCK TO MOUNTED WITH BACK SURFACE MOUNTED ON WALL</p> <p>LIGHTING</p> <p>Ⓛ LETTER(S) DENOTE TYPE - SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.</p> <p>Ⓛ 2' X 4' FLUORESCENT LIGHTING FIXTURE.</p> <p>Ⓛ 2' X 2' FLUORESCENT LIGHTING FIXTURE.</p> <p>Ⓛ 1' X 4' FLUORESCENT LIGHTING FIXTURE.</p> <p>Ⓛ 1' X 2' FLUORESCENT LIGHTING FIXTURE.</p> <p>Ⓛ 1' X 1' FLUORESCENT LIGHTING FIXTURE.</p> <p>Ⓛ FLUORESCENT STRIP LIGHTING FIXTURES.</p> <p>Ⓛ STAGGERED STRIP LIGHTING FIXTURE.</p> <p>Ⓛ INCANDESCENT, FLUORESCENT OR HID DOWNLIGHT FIXTURE.</p> <p>Ⓛ WALL MOUNTED INCANDESCENT, FLUORESCENT OR HID FIXTURE.</p> <p>Ⓛ TRACK LIGHTING FIXTURE, MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.</p> <p>Ⓛ CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.</p> <p>Ⓛ WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.</p> <p>Ⓛ EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.</p> <p>Ⓛ HID SECURITY WALL PACK</p>	<p>RACEWAYS AND WIRING</p> <p>Ⓛ CAP AND STAKE</p> <p>Ⓛ CONDUIT CONCEALED IN WALL OR CEILING</p> <p>Ⓛ CONDUIT UNDERSLAB OR UNDERGROUND</p> <p>Ⓛ EMERGENCY CONDUIT</p> <p>Ⓛ EXPOSED CONDUIT</p> <p>Ⓛ UNDERGROUND CONDUIT, "DB" DENOTES DUCTBANK ENCASED IN CONCRETE</p> <p>Ⓛ OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE</p> <p>Ⓛ CONDUIT TURNED UP</p> <p>Ⓛ CONDUIT TURNED DOWN</p> <p>Ⓛ HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT: PHASE/NEUTRAL/SWITCH LEG/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES 2# 12, PLUS GROUND, UNLESS NOTED OTHERWISE.</p> <p>Ⓛ HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.</p> <p>Ⓛ PARTIAL CIRCUIT HOMERUN TO PANEL.</p> <p>Ⓛ COMMUNICATIONS CONDUIT OR CABLE: "C" DENOTES MASTER CLOCK, "CA" DENOTES MASTER CLOCK, "CR" DENOTES CASH REGISTER "D" DENOTES DATA, "FA" DENOTES FIRE ALARM, "I" DENOTES INTERCOM, "OHE" DENOTES OVERHEAD ELECTRICAL LINE. "PA" DENOTES PAGING, "S" DENOTES SECURITY, "T" DENOTES TELEPHONE, "V" DENOTES VIDEO, TELECOMMUNICATIONS CABLE TRAY TO BE CONCEALED ABOVE ACCESSABLE CEILING.</p> <p>ELECTRICAL EQUIPMENT</p> <p>Ⓛ DISTRIBUTION PANEL</p> <p>Ⓛ SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER</p> <p>Ⓛ PANELBOARD (FLUSH/SURFACE MOUNT)</p> <p>Ⓛ FLOOR MOUNTED DRY-TYPE TRANSFORMER</p> <p>COMMUNICATIONS</p> <p>Ⓛ ALL RECEPTACLES SHALL BE MOUNTED 16" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.</p> <p>Ⓛ THE FOLLOWING NOTATIONS REFER TO ALL COMMUNICATIONS OUTLETS: "FAX" DENOTES OUTLET DEDICATED FOR A FAX. "W" DENOTES WALL PHONE SHALL BE MOUNTED AT 42" A.F.F. "PAY" DENOTES PAY PHONE SHALL BE MOUNTED 42" A.F.F.</p> <p>Ⓛ TELEPHONE WALL OUTLET.</p> <p>Ⓛ DATA WALL OUTLET.</p> <p>Ⓛ VOICE/DATA OUTLET</p> <p>Ⓛ FLUSH TELEPHONE FLOOR OUTLET, "P" DENOTES POKE-THRU</p> <p>Ⓛ FLUSH DATA FLOOR OUTLET, "P" DENOTES POKE-THRU</p> <p>Ⓛ FLUSH VOICE/DATA FLOOR OUTLET, "P" DENOTES POKE-THRU</p> <p>Ⓛ SCHOOL INTERCOMMUNICATION SYSTEM DESKSET.</p> <p>Ⓛ SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.</p> <p>Ⓛ TELEVISION OUTLET 1 GANG JUNCTION BOX WITH ONE FEMALE COAX BARREL CONNECTOR MOUNTED IN SINGLE GANG S.S. COVER PLATE.</p> <p>Ⓛ MICROPHONE FLOOR OUTLET, "W" INDICATES WALL MOUNTED</p> <p>Ⓛ CEILING MOUNTED SPEAKER. "VC" INDICATES VOLUME CONTROL ON SPEAKER.</p> <p>Ⓛ WALL MOUNTED SPEAKER.</p> <p>DRAWING/DETAIL REFERENCE KEY</p> <p>Ⓛ REFER TO DRAWING/DETAIL NUMBER</p> <p>Ⓛ SHEET NUMBER</p> <p>GENERAL NOTES</p> <p>Ⓛ A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.</p>	<p>MISCELLANEOUS</p> <p>Ⓛ SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.</p> <p>Ⓛ INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL</p> <p>Ⓛ DRAWING NOTE REFERENCE</p> <p>Ⓛ STARTER/DISCONNECT SCHEDULE REFERENCE</p> <p>Ⓛ FEEDER SCHEDULE REFERENCE</p> <p>Ⓛ LIGHTING CONTACTOR</p> <p>Ⓛ TIME SWITCH</p> <p>Ⓛ PHOTOCELL</p> <p>Ⓛ PUSH BUTTON</p> <p>Ⓛ TIMECLOCK</p> <p>Ⓛ RELAY</p> <p>FIRE ALARM</p> <p>Ⓛ WATER FLOW SWITCH</p> <p>Ⓛ SUPERVISORY SWITCH</p> <p>Ⓛ SMOKE DETECTOR - "0" INDICATES DUCT TYPE</p> <p>Ⓛ HEAT DETECTOR</p> <p>Ⓛ BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.</p> <p>Ⓛ BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.</p> <p>Ⓛ SPEAKER/VISUAL +80" A.F.F. - 15/75cd UNLESS NOTED OTHERWISE.</p> <p>Ⓛ MAGNETIC DOOR HOLDER</p> <p>Ⓛ AUXILIARY CONTROL RELAY</p> <p>Ⓛ FIRE ALARM PULL STATION +42" AFF</p> <p>Ⓛ FIREMAN'S TELEPHONE JACK +42" AFF</p> <p>Ⓛ AUDIO VISUAL FIRE ALARM HORN +80" AFF</p> <p>Ⓛ AUDIO FIRE ALARM HORN +80" AFF</p> <p>Ⓛ VISUAL FIRE ALARM (STROBE) +80" AFF</p> <p>Ⓛ FIRE ALARM CONTROL PANEL</p> <p>Ⓛ REMOTE FIRE ALARM ANNUNCIATOR PANEL</p> <p>Ⓛ FIRE ALARM VOICE EVACUATION PANEL</p> <p>Ⓛ FIRE ALARM SPEAKER / WALL MOUNTED</p> <p>Ⓛ MINI AUDIO FIRE ALARM HORN +80" AFF</p> <p>Ⓛ MINI AUDIO/VISUAL FIRE ALARM HORN +80" AFF</p> <p>Ⓛ FIRE FIGHTER HANDSET</p> <p>Ⓛ REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.</p> <p>Ⓛ FIRE SMOKE DAMPER</p> <p>Ⓛ VISUAL FIRE ALARM STROBE, CEILING MOUNTED</p> <p>Ⓛ AUDIO VISUAL FIRE ALARM HORN-CEILING MOUNTED</p> <p>Ⓛ FIRE ALARM SPEAKER / VISUAL - CEILING MOUNTED</p> <p>SWITCHES</p> <p>Ⓛ ALL SWITCHES SHALL BE MOUNTED AT 42" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE.</p> <p>Ⓛ SWITCH, SPST, 20A, 120/277V.</p> <p>Ⓛ SWITCH, 20A, 120/277V: "2" DENOTES DPST, "3" DENOTES THREE-WAY, "4" DENOTES FOUR-WAY, "K" DENOTES KEY SWITCH, "P" DENOTES PILOT LIGHT, "ST" DENOTES SPRING WOUND TIMER. "R" DENOTES RED "F" FAN SPEED CONTROLLER "OC" OCCUPANCY SENSOR "L" DENOTES LOCKING SWITCH</p> <p>Ⓛ SWITCH, SPDT, CENTER OFF, MOMENTARY CONTACT.</p> <p>Ⓛ DIMMER CONTROL SWITCH, 600 WATT UNLESS OTHERWISE NOTED.</p> <p>Ⓛ THREE-WAY KEY SWITCH, 20A, 120/277V.</p> <p>Ⓛ WALL MOUNTED SWITCH TO CONTROL MOTORIZED PROJECTION SCREENS.</p> <p>Ⓛ MOTOR RATED SWITCH WITH THERMAL OVERLOADS</p> <p>Ⓛ MOTOR RATED TOGGLE SWITCH</p> <p>Ⓛ CEILING MOUNTED OCCUPANCY SENSOR</p>				

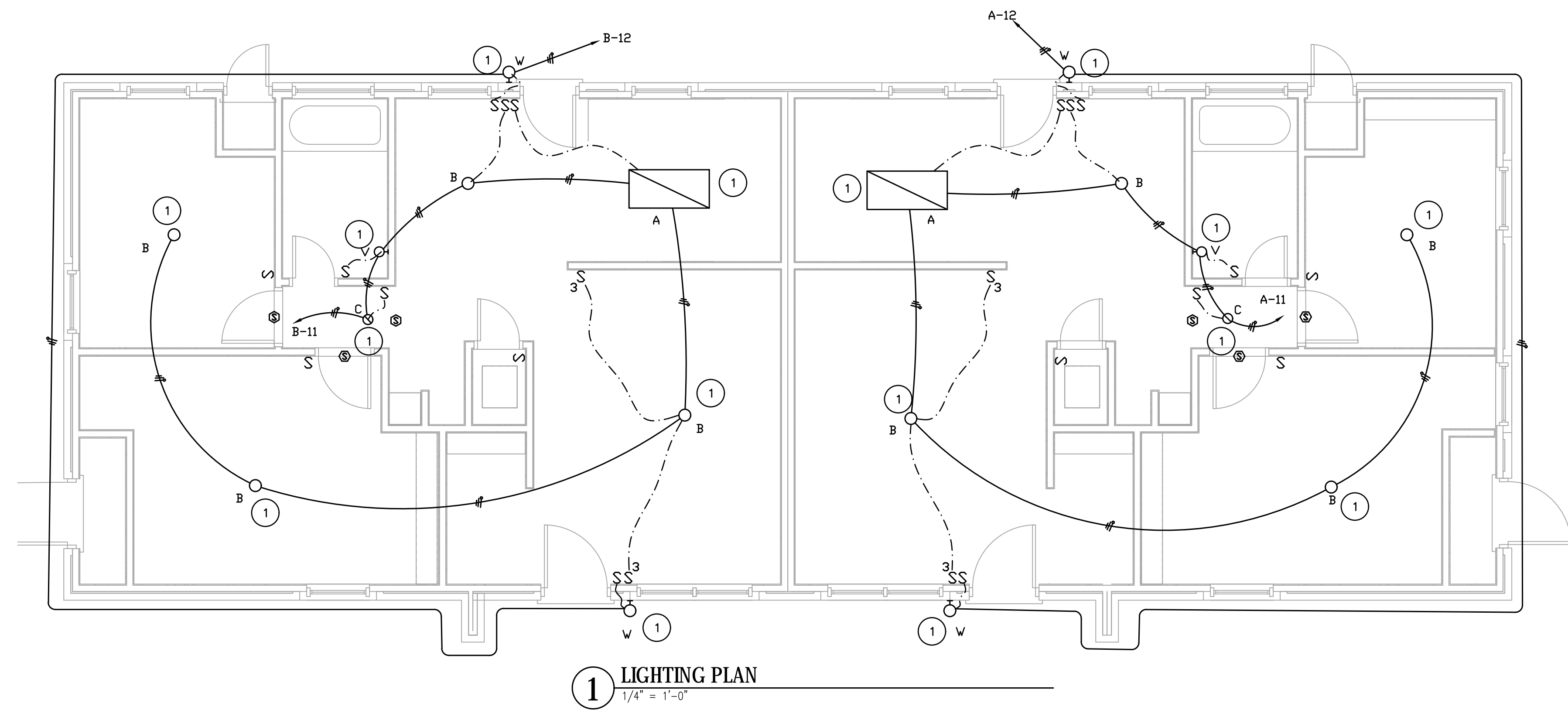
**General Notes Lighting Sheets:
 (Applies to all Lighting Sheets)**

- A. WHEN LIGHTING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF. COORDINATE SWITCH LOCATIONS IN ROOMS WITH ARCHITECT AND OTHER DEVICES (THERMOSTATS, FIRE ALARM, AND CALL BUTTONS).
- B. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT. MAXIMUM FIXTURE WHIP LENGTH FROM ANY J-BOX 6 FEET. LIGHTING CIRCUITS JOINTS SHALL BE MADE UP IN OVERHEAD J-BOXES SECURED TO STRUCTURE WITH LIGHTING WHIPS FROM THE J-BOXES. FIXTURES DESIGNED TO BE QUICK-CLIPPED TOGETHER SHALL BE CONNECTED AS PER MANUFACTURER.
- C. COORDINATE LIGHT LOCATIONS WITH OTHER CEILING ITEMS OR JOIST ITEMS PRIOR TO INSTALLATION. LIGHT LOCATIONS TAKE PRECEDENCE OVER AIR DEVICES.
- D. PROVIDE SECONDARY SUPPORT WIRES FROM ALL FOUR (4) CORNERS OF THE LAY-IN FIXTURES TO THE STRUCTURE ABOVE. DO NOT SUPPORT FIXTURES FROM CEILING GRID WIRE SUPPORTS, PIPING, CONDUIT, SIDE WALLS, OR MECHANICAL EQUIPMENT. CEILING SPECIFICATIONS DO NOT SUPERCEDE THIS REQUIREMENT.
- E. PROVIDE INTEGRAL BATTERY BACK-UP W/INTEGRAL BATTERY BACK-UP & TEST SWITCH FOR ALL FIXTURES WITH AN "E" SUFFIX.
- F. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET ROCK AND REPAIR. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.
- G. CONTRACTOR TO VERIFY FIXTURE VOLTAGE PRIOR TO INSTALLING ANY RELOCATED FIXTURE. COORDINATE WITH RCP FOR FIXTURE LOCATIONS.
- H. ALL ROOMS AND HALLWAYS SHALL HAVE SWITCHES WHETHER SHOWN ON PLAN OR NOT. ALL SPACES WITH MORE THAN ONE FIXTURE SHALL HAVE DUAL SWITCHING UNLESS OTHERWISE NOTED. ALL HALLWAYS SHALL HAVE AT LEAST (2) 3-WAY SWITCHES.

REVISED ISSUE DATES:

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_____	▲

- Keyed Notes:**
- ① COORDINATE WITH OWNER FOR FIXTURE SELECTIONS. TYPICAL OF ALL FIXTURES.



AN APARTMENT RESTORATION
 T L SHALEY APARTMENTS
 4827 PETTUS
 SAN ANTONIO, TEXAS, 78228



04/10/18

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HM3
ENGINEERING
 CONSULTANTS

2902 NORTH FLORES
 SAN ANTONIO, TEXAS 78212
 210.393.1840 PHONE
 SAN ANTONIO - RGV
 TPBE FIRM REGISTRATION NO. 13361

PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH

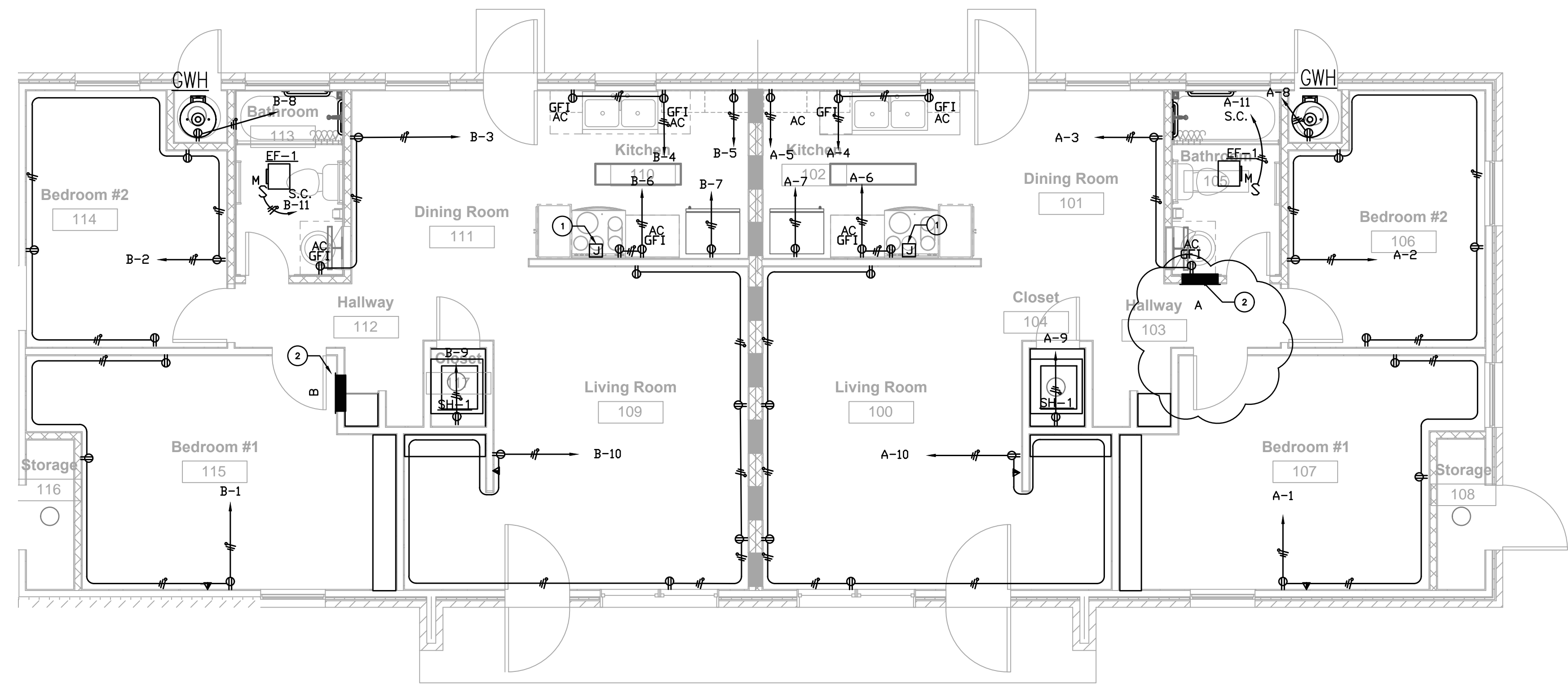
LIGHTING PLAN
E2.0

**General Notes Power Sheets:
 (Applies to all Power Sheets)**

- A. SEE ALL OTHER PLANS FOR ADDITIONAL DEVICES. SOME POWER CIRCUITING MAY BE ON OTHER PLANS. COORDINATE THE LOCATIONS OF DATA/CATV JACKS WITH THE RECEPTACLES. MOUNT ADJACENT TO EACH OTHER.
- B. WHEN LOCATING SYSTEMS NEXT TO DOORS, LOCATE 8 INCHES OFF DOOR JAMB TO CENTER OF DEVICE. WHEN MULTIPLE DEVICES ARE TOGETHER, STACK BUT NO MORE THAN 72 INCHES AFF.
- C. MINIMUM CIRCUIT SIZE IS 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT FOR INDIVIDUAL CIRCUITS, 3/4" CONDUIT FOR MULTIPLE CIRCUITS. ALL CONDUCTORS SHALL BE 75 DEGREE (MINIMUM) COPPER THHN, COLOR CODED AS PER NEC AND LOCAL AMENDMENTS WITH SIZE, TEMPERATURE, AND VOLTAGE PERMANENTLY PRINTED ON THE JACKET. ALL JOINTS SHALL BE MADE UP USING SELF LOCKING, TWIST-ON, COLOR CODED, SQUARE WIRE SPRING GRAB, LONG SKIRT, WIRE CONNECTORS WITH SWEPT WINGS.
- D. PROVIDE #10 AWG MIN NEUTRAL FOR ALL MULTIWIRE BRANCH CIRCUITS AND PROVIDE HANDLE TIES FOR CIRCUIT BREAKERS AS REQUIRED BY NEC 210.4.
- E. CONDUCTOR SIZES INDICATED ASSUME NO MORE THAN (3) SINGLE POLE BRANCH CIRCUITS IN EACH CONDUIT. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DE-RATE CONDUCTORS PER NEC TABLE 310.15(B)(2)(a) FOR CONDUITS WITH MORE THAN (3) CURRENT "CARRYING CONDUCTORS".
- F. REFER TO VOLTAGE DROP FEEDER SCHEDULE FOR BRANCH CIRCUITS EXCEEDING 100' IN LENGTH.
- G. COORDINATE RECEPTACLE LOCATIONS WITH MILLWORK AND COUNTERS. DO NOT LOCATE RECEPTACLES BEHIND DRAWERS OR HIDDEN IN MILLWORK UNLESS SPECIFICALLY DIRECTED BY OWNER/ARCHITECT. REVIEW ARCHITECTURAL ELEVATIONS PRIOR TO RECEPTACLE ROUGH-INS. SEE ARCH. ELEVATIONS IN BREAKROOMS FOR APPLIANCES AND RECEPTACLE MOUNTING LOCATIONS.
- H. MOUNT RECEPTACLES 18" AFF, 6" ABOVE BACKSPLASH AT COUNTERS, 48" IN TOILET ROOMS, AT EQUIPMENT ROUGH-IN LOCATIONS FOR APPLIANCES, AND 96" FOR TV'S. PROVIDE GFI RECEPTACLES AT/LOCATED ALL SINKS, ROOFTOP RECEPTACLES, KITCHEN RECEPTACLES, BATHROOM/TOLT ROOMS, EXTERIOR RECEPTACLES, AND UNDERCOUNTER EQUIPMENT. ALSO, ALL RECEPTACLES SERVING DRINKING FOUNTAINS SHALL HAVE GFI. COORDINATE WITH MILLWORK CONTRACTOR FOR MOUNTING OF DEVICES IN BACKSPLASH.
- M. ALL RECEPTACLES NOT DEDICATED TO EQUIPMENT WITHIN 6' OF SINK, MOP SINK, DRINKING FOUNTAIN OR OTHER USER WATER SOURCE SHALL BE GFI PROTECTED.
- N. ALL RECEPTACLES IN KITCHENS SHALL BE GFI PROTECTED.
- O. ALL EQUIPMENT SHALL HAVE A LOCAL DISCONNECTING MEANS, EITHER CORDED PLUG AND RECEPTACLE OR SWITCHED DISCONNECT. VERIFY FROM EQUIPMENT SUBMITTED OR RELOCATED IF DIRECT CONNECT OR RECEPTACLE. IF DIRECT CONNECT, PROVIDE SWITCH AS PER NEC OTHERWISE, PROVIDE RECEPTACLE, CORD PLUG AS REQUIRED BY EQUIPMENT SUBMITTAL.
- P. FIRESTOP ALL CONDUIT PENETRATIONS IN RATED WALLS. SEE ARCHITECTURAL FOR WALL RATINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO SHEET ROCK AND REPAIR.
- Q. PROVIDE FIRE RATED SLEEVES IN ALL FLOOR PENETRATIONS.
- R. PROVIDE A MINIMUM OF (10) SPARE 20A/1P BREAKERS AND (3) 20A/1P SPACES IN EACH PANEL WHETHER SHOWN ON SCHEDULE OR NOT.

REVISED ISSUE DATES:

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_____	▲
_____	▲
_____	▲



1 POWER PLAN
 1/4" = 1'-0"

Keyed Notes:

- 1) PROVIDE JBOX FOR CONNECTION TO EXHAUST VENT HOOD. CONNECT TO 20A/1P SPARE IN UNIT PANEL.
- 2) APPROXIMATE NEW PANEL LOCATION. VERIFY LOCATION WITH OWNER PRIOR TO ROUGH-IN.

AN APARTMENT RESTORATION
T L SHALEY APARTMENTS
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04/10/18

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HM3
ENGINEERING
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2982 NORTH FLORES
 SAN ANTONIO, TEXAS 78212
 210.393.1840 PHONE
 SAN ANTONIO - RGV
 TBPB FIRM REGISTRATION NO. 13361

PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH

POWER PLAN
E3.0

PANEL A

VOLTAGE (L-N):	120	ENCLOSURE TYPE:	NEMA 1
VOLTAGE (L-L):	240	MOUNTING:	SURFACE
PHASES, WIRES:	1 ϕ , 3 W	AIC RATING:	10000
MINIMUM BUS CAPACITY (A):	60 A	NOTES:	----
MAIN O.C. DEVICE (A):	60 A		

CKT NO	DESCRIPTION	TRIP AMPS	POLE	PHASE LOADS (VA)				POLE	TRIP AMPS	DESCRIPTION	CKT NO
				A	B						
1	RECEPTACLES	20	1	540	720			1	20	RECEPTACLES	2
3	RECEPTACLES	20	1			360	360	1	20	RECEPTACLES	4
5	WASHER	20	1	180	360			1	20	RECEPTACLES	6
7	REFRIGERATOR	20	1			180	180	1	20	GW	8
9	SPACE HEATER	20	1	756	900			1	20	RECEPTACLES	10
11	LIGHTING	20	1			436	64	1	20	LIGHTING EXTERIOR	12
13	SPARE	20	1	0	0			1	20	SPARE	14
15	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	16
17	SPACE ONLY	----	----	0	0			----	----	SPACE ONLY	18
19	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	20
21	SPACE ONLY	----	----	0	0			----	----	SPACE ONLY	22
23	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	24
				CONNECTED LOAD PHASE TOTALS (VA)							
				3456		1580					

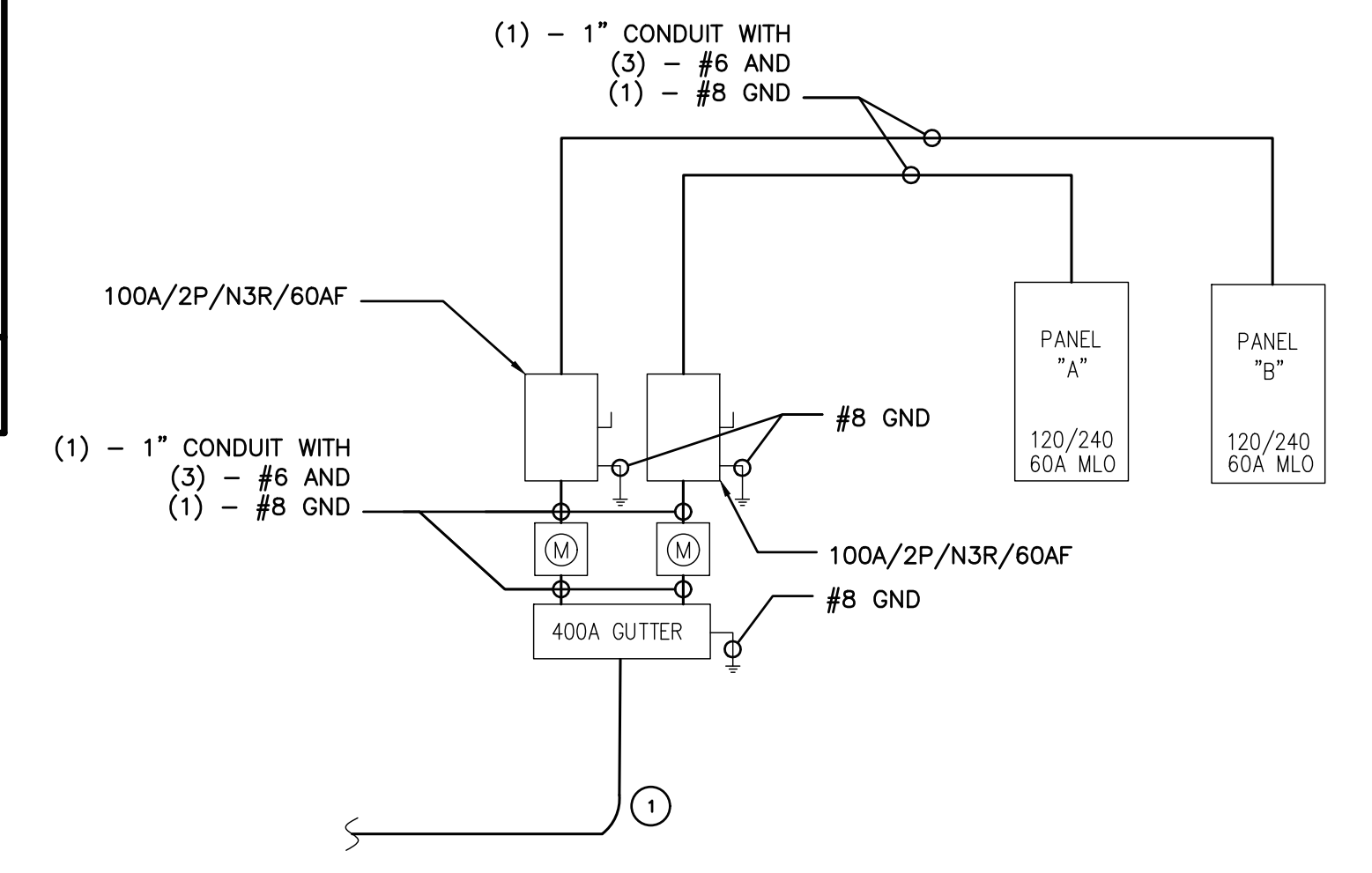
CONNECTED LOAD (KVA)	4.4	DEMAND FACTOR	1.00	DEMAND LOAD (KVA)	4.4	DEMAND LOAD SPARE CAPACITY	5.2 KVA
Heating	0.2		1.00		0.2	SPARE CAPACITY	9.2 KVA
Lighting	0.3		1.25		0.4	SPARE CAPACITY	38.5 AMPS
Motors	0.0		1.00		0.0	SPARE CAPACITY	64 %
Motors (Largest)	0.2		1.25		0.2		
TOTAL:	5.0			5.2			
LOAD (AMPS):	21.0			21.5			

PANEL B

VOLTAGE (L-N):	120	ENCLOSURE TYPE:	NEMA 1
VOLTAGE (L-L):	240	MOUNTING:	SURFACE
PHASES, WIRES:	1 ϕ , 3 W	AIC RATING:	10000
MINIMUM BUS CAPACITY (A):	60 A	NOTES:	----
MAIN O.C. DEVICE (A):	60 A		

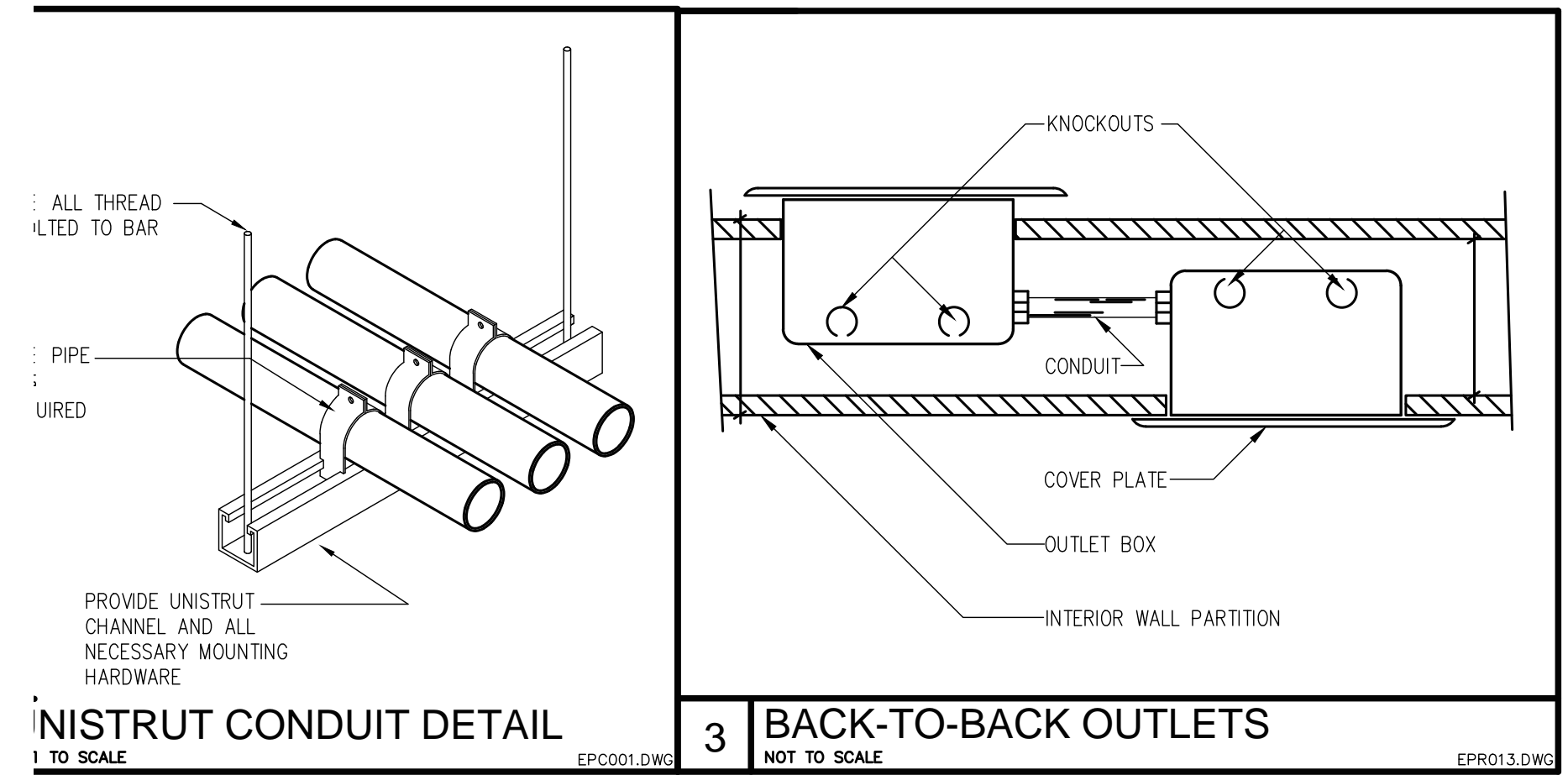
CKT NO	DESCRIPTION	TRIP AMPS	POLE	PHASE LOADS (VA)				POLE	TRIP AMPS	DESCRIPTION	CKT NO
				A	B						
1	RECEPTACLES	20	1	540	720			1	20	RECEPTACLES	2
3	RECEPTACLES	20	1			360	360	1	20	RECEPTACLES	4
5	WASHER	20	1	180	360			1	20	RECEPTACLES	6
7	REFRIGERATOR	20	1			180	180	1	20	GW	8
9	SPACE HEATER	20	1	756	900			1	20	RECEPTACLES	10
11	LIGHTING	20	1			436	64	1	20	EXTERIOR LIGHTING	12
13	SPARE	20	1	0	0			1	20	SPARE	14
15	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	16
17	SPACE ONLY	----	----	0	0			----	----	SPACE ONLY	18
19	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	20
21	SPACE ONLY	----	----	0	0			----	----	SPACE ONLY	22
23	SPACE ONLY	----	----			0	0	----	----	SPACE ONLY	24
				CONNECTED LOAD PHASE TOTALS (VA)							
				3456		1580					

CONNECTED LOAD (KVA)	4.4	DEMAND FACTOR	1.00	DEMAND LOAD (KVA)	4.4	DEMAND LOAD SPARE CAPACITY	5.2 KVA
Heating	0.2		1.00		0.2	SPARE CAPACITY	9.2 KVA
Lighting	0.3		1.25		0.4	SPARE CAPACITY	38.5 AMPS
Motors	0.0		1.00		0.0	SPARE CAPACITY	64 %
Motors (Largest)	0.2		1.25		0.2		
TOTAL:	5.0			5.2			
LOAD (AMPS):	21.0			21.5			

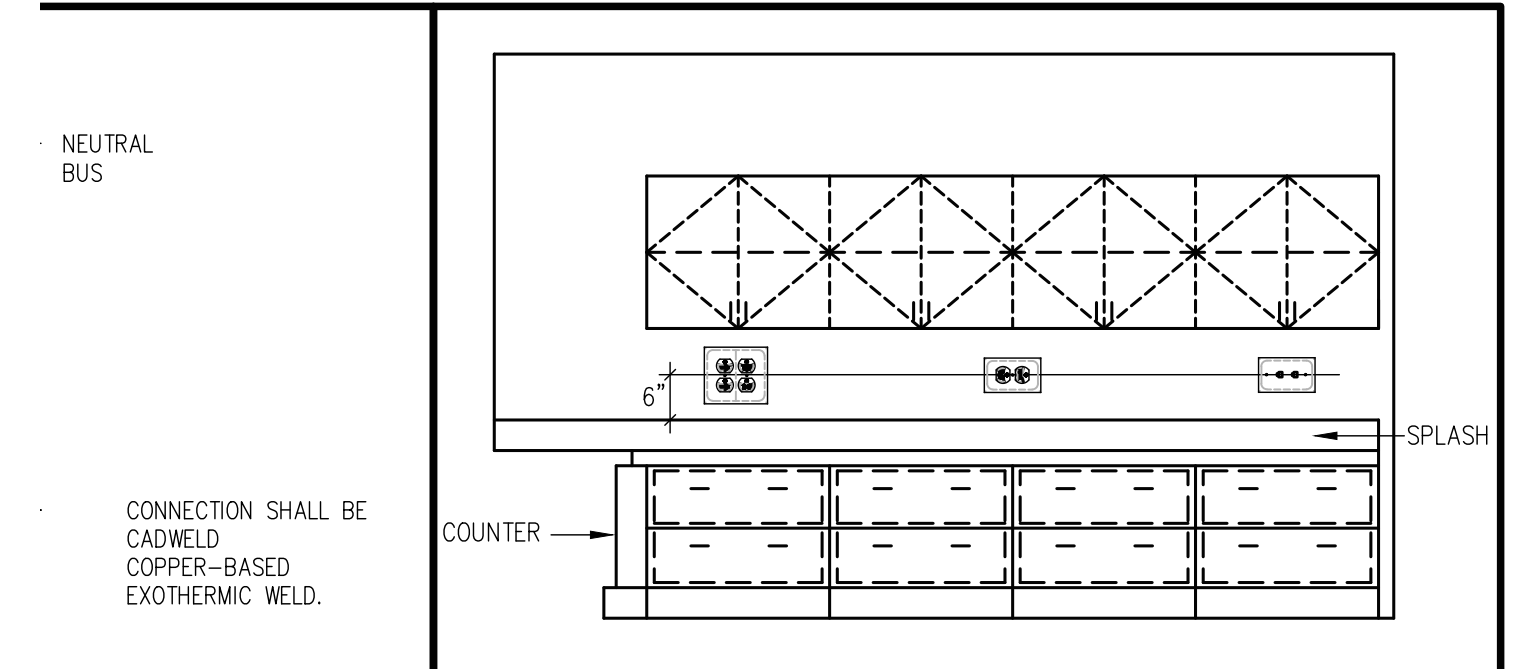


1 PARTIAL ONE LINE DIAGRAM
 N.T.S.

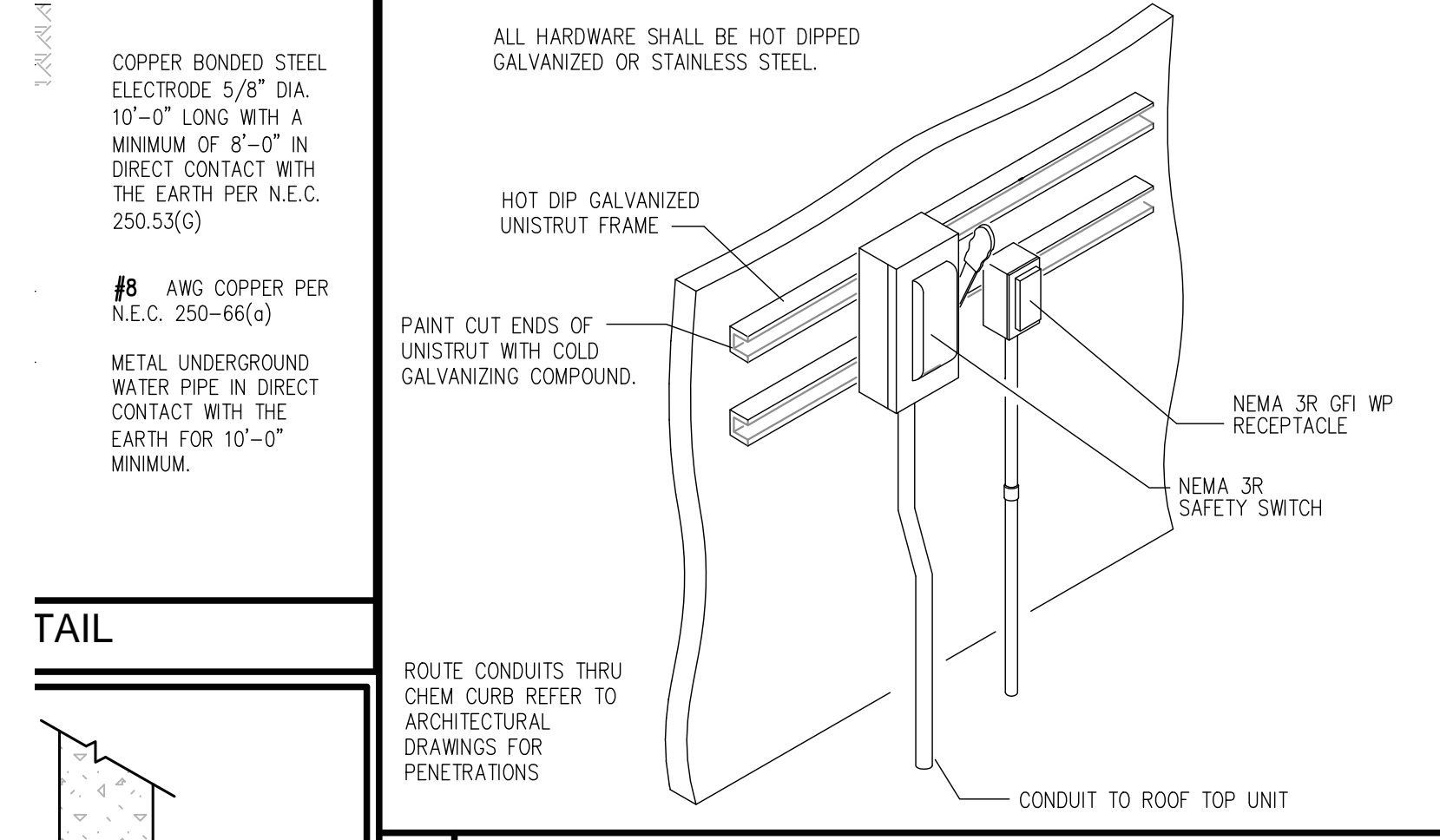
Keyed Notes:
 1 FIELD VERIFY EXTENT OF DAMAGE TO FEEDERS AND FEEDER CONDUIT. CUT AT FURTHEST POINT OF DAMAGE, SPLICE AND EXTEND TO NEW 400A GUTTER. MATCH EXISTING FEEDER AND CONDUIT SIZE.



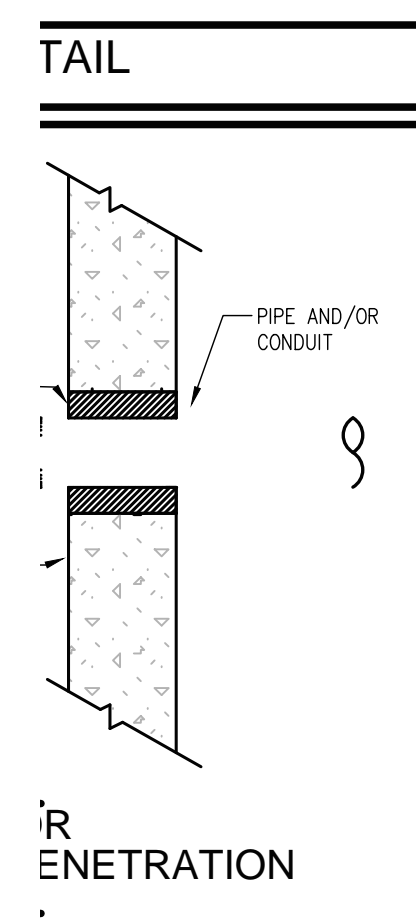
3 UNISTRUT CONDUIT DETAIL NOT TO SCALE
3 BACK-TO-BACK OUTLETS NOT TO SCALE



5 TYPICAL COUNTERTOP DEVICE ELEVATION
 NOT TO SCALE



7 EXTERIOR WALL DISCONNECT DETAIL
 NOT TO SCALE



TAIL
AIR PENETRATION

NEUTRAL BUS
 CONNECTION SHALL BE CADWELDED COPPER-BASED EXOTHERMIC WELD.
 METAL FRAME OF BLDG.
 FINISHED GRADE
 COPPER BONDED STEEL ELECTRODE 5/8" DIA. 10'-0" LONG WITH A MINIMUM OF 8'-0" IN DIRECT CONTACT WITH THE EARTH PER N.E.C. 250.53(G)
 #8 AWG COPPER PER N.E.C. 250-66(G)
 METAL UNDERGROUND WATER PIPE IN DIRECT CONTACT WITH THE EARTH FOR 10'-0" MINIMUM.
 ROUTE CONDUITS THRU CHEM CURB REFER TO ARCHITECTURAL DRAWINGS FOR PENETRATIONS
 CONDUIT TO ROOF TOP UNIT

ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED OR STAINLESS STEEL.
 HOT DIP GALVANIZED UNISTRUT FRAME
 PAINT CUT ENDS OF UNISTRUT WITH COLD GALVANIZING COMPOUND.
 NEMA 3R GF1 WP RECEPTACLE
 NEMA 3R SAFETY SWITCH

ABBREVIATIONS

IBV	ABOVE
IC	ALTERNATING CURRENT / ABOVE CEILING
ICMPR	AIR COMPRESSOR
ICU	AIR CONDITIONING UNIT
IFF	ABOVE FINISHED FLOOR
IFMS	AIR FLOW MEASURING STATION
IHU	AIR HANDLING UNIT
IMB	AMBIENT
IMP	AMPERE
INSI	"AMERICAN NATIONAL STANDARDS INSTITUTE"
IAPPROX.	APPROXIMATE
IRI	AMERICAN REFRIGERATION INSTITUTE
ISHRAE	"AMERICAN SOCIETY OF HEATING, REFRIGERATION, and AIR CONDITIONING ENGINEERS"
ISME	"AMERICAN SOCIETY OF MECHANICAL ENGINEERS"
ISPE	"AMERICAN SOCIETY OF PLUMBING ENGINEERS"
ISTM	"AMERICAN SOCIETY FOR TESTING AND MATERIALS"
IVG	AVERAGE
IWWA	"AMERICAN WATER WORKS ASSOCIATION"
B	BOILER
BARO	BAROMETRIC
BAROPR	BAROMETRIC PRESSURE
BF	BELOW FLOOR
BFC	BELOW FINISHED CEILING
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BOD	BOTTOM OF DUCT
BOM	BILL OF MATERIAL
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
CCL	COOLING COIL
CCW	COUNTERCLOCKWISE
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CHP	CHILLER WATER PUMP
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CLR	CLOSED CIRCUIT COOLER
CMPR	COMPRESSOR
CR	CONDENSATE RETURN
CRU	COMPUTER ROOM UNIT
CT	COOLING TOWER
CU	CONDENSING UNIT
CU.FT.	CUBIC FEET
CU.IN.	CUBIC INCH
CV	CONSTANT VOLUME
CO2	CARBON DIOXIDE SENSOR
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
dB	DECIBEL
I	DRAIN
IBT	DRY BULB TEMPERATURE
IC	DIRECT CURRENT
IDC	DIRECT DIGITAL CONTROL
IEG	DEGREE
IENS	DENSITY
IA	DIAMETER
IFF	DIFFERENCE or DELTA
IN	DOWN
IP	DEEP
IPT	DEW POINT TEMPERATURE
/A	EXHAUST AIR
A	EACH
AT	ENTERING AIR TEMPERATURE
DH	ELECTRIC DUCT HEATER
F	EXHAUST FAN
FF	EFFICIENCY
NT.H.	ENTHALPY
OD	EMERGENCY OVERFLOW DRAIN
T	EXPANSION TANK
VP	EVAPORATIVE COOLER
WT	ENTERING WATER TEMPERATURE
XP	EXPANSION
:	FAHRENHEIT
CU	FAN COIL UNIT
LR	FLOOR
OB	FLAT ON BOTTOM
OT	FLAT ON TOP
PM	FEET PER MINUTE
PS	FEET PER SECOND
PTU	FAN POWERED TERMINAL UNIT
RN	FURNACE
T	FEET
T.W.G.	FEET of WATER GAGE
VEL	FACE VELOCITY
GAL	GALLONS
PH	GALLONS PER HOUR
SPM	GALLONS PER MINUTE
GR	GRAINS
ICL	HEATING COIL
ID	HOOD
IGT	HEIGHT
IP	HORSEPOWER
IPS	HIGH PRESSURE STEAM
IR	HOUR
IUM	HUMIDIFIER
IWP	HOT WATER PUMP
IWR	HOT WATER RETURN
IWS	HOT WATER SUPPLY
IZ	HERTZ
D	INSIDE DIAMETER
H	INTAKE HOOD
IN	INCH
N.W.G.	INCHES of WATER GAGE
RH	INFRARED HEATER

ABBREVIATIONS

K	KITCHEN HOOD EXHAUST
KHE	KILOWATTS
KW	KILOWATT HOUR
L	L
L-#	LOUVER DESIGNATION
LAT	LEAVING AIR TEMPERATURE
LBS.	POUNDS
LIO	LIQUID
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
M	MAKEUP AIR
MA	MAXIMUM
MAX.	THOUSAND BTU/HR.
MBH	MINIMUM CIRCUT AMPACITY
MCA	THOUSAND CUBIC FEET
MCF	MINIMUM or MINUTES
MIN.	MAXIMUM OVERCURRENT PROTECTION
MOCPP	MEDIUM PRESSURE STEAM
MPS	"MANUFACTURERS' STANDARDIZATION SOCIETY of the Valves and Fittings Industry, Inc."
MSS	
N	NOT APPLICABLE
N/A	NOISE CRITERIA
NC	NORMALLY CLOSED
N.C.	NATIONAL ENVIRONMENTAL BALANCING BUREAU
NEBB	NOT IN CONTRACT
N.I.C.	NORMALLY OPEN
N.O.	NOT TO SCALE
N.T.S.	
O	OUTSIDE AIR
O/A	OUTSIDE DIAMETER
OD	OCCUPATIONAL SAFETY and HEALTH ADMINISTRATION
OSHA	OUNCE
OZ	
P	PRESSURE DIFFERENCE
PD	PHASE
PH	PART PER MILLION
PPM	PRIMARY
PRI	PRESSURE
PRESS.	POUNDS PER SQUARE INCH
PSI	"PSI, ABSOLUTE"
PSIA	"PSI, GAGE"
PSIG	
Q	
R	THERMAL RESISTANCE
R	REFRIGERANT-22
R-22	RETURN AIR
R/A	RECEIVER
RCVR	ROOF DRAIN
RD	RE: 1/M-xx "REFER TO DETAIL NO.1, SHEET M-xx"
RE	RECIRCULATE
RECIRC.	RETURN FAN
RF	RELIEF HOOD
RH	REFRIGERANT LIQUID
RL	REVOLUTIONS PER MINUTE
RPM	REVOLUTIONS PER SECOND
RPS	REFRIGERANT SUCTION
RS	ROOFTOP UNIT
RTU	RELIEF VENT
RV	
S	SECOND
s	SOUND ATTENUATOR
SA	SUPPLY AIR
S/A	SATURATION
SAT	SMOKE DETECTOR
SD	SUPPLY FAN
SF	SPACE HEATER DESIGNATION
SH-#	SPECIFIC GRAVITY
SG	"SHEET METAL and AIR CONDITIONING"
SMACNA	"CONTRACTORS' NATIONAL ASSOCIATION"
	STATIC PRESSURE
SP	SPECIFICATION
SPEC.	SQ.FT.
SO.FT.	SQUARE FEET
SUCT.	SUCTION
T	TEMPERATURE DIFFERENCE
TD	TEMPERATURE
TEMP	TONS OF REFRIGERATION
TONS	THERMOSTAT
TSTAT	TERMINAL UNIT
TU	
U	HEAT TRANSFER COEFFICIENT
U	UNDER COUNTER
U/C	UNDERGROUND
UG	UNIT HEATER
UH	UNLESS NOTED OTHERWISE
U.N.O.	UNIT VENTILATOR
UV	
V	VOLTS
VA	VOLT AMPERE
VAC	VACUUM
VAR	VARIABLE
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VEL.	VENTILATION
VENT.	VERTICAL
VERT.	VARIABLE FREQUENCY DRIVE
VFD	VOLUME
VOL.	VELOCITY PRESSURE
VOL.	VENT THRU ROOF
VTR	
W	WITH
W/	WITHOUT
W/O	WATTS
W	WET BULB
WB	WET BULB TEMPERATURE
WBT	WEIGHT
WT	
X	
Y	YARD CLEANOUT
YCO	YARD
YD	YEAR
YR	
Z	ZONE
ZN	

GENERAL MECHANICAL NOTES AND SPECIFICATIONS:

GENERAL

- COORDINATE WORK AMONG ALL DISCIPLINES. IT IS NOT THE INTENT OF THESE DOCUMENTS TO DICTATE WHO MUST DO THE WORK. ALL WORK SHOWN IS THE RESPONSIBILITY OF THE (PRIME) CONTRACTOR.
- FIELD VERIFY ALL CONDITIONS AND MEASURE DIMENSIONS WITHIN THE BUILDING PRIOR TO ORDERING EQUIPMENT AND/OR PROCEEDING WITH INSTALLATION.
- ALL EQUIPMENT SHALL BE FACTORY TESTED, AND CONTRACTOR SHALL VERIFY THEIR CONDITION PRIOR TO INSTALLATION. CONTRACTOR IS RESPONSIBLE FOR EQUIPMENT DAMAGED DURING MOVING AND INSTALLATION.
- EQUIPMENT FOUND DEFECTIVE PRIOR TO FINAL ACCEPTANCE SHALL BE REPLACED AT NO COST TO OWNER.
- SUBMISSION OF BID PROPOSAL IS CONSIDERED AN ACKNOWLEDGEMENT THAT CONTRACTOR VISITED SITE, AND VERIFIED ALL EXISTING CONDITIONS, AND INCLUDED ANY MODIFICATIONS TO EXISTING AND NEW WORK REQUIRED FOR INSTALLATION OF A COMPLETE AND OPERATIONAL MECHANICAL SYSTEM.
- COORDINATE WITH OWNER AND ENGINEER FOR ANY DISRUPTION IN UTILITY SERVICES, PARTICULARLY THOSE THAT MIGHT AFFECT OTHER BUILDINGS IN THE CAMPUS.
- CONTRACTOR SHALL NOT PROCEED WITH ANY WORK INVOLVING A CHANGE IN PROJECT SCOPE OR COST WITHOUT FIRST HAVING OBTAINED ENGINEER'S APPROVAL IN WRITING. UNLESS ENGINEER HAS AGREED TO SUCH CHANGE PRIOR TO IT BEING DONE, AND HAS AGREED THAT AN INCREASE IN COST ASSOCIATED WITH SUCH CHANGE IS WARRANTED; CONTRACTOR WILL NOT BE REIMBURSED FOR SUCH CHANGE.
- TESTING, ADJUSTING AND BALANCING (TAB) CONTRACTOR SHALL BE RETAINED BY THE PRIME CONTRACTOR TAB SHALL NOT BE A PART OF THE MECHANICAL CONTRACT.

CODES AND ORDINANCES

- PERFORM ALL WORK PER LATEST VERSION OF INTERNATIONAL MECHANICAL CODE, AND APPLICABLE LOCAL CODES AND ORDINANCES, UNLESS DRAWINGS OR SPECIFICATIONS HAVE MORE STRINGENT REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND FEES ASSOCIATED WITH PROJECT, INCLUDING FEES FOR INSPECTIONS, APPLICATIONS, AND PROVISION OF NEW SERVICES.
- NOTIFY ENGINEER OF ANY ASPECTS OF DESIGN WHICH ARE THOUGHT TO BE IN NONCOMPLIANCE WITH APPLICABLE CODES.

COORDINATION

- REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR DETAILS OF CONSTRUCTION, INCLUDING BEAMS, FLOOR AND WALL PENETRATIONS, CHASES, AND REFLECTED CEILING PLANS. VERIFY OPENING SIZES WITH EQUIPMENT FURNISHED.
- COORDINATE ALL WORK WITH OTHER TRADES; COORDINATE SCHEDULE OF WORK WITH ALL SUB-CONTRACTORS TO ACHIEVE SMOOTH FLOW OF CONSTRUCTION.
- CONTRACTOR SHALL REVIEW COMPLETE DOCUMENTS PRIOR TO SUBMITTAL OF PROPOSAL TO GAIN COMPLETE UNDERSTANDING OF PROJECT SCOPE, WORK BY OTHERS, AND MECHANICAL WORK ASSOCIATED WITH OTHER DISCIPLINES.
- ENGINEER/ ARCHITECT MUST BE GIVEN AT LEAST A TEN (10) WORKING DAY NOTICE TO PERFORM ALL TYPES OF INSPECTIONS. COORDINATE WORK SCHEDULE WITH ARCHITECT AND ENGINEER TO PLAN ACCORDINGLY FOR APPROPRIATE INSPECTIONS.

ECONOMIZER

- FOR SYSTEMS THAT REQUIRE ECONOMIZER, MECHANICAL CONTRACTOR SHALL PROVIDE A CONTROLLER EQUAL TO HONEYWELL JADE ECONOMIZER MODULE W7220. REFER TO ECONOMIZER DETAIL FOR ADDITIONAL INFORMATION.

METAL AND FLEXIBLE DUCTS

- DRAWINGS ARE DIAGRAMMATIC IN NATURE. FOR CLARITY SAKE, MOST DUCT OFFSETS/RISES/DROPS ARE NOT SHOWN. RECTANGULAR AND ROUND DUCTWORK SHALL BE GALVANIZED STEEL. SIZES SHOWN ARE INSIDE CLEAR DIMENSION.
 - VERIFY BOTTOM OF DUCT ELEVATION AND COORDINATE WITH OTHER TRADES.
 - CONSTRUCT AND LEAKAGE TEST ALL DUCTWORK BASED ON SMACNA REQUIREMENTS. COORDINATE PRESSURE CLASSES WITH EQUIPMENT SCHEDULES.
 - ALL GALVANIZED SHEET METAL DUCT WORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE".
 - USE 2" GLASS FIBER-REINFORCED FABRIC JOINT AND SEAM TAPE. USE WATER BASED JOINT AND SEAM SEALER. USE FIRE RESISTANT SEALER FOR FILLING OPENINGS AROUND DUCT PENETRATIONS THROUGH WALLS. ACCEPTABLE PRODUCTS ARE DOW CORNING, FIRE STOP FOAM AND FIRE STOP SEALER OR EQUAL.
 - USE SHEET METAL SCREWS OR BLIND RIVETS COMPATIBLE WITH DUCT MATERIALS WHEN SECURING ALL DUCTWORK TO STRUCTURE.
 - FLEXIBLE DUCT MAY BE USED TO CONNECT TO SUPPLY DIFFUSERS. MAXIMUM LENGTH OF FLEXIBLE DUCT LIMITED TO 6 FEET. PROVIDE FLEXMASTER TYPE BM UL 181 CLASS I AIR DUCT OR EQUAL. FLEXIBLE DUCT SHALL HAVE MIN. R-8 INSULATING VALUE.
 - FLEXIBLE DUCT CLAMP SHALL BE OF STAINLESS STEEL BANDS WITH CADMIUM PLATED HEX SCREW TO TIGHTEN BAND WITH WORM GEAR ACTION.
 - PROVIDE TURNING VANES IN ALL SPLITS, TEES AND SWEEP 90 DEGREE ANGLE DUCT FITTINGS. MANUFACTURED TURNING VANES TO BE 1-1/2" WIDE, DOUBLE VANE, CURVED BLADES OF GALVANIZED SHEET STEEL SET "N" O.C. ACCEPTABLE MANUFACTURERS ARE DUCTMATE INDUSTRIES, METALFARE, WARD INDUSTRIES OR EQUAL.
 - WHERE RECTANGULAR TEE FITTINGS ARE SHOWN, PROVIDE FITTING WITH ADJUSTABLE DIVIDER SHEET AND TURNING VANES.
 - WHERE RECTANGULAR MAIN AND BRANCH CONNECTIONS ARE SHOWN, PROVIDE EXTRACTOR VANES.
 - PROVIDE MANUAL VOLUME CONTROL DAMPERS WHERE SHOWN ON DRAWINGS. DAMPERS TO HAVE NEOPRENE BLADE SEALS AND GALVANIZED STEEL FRAMES, TIE BARS, DAMPER AND BRACKETS. ACCEPTABLE MANUFACTURERS ARE RUSKIN CO., NAILOR INDUSTRIES, FLEXMASTER OR EQUAL.
 - ABOVE INACCESSIBLE CEILINGS AND WHERE DUCT CONFIGURATION DOES NOT ALLOW FOR INSTALLATION OF DAMPER IN DUCTWORK OR DIFFUSER, PROVIDE REMOTE MANUAL DAMPER BY YOUNG REGULATOR. (BOWEN CABLE CONTROL SYSTEM). CONTRACTOR MAY PROVIDE OPPOSED BLADE DAMPER THAT IS INTEGRAL TO GRID WITH ENGINEER'S APPROVAL.
- INSULATION**
- DUCT WRAP INSULATION SHALL BE MINERAL FIBER INSULATION. ALL SERVICE JACKETING MANUFACTURED FROM KRAFT PAPER, REINFORCING SCRM, ALUMINUM FOIL AND VINYL FILM. ACCEPTABLE MANUFACTURERS ARE CERTANTEED, KNAUF OR OWENS-CORNING. INSTALL DUCT WRAP INSULATION PER MANUFACTURER'S INSTRUCTIONS.
 - INTERIOR DUCTWORK TO BE INSULATED WITH DUCT WRAP INSULATION. ALL SUPPLY DUCTS TO HAVE 3" MIN. THICKNESS (R-8) INSULATION AND ALL RETURN AND OUTSIDE AIR DUCTS TO HAVE 2" MIN. INSULATION.

TESTING, ADJUSTING AND BALANCING (TAB)

- TAB TO BE PERFORMED BY AN INDEPENDENT ENTITY, CERTIFIED BY AMBC OR NEBB.
- PERFORM TESTING AND BALANCING PROCEDURES PER AMBC'S "NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE" OR NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS".



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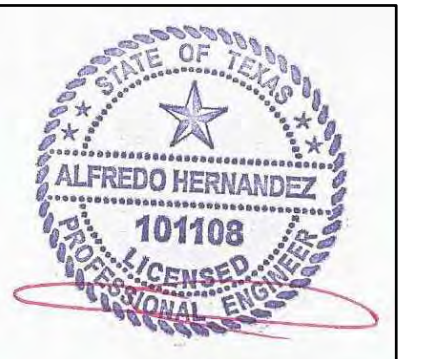
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TEL. 210 308-0080 FAX. 210 697-3309 eMAIL OFFICE@DHRARCHITECTS.COM

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AN APARTMENT RESTORATION
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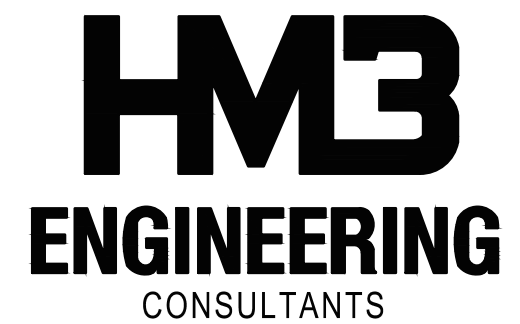
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MECHANICAL SYMBOLS & ABBREVIATIONS

MO.0



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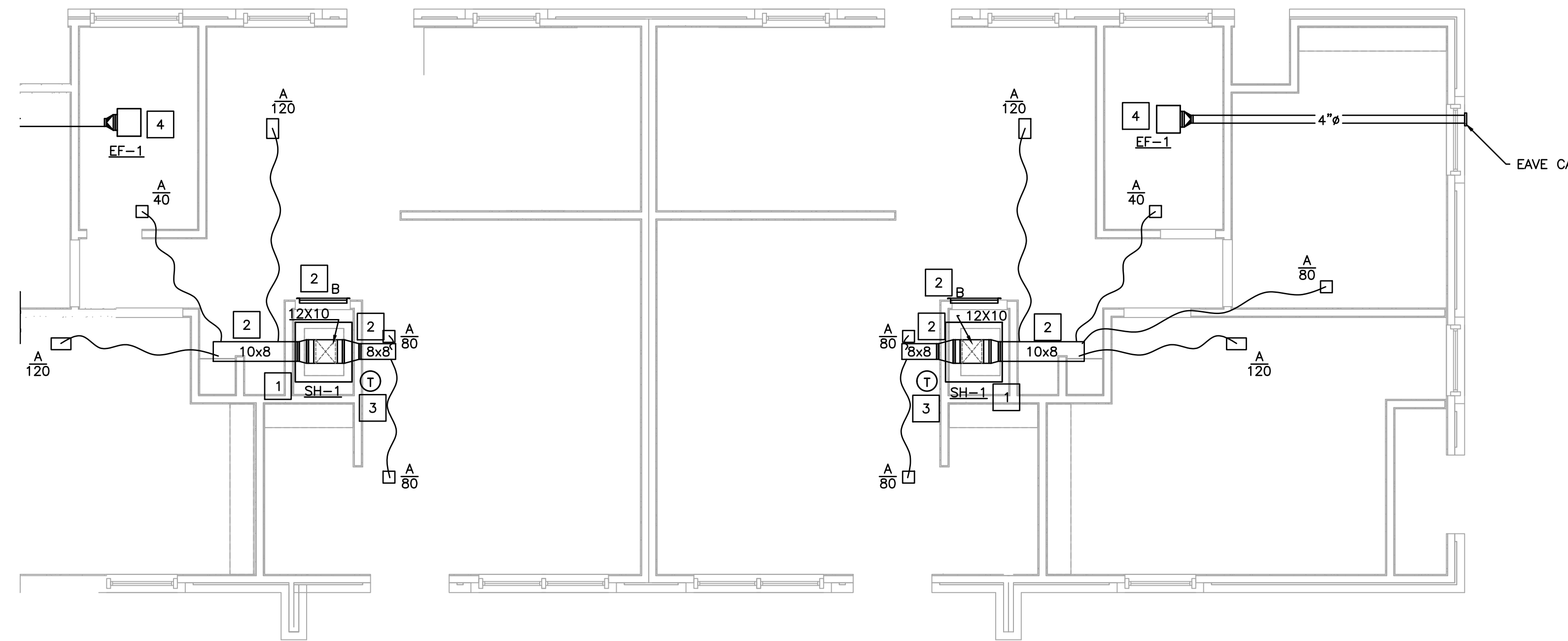
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MECHANICAL GENERAL NOTES:

- EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING, ETC...
- DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
- CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- REFER TO M3.0 FOR DIFFUSERS AND RETURNS GRILLE SIZES.

KEYED NOTES: MECHANICAL

- LOCATE CONCEAL INDOOR UNIT AS SHOWN ON DRAWINGS. VERIFY CLEARANCES. COORDINATE WITH ARCHITECTURE DRAWINGS PRIOR TO INSTALLATION.
- ROUTE SUPPLY AND RETURN DUCT AS SHOWN. TRANSITIONS AS REQUIRED. FIELD ADJUST TO ACCOMMODATE WITH STRUCTURE CLEARANCE.
- MOUNT CONTROL DEVICES ON WALL. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
- INTERLOCK EXHAUST FAN WITH LIGHTING IN THIS ROOM.



1 MECHANICAL PLAN
 1/4" = 1'-0"

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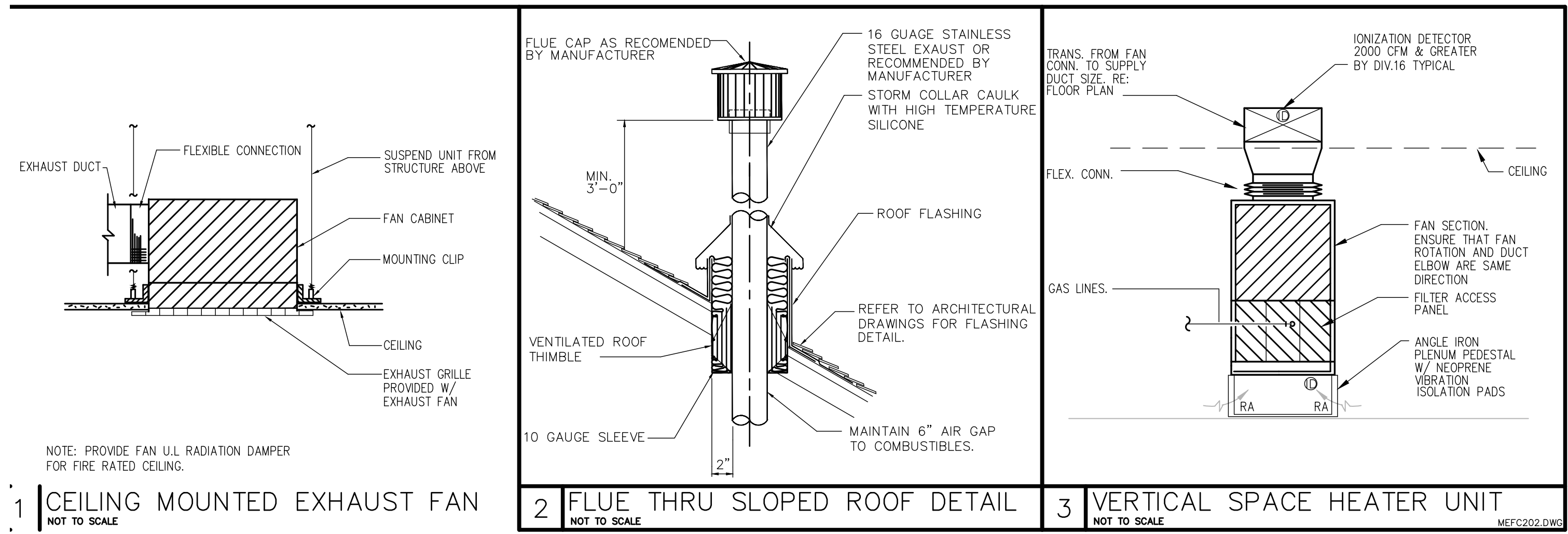
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MECHANICAL
 PLAN
M2.0

REVISED ISSUE DATES:

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AN APARTMENT RESTORATION
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MECHANICAL AIR TERMINAL DEVICES SCHEDULE				
DESCRIPTION	CONSTRUCTION	BASIS OF DESIGN		NOTES
	FINISH	MANUFACTURER	MODEL OR SERIES	
SINGLE DEFLECTION SUPPLY GRILLE	STEEL	KRUEGER	800	ALL
FIXED DEFLECTION RETURN GRILLE, WITH FILTER FRAME	STEEL	KRUEGER	S80	ALL

1. WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.
 2. VISIBLE THROUGH FACE OF RETURN AIR GRILLES FLAT BLACK. THIS SHALL INCLUDE DUCTWORK, AND STRUCTURAL MEMBERS.
 3. MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN.
 4. G. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.
 5. NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
 6. OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.

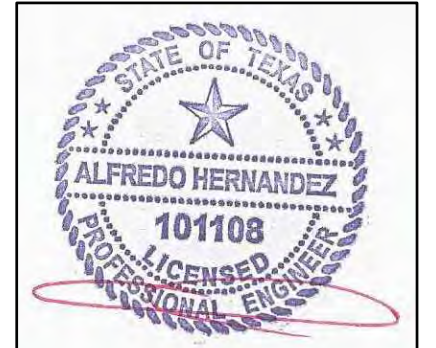
GRILLE:

MECHANICAL EQUIPMENT (GAS HEAT) SCHEDULE											
TAG	FLOW RATE		STATIC PRESSURE		ELECTRICAL DATA		GAS HEATING		BASIS OF DESIGN		NOTES
	SUPPLY	OA	EXTERNAL	MCA	MOCP	VOLTAGE	GAS HEATING	MANUFACTURER	MODEL OR SERIES	HP	
	CFM	CFM	IN WG	AMPS	AMPS	VOLTS	MBH	TRANE	TUD1A040A	1/5	
SH-1	520	-	0.3	6.3	15	115/1Ø	40				1

NOTE: 1. UNIT TO BE PROVIDED WITH GAS HEAT, FAN AND FILTER SECTION.

MECHANICAL FAN SCHEDULE											
TAG	FLOW RATE	STATIC PRESSURE	MOTOR DATA		ELECTRICAL DATA		MAXIMUM	BASIS OF DESIGN		NOTES	
	CFM	EXTERNAL	LOAD	SPEED	MCA	MOCP	LOUDNESS	MANUFACTURER	MODEL OR SERIES		
		IN WG	HP	RPM	AMPS	AMPS	SONES				
EF-1	75	.05	-	-	0.4	15	120	.6	BROAN	X880	1,2

NOTES:
 1. INTERLOCK WITH LIGHTS IN ROOM.
 2. PROVIDE FACTORY MOUNTED AND INSTALLED DISCONNECT.



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 210.393.1840 PHONE
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PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH
MECHANICAL SCHEDULES & DETAILS
M3.0

PLUMBING SYMBOLS AND ABBREVIATIONS

(NOT ALL OF THE SYMBOLS SHOWN MAY BE USED ON THE PROJECT.)

ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	SYMBOL	DESCRIPTION	ABBREVIATION	ABBREVIATIONS	ABBREVIATIONS
SD, RT		OUTSIDE YOLK & STEM GATE VALVE	OSY		UPRIGHT FIRE SPRINKLER HEAD	-	A	MAX
SSD		GATE VALVE	GV		FIRE HOSE RACK	FHR	AFF	MPS
GREASE WASTE		GLOBE VALVE	GLV		AUTOMATIC SPRINKLER PIPE	-	ACU	MTHW
R S, W, SAN, SS		ANGLE VALVE	AV		DRY PIPE SPRINKLER	-	AHU	HG
R S, W, SAN, SS		BALL VALVE	BV		PREACTION SPRINKLER PIPE	-	AHP	MPH
V		BUTTERFLY VALVE	BFV		FIRE HOSE VALVE	FHV	AC	MIN
AW		GAS COCK, GAS STOP	-		FIRE HOSE CABINET (SURFACE-MOUNTED)	FHC	ALT	N
AV		BALANCING VALVE (SPECIFY TYPE)	BLV		FIRE HOSE CABINET (RECESSED)	FHC	ALTI	NC
D		CHECK VALVE	CV		CLEANOUT PLUG	CO	ANSI	NO
PD		PLUG VALVE	PV		FLOOR CLEANOUT	FCO	AWG	NA
CW		ACCESS PANEL LOCATION	AP		WALL CLEANOUT	WCO	AMP	NIC
HW		PLUMBING FIXTURE DESIGNATION	-		YARD CLEANOUT OR CLEANOUT TO GRADE	CO	ANG	NTS
140'		SOLENOID VALVE	-		FLOOR DRAIN WITH P-TRAP	FD	ANGI	NO.
HWR		MOTOR-OPERATED VALVE (SPECIFY TYPE)	-		PITCH DOWN OR UP-IN DIRECTION OF ARROW	-	APP	O
140'R		PRESSURE-REDUCING VALVE	PRV		FLOW-IN DIRECTION OF ARROW	-	A	OZ
TEMP, HW, TW		PRESSURE-RELIEF VALVE	RV		POINT OF CONNECTION	POC	AVG	OA
) TEMP, HWR, TWR		TEMPERATURE-PRESSURE-RELIEF VALVE	TPV		STEAM TRAP (ALL TYPES)	-	B	P
DWS		REDUCED ZONE BACKFLOW PREVENTER	RZBP		FUNNEL FLOOR DRAIN	FDD	BFF	PPM
DWR		DOUBLE-CHECK BACKFLOW PREVENTER	DCBP		FLOOR SINK (3/4 GRATE)	FS	BG	%
SW		HOSE BIBB	HB		FLOOR SINK (1/2 GRATE)	FS	BHP	PH
CD		RECESSED-BOX HOSE BIBB OR WALL HYDRANT	WH		SOIL/VENT STACK DESIGNATION	-	BTU	PIPE
DI		VALVE IN YARD BOX (VALVE TYPE SYMBOL AS REQUIRED FOR VALVE USE)	YB		REFERENCE: DETAIL NUMBER	-	BTU	LB
DE		UNION (SCREW)	-		REFERENCE: SHEET NUMBER	-	BTU	PSF
-		UNION (FLANGED)	-		UPRIGHT SPRINKLER	-	C	PSI
LS		STRAINER (SPECIFY TYPE)	-		PENDENT SPRINKLER	-	C	PSIA
F		PIPE ANCHOR	PA		UPRIGHT SPRINKLER, NIPPLED UP	-	C	PSIG
G		PIPE GUIDE	-		PENDENT SPRINKLER, ON DROP NIPPLE	-	C	PRES
MG		EXPANSION JOINT	EJ		SIDE WALL SPRINKLER	-	C	Q
HG		FLEXIBLE CONNECTOR	FC		PIPE HANGER	-	C	QT
GV		TEE	-		ALARM CHECK VALVE ASSEMBLY	-	C	R
-		SIAMESE FIRE DEPARTMENT CONNECTION	-		DRY PIPE VALVE ASSEMBLY	-	C	R
-		FREESTANDING SIAMESE FIRE DEPARTMENT CONNECTION	-		DELUGE VALVE ASSEMBLY	-	C	R
(1)		WALL (SPECIFY NUMBERS AND SIZE OF OUTLETS)	-		PREACTION VALVE ASSEMBLY	-	C	R
-		FIRE PUMP / JOCKEY PUMP	-		EXISTING FIRE HYDRANT	-	C	R
-		TRAP PRIMER	TP		NEW FIRE HYDRANT	-	C	R
-		PROPANE GAS	PG		WALL HYDRANT, TWO HOSE OUTLETS	-	C	R

GENERAL PLUMBING NOTES:

- ALL WORK SHALL CONFORM TO ALL STATE AND LOCAL CODES, RULES AND REGULATIONS, AND ORDINANCES.
- PLUMBING PLANS ARE DIAGRAMMATIC ONLY. THEY ARE INTENDED TO INDICATE CAPACITY, SIZE, LOCATION, DIRECTION AND GENERAL ARRANGEMENT. WHERE NOT SPECIFICALLY SHOWN ON PLANS, CONTRACTOR SHALL APPLY PROFESSIONAL STANDARDS SUCH AS THAT OF THE AMERICAN SOCIETY OF PLUMBING ENGINEERS.
- WORK SHALL INCLUDE ALL LABOR, MATERIALS, PERMITS AND OTHER COSTS AS ARE NECESSARY FOR THE INSTALLATION OF A COMPLETE AND SATISFACTORY OPERATIONAL PLUMBING AND SANITARY SYSTEM. EQUIPMENT SHALL BE INSTALLED IN SUCH A MANNER AS TO MAINTAIN ITS LISTING AND THE MANUFACTURER'S GUARANTEES AND WARRANTIES.
- THIS CONTRACTOR SHALL COORDINATE WITH THE OTHER TRADES TO INSURE THAT EACH TRADE SHALL HAVE SUFFICIENT SPACE TO INSTALL THEIR EQUIPMENT (DUCTWORK, PIPING, ELECTRICAL, ETC.), ALONG WITH THE PLUMBING WORK.
- WHERE THE TERM "PROVIDE" IS USED, IT SHALL MEAN "FURNISH AND INSTALL". THE CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL THE OTHER TRADES PRIOR TO THE FABRICATION, PURCHASE AND/OR INSTALLATION OF THE WORK.
- UNLESS NOTED, ALL MATERIALS SHALL BE NEW, COMPLETE, INCLUDE MANUFACTURER'S WARRANTY, AND BE U.L. APPROVED IF APPLICABLE. ALL WORK SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.
- FIELD VERIFY ALL DIMENSIONS. CONTRACTOR SHALL VERIFY ELEVATION OF UTILITY CONNECTIONS ON SITE PRIOR TO COMMENCING WORK. FINAL CONNECTION TO SITE UTILITIES SHALL BE BY THE PLUMBING CONTRACTOR.
- PIPING ROUTED THROUGH FOUNDATIONS SHALL BE SLEEVED AND INSTALLED IN ACCORDANCE WITH THE AMERICAN SOCIETY OF PLUMBING ENGINEERS STANDARDS.
- PLUMBING SYSTEM INSTALLER SHALL PROVIDE ALL STRUCTURAL MEMBERS, SUPPORT BRACKETS, FLASHING, HARDWARE, ETC., REQUIRED TO INSTALL A COMPLETE SYSTEM.
- DRAIN WASTE AND VENT PIPING SHALL BE PVC SCH. 40 WHEN INSTALLED BELOW GRADE OR UNDER CONCRETE SLABS. DRAIN WASTE AND VENT PIPING INSTALLED ABOVE GRADE SHALL BE PVC SCH. 40.
- DOMESTIC WATER PIPING SHALL BE TYPE "L" COPPER.
- PLUMBING CONTRACTOR SHALL CERTIFY ALL WATER PIPING AND SPECIALTIES FREE FROM MICROBIAL CONTAMINATION BY SANITIZING THE PLUMBING SYSTEM BEFORE OCCUPATION OF BUILDING.
- EXPOSED FIXTURE TRIM SHALL BE CHROME PLATED BRASS. PROVIDE INDIVIDUAL STOPS FOR EACH HOT AND COLD WATER CONNECTION TO FIXTURES.
- ALL SANITARY PIPING CHANGES OF DIRECTION 45 DEGREES OR MORE SHALL BE ACCOMPLISHED BY USING 45 DEGREE 1/8 BEND ELBOWS UNLESS OTHERWISE NOTED.
- ALL SANITARY PIPING UNDER SLAB SHALL BE 2" OR LARGER.
- INSTALL HEAT TRAPS ON ALL WATER HEATERS, WHERE THE SYSTEM IS NOT RECIRCULATED.
- PROVIDE MAINTENANCE AND/OR OTHER CLEARANCES AT EACH PIECE OF EQUIPMENT AS REQUIRED OR RECOMMENDED BY THE EQUIPMENT MANUFACTURER. COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE ANY ADDITIONAL SPACE REQUIRED FOR SUBMITTED EQUIPMENT.
- PROVIDE ACCESS DOORS IN INACCESSIBLE FINISHES FOR ALL VALVES TRAP PRIMER, ETC., THAT REQUIRES PERIODIC ADJUSTMENTS OR MAINTENANCE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTY AGAINST FIRE THEFT OR ENVIRONMENTAL CONDITIONS.
- ALL MODEL NUMBERS INDICATED ARE PROVIDED TO ESTABLISH THE QUALITY LEVEL AND FEATURES REQUIRED. LISTED MANUFACTURERS AND OTHER PRIOR APPROVED EQUALS MAY BE SUBSTITUTED WHEN PROVIDED WITH EQUAL FEATURES, EITHER STANDARD OR AS ACCESSORIES. SUBSTITUTED AIR DEVICES AND PLUMBING FIXTURES MUST BE SIMILAR IN APPEARANCE TO THE ITEMS SPECIFICALLY INDICATED.
- ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER. CLEAN THE SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE WORK INCLUDED IN THIS CONTRACT.
- PROVIDE 1" ARMAFLEX INSULATION ON ALL HOT AND CIRCULATING WATER PIPING.



DURAND-HOLLIS RUPE ARCHITECTS, INC.
 14603 HUEBNER RD.
 BUILDING 18
 SAN ANTONIO, TEXAS 78230
 TEL. 210 308-0080
 FAX. 210 697-3309
 eMAIL OFFICE@DHRARCHITECTS.COM

REVISED ISSUE DATES:

AN APARTMENT RESTORATION
T L SHALEY APARTMENTS
 4827 PETTUS
 SAN ANTONIO, TEXAS, 78228



04/10/18

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ENGINEERING
 CONSULTANTS

2902 NORTH FLORES
 SAN ANTONIO, TEXAS 78212
 210.393.1840 PHONE

SAN ANTONIO - RGV
 TBPB FIRM REGISTRATION NO. 13361

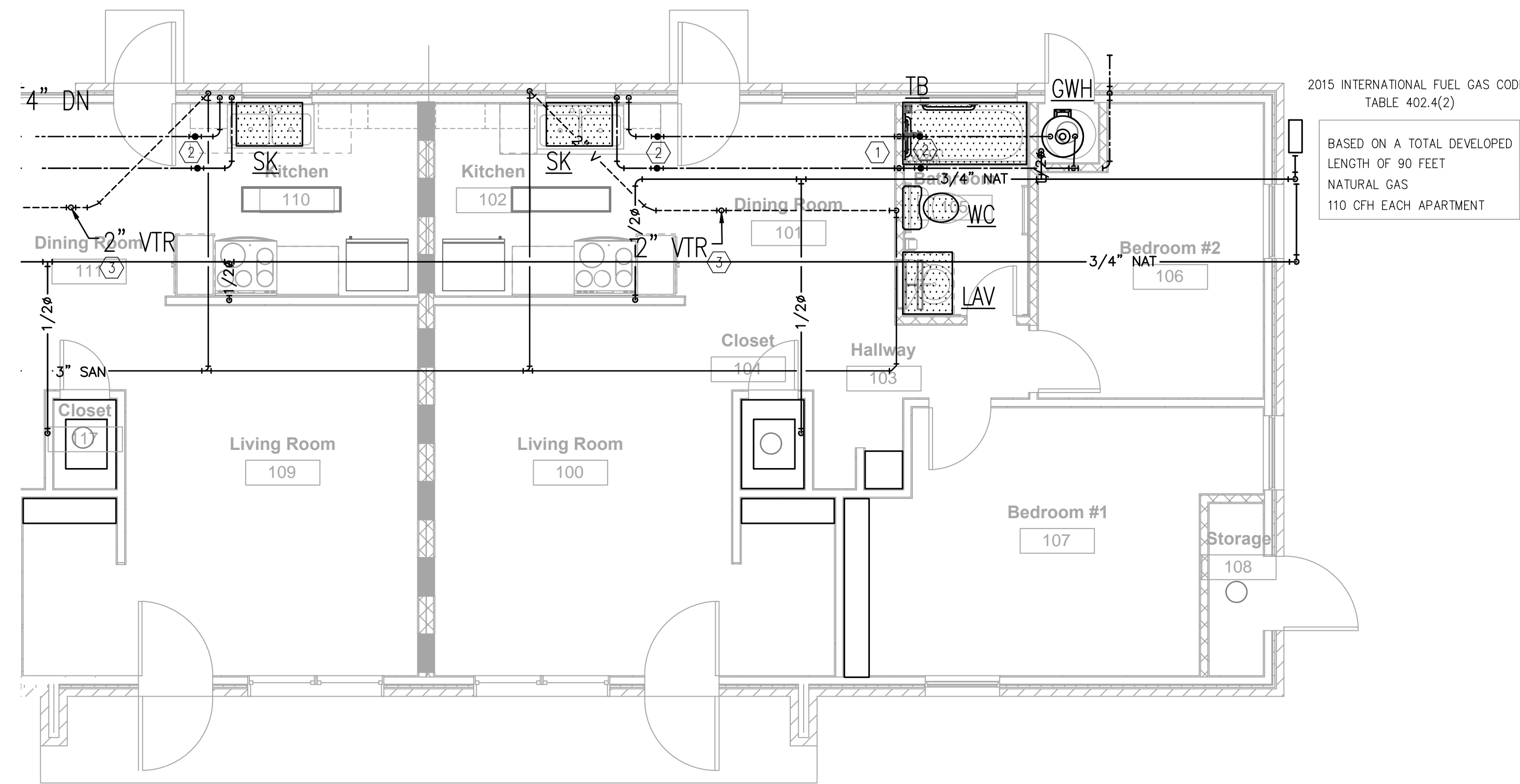
PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH

PLUMBING SYMBOLS & ABBREVIATIONS

P0.0

REVISED ISSUE DATES:

_____	△
_____	△
_____	△
_____	△



PLUMBING GENERAL NOTE:

- CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS TO MAKE THE NECESSARY CHANGES AND MODIFICATION TO NEW AND EXISTING PLUMBING FIXTURE/FIXTURES. REFER TO ARCHITECTURAL DRAWINGS FOR GENERAL DEMOLITION NOTES, DIMENSIONED FLOOR PLANS, MOUNTING HEIGHTS AND SCOPE OF WORK REQUIREMENTS.
- CONTRACTOR PROVIDE NECESSARY MODIFICATION AND/OR EXTEND NEW WATER SUPPLY OR SANITARY WASTE AND VENT (CARRIER) TO NEW PLUMBING FIXTURE AND MAKE ALL FINAL CONNECTIONS.
- DRAWING IS DIAGRAMMATIC ONLY. CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF PIPING, DEVICES AND EQUIPMENT WITH BUILDING ELEMENTS AND THE WORK OF OTHER TRADES.

PLUMBING KEYED NOTES:

- COLD WATER DROP TO FIXTURES. SIZE AS NOTED. SEE PLUMBING RISER DIAGRAMS FOR CONTINUATION IN WALL OR CHASE. PROVIDE WATER HAMMER ARRESTORS AS INDICATED IN RISER DIAGRAMS, PROVIDE ACCESS PANEL WHERE WHA IS LOCATED IN INACCESSIBLE WALL OR CEILING.
- WATER HAMMER ARRESTOR, PROVIDE ACCESS PANEL WHERE LOCATED IN AN INACCESSIBLE WALL/CEILING. PANEL SHALL BE 12"X12" PAINTED TO MATCH WALL/CEILING.
- PROVIDE VTR. REFER TO DETAIL 1/P3.0

1 PLUMBING PLAN
 1/4" = 1'-0"

AN APARTMENT RESTORATION
T L SHALEY APARTMENTS
 4827 PETTUS
 SAN ANTONIO, TEXAS, 78228



04/10/18

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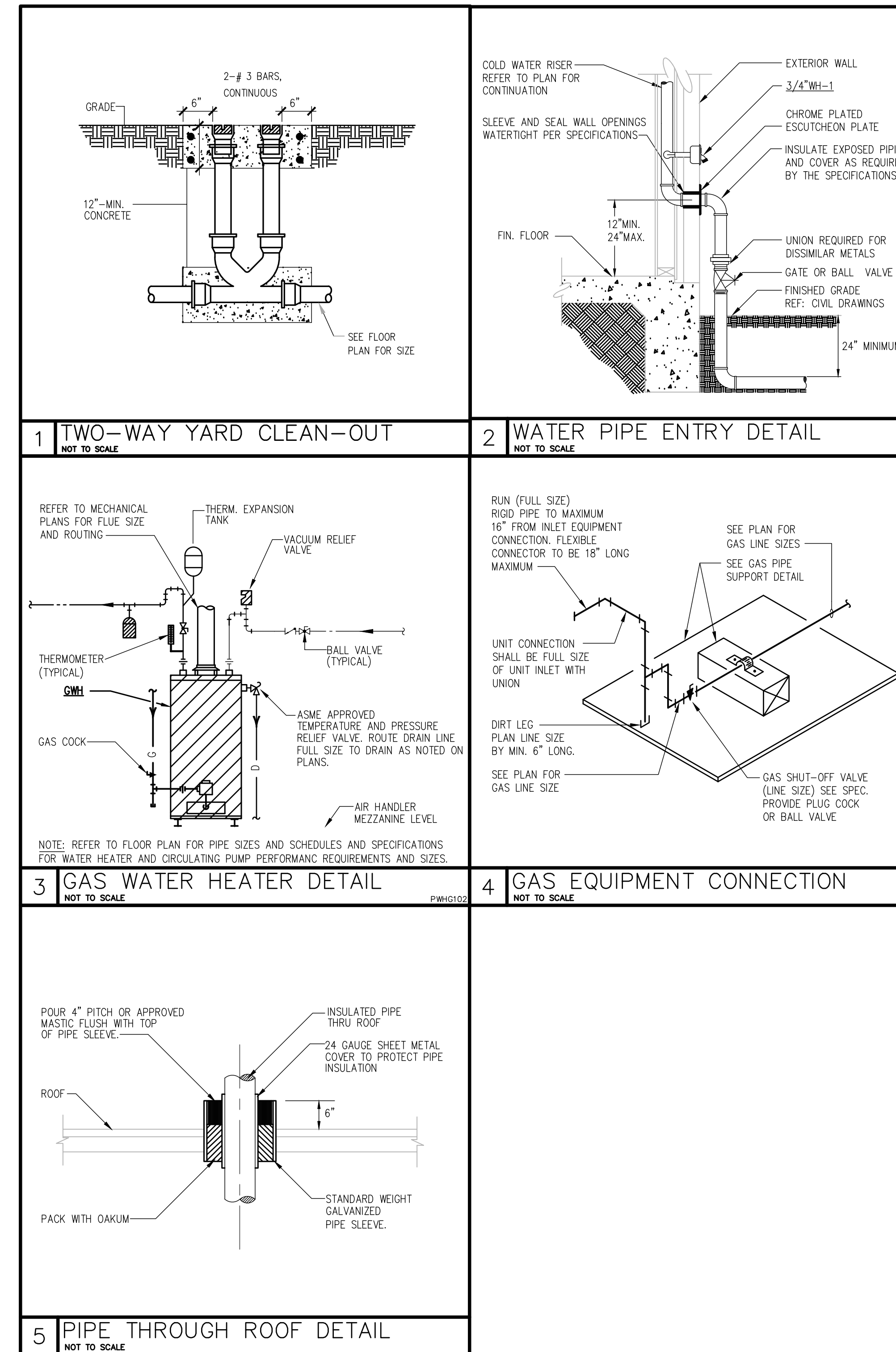
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2902 NORTH FLORES
 SAN ANTONIO, TEXAS 78212
 210.393.1840 PHONE
 SAN ANTONIO - RGV
 TBPE FIRM REGISTRATION NO. 13361

PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH

PLUMBING
 PLAN
P2.0

BASIS OF DESIGN		CONNECTION SIZE					
MANUFACTURER	CATALOG NUMBER	CW INCHES	HM INCHES	TW INCHES	WASTE INCHES	INDIRECT WASTE INCHES	VENT INCHES
AMERICAN STANDARD	CADET FLOWISE "2467.100"	1/2"	-	-	4"	-	2"
AMERICAN STANDARD	"LUCERNE" 0355.012 MOEN "M-BITION" 8800F05	1/2"	1/2"	1/2"	2"	-	2"
ELKAY	LRAD972255 FAUCET LKHA4031	1/2"	1/2"	-	2"	-	2"
ELKAY	LRAD291855 FAUCET LKHA4031	1/2"	1/2"	-	2"	-	2"
BRADFORD WHITE	RG24056N	-	-	-	-	-	-
MOEN	T2663EP + 2520	1/2"	1/2"	-	2"	-	2"



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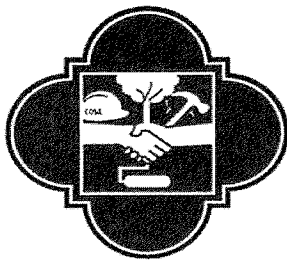
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 210.393.1840 PHONE
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PROJECT NO. 17-019
 ISSUE DATE: 04.10.18
 DRAWN BY: HM3
 REVIEWED BY: AH
 PLUMBING
 SCHEDULES &
 DETAILS
P3.0



CITY OF SAN ANTONIO
DEVELOPMENT SERVICES DEPARTMENT
1901 S. ALAMO | SAN ANTONIO, TEXAS 78204 | (210) 207-1111 | www.sanantonio.gov/dsd



September 5, 2018

SAN ANTONIO HOUSING AUTHORITY (AC74252)
818 S FLORES
SAN ANTONIO, TX 78204

Dear Customer:

Development Services Department records indicate that you are the primary contact for certain permits with unpaid fees. The following show unpaid fees totaling **\$1,703.00**:

APNO	PERMIT TYPE	PROJECT ADDRESS	AMOUNT
2303525	RESBLDGGEN	830 RITA	\$1,703.00

Unless these fees are paid in a timely manner, you may not be able to obtain final inspections, utility releases, and/or future permits. In addition, a stop work order may be placed on the above-listed permit(s).

Please remit payments payable to: **City of San Antonio**, using the following options:

By check – Please list AP# on check and mail to: City of San Antonio Development Services Department P.O. Box 839966 San Antonio, TX 78283-3966	In person – at 1901 S. Alamo, San Antonio, TX 78204 By credit card – call (210) 207-1111 On-line at www.sanantonio.gov/permits
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Please note that the amount(s) listed above may not be current.

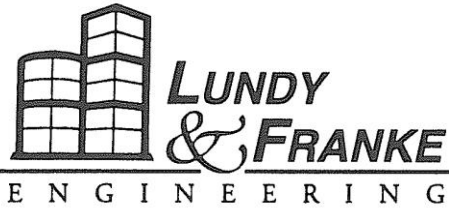
To check your Escrow Balance, please visit:	http://bit.ly/DSDescrow
To view all unpaid fees, please visit:	http://bit.ly/DSDsearch

If you are not responsible for these fees, or have made payment in full, please contact the Development Services Department at (210) 207-1111 or email DSD-AR-inquiry@sanantonio.gov.

Thank you for your prompt attention to this matter.

Respectfully,

Development Services Department



January 22, 2017

Durand-Hollis Rupe Architects, Inc.

14603 Huebner Road, Building 18
San Antonio, Texas 78230

Attn: Mr. Joe Pardo

Re: TL Shaley Apartments
San Antonio, TX

This letter is to advise you that we have visited the above referenced structure and have identified the structural framing system as burned out.

The existing structure is a wood framed structure, which was completely burned out by fire and all the debris has been removed from the property. The existing foundation is to remain and is capable of supporting the new loads.

The opinions expressed in this letter are limited to matters expressly stated herein and no opinions are implied, or should be inferred, beyond the matters stated. In the formulation of our opinions, we have made and relied upon the assumptions that all statements and representations made to us are true and correct.

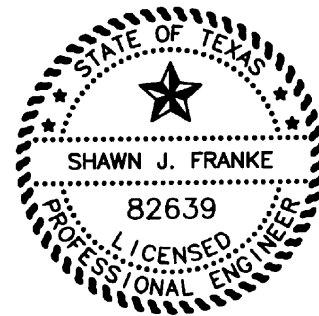
Our professional services have been performed with a level of skill and expertise which is usual and customary for professional engaged in this type of work and is consistent with generally accepted engineering practice.

We appreciate this opportunity to be of service. Please call if you have any questions or if we can be of further assistance.

Sincerely yours,

LUNDY & FRANKE ENGINEERING, INC.

Shawn J. Franke, P.E.
SJF/lf



A handwritten signature in cursive script that reads 'Shawn J. Franke'.

ADDENDUM

REGARDING ALLOWANCES AND ALTERATION PROJECT PROCEDURES

1. **SPECIFICATION SECTION 012100 – ALLOWANCES**
 - A. **DELETE:** Entire Section

2. **SPECIFICATION SECTION 013516 – ALTERATION PROJECT PROCEDURES**
 - A. **DELETE:** Entire Section

3. **SPECIFICATION SECTION -13516 – ALTERATION PROJECT PROCEDURES (REVISED)**
 - A. **ADD:** Entire Section (see attached)

END OF ADDENDUM

SECTION 013516 - ALTERATION PROJECT PROCEDURES (REVISED)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

- A. **Alteration Work:** This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. **Consolidate:** To strengthen loose or deteriorated materials in place.
- C. **Design Reference Sample:** A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. **Dismantle:** To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. **Match:** To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. **Refinish:** To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. **Repair:** To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. **Replace:** To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. **Replicate:** To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. **Reproduce:** To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. **Retain:** To keep existing items that are not to be removed or dismantled.
- L. **Strip:** To remove existing finish down to base material unless otherwise indicated.

1.3 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Architect, and Contractor, Owner's insurer, testing service representative, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Fire-prevention plan.
 - b. Governing regulations.
 - c. Areas where existing construction is to remain and the required protection.
 - d. Hauling routes.
 - e. Sequence of alteration work operations.
 - f. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - 3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at bi-weekly or monthly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 - 1. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
 - 2. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.4 N/A

1.5 INFORMATIONAL SUBMITTALS

- A. Alteration Work Program: Submit 30 days before work begins.
- B. Fire-Prevention Plan: Submit 30 days before work begins.

1.6 QUALITY ASSURANCE

A. Site Work:

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control, coordinate with continuing on-site operations and other known work in progress.
2. Debris Hauling: Coordinate with Architect or Owner on debris hauling routes, turning radii, and locations and details of temporary protective barriers.

C. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

D. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.7 EXISTING MATERIALS TO REMAIN

A. Existing Materials to Remain: Protect site and concrete foundation indicated to remain against damage and soiling from construction work.

1.8 EXISTING CONCRETE FOUNDATION REPAIRS

A. Existing Concrete Foundation to Repair:

1. Power wash existing foundation and clean stains as needed.
2. Patch and repair surface cracks and small broken areas.
3. Clean and remove any brick mortar from foundation's brick ledge.
4. Fill-in any recessed areas of the foundation and level with adjoining concrete.
5. Apply sealer to concrete foundation areas that will not receive a new finished floor.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
 - 3. Erect temporary barriers to form and maintain fire-egress routes.
 - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
 - 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 - 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

- B. Temporary Protection of Materials to Remain:
 - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 - 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of new work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

- A. Record existing work before each procedure (preconstruction), and record progress during the work.
- B. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- C. Notify Architect or Owner of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect or Owner.

END OF SECTION 013516

General Specifications Manual
For
San Antonio Housing Authority
TL Shaley Apartments - Restoration
4827 Pettus St.
San Antonio, Texas 78228

DHR Project # 17-
May, 2018



Durand-Hollis Rupe Architects, Inc.
14603 Huebner Road, Building 18, San Antonio, Texas 78230
Telephone: 210.308.0080, Fax: 210.697.3309

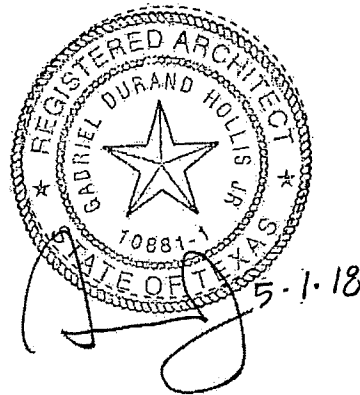
Project Specifications Manual

For

San Antonio Housing Authority (SAHA)
TL Shaley Apartments Restoration
4827 PETTUS ST., SAN ANTONIO, TEXAS 78228

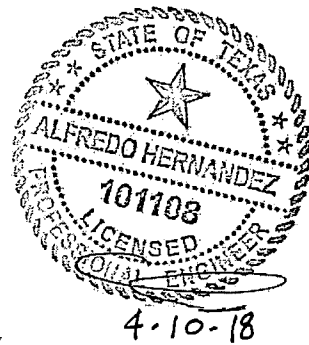
ARCHITECT:

DURAND-HOLLIS RUPE ARCHITECTS, INC.
14603 HUEBNER ROAD, BUILDING 18
SAN ANTONIO, TEXAS 78230
PHONE: 210.308.0080
FAX: 210.697.3309



MEP ENGINEER: (Specifications on Drawings)

HM3 ENGINEERING
2902 N. FLORES
SAN ANTONIO, TEXAS 78212
PHONE: 210.393.1840



**San Antonio Housing Authority (SAHA)
TL Shaley Apartments Restoration
4827 Pettus St., San Antonio, Texas 78228**

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Work restrictions.
5. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: San Antonio Housing Authority – TL Shaley Apartments, Restoration

1. Project Location: 4827 Pettus St., San Antonio, Texas 78228.

B. Owner: San Antonio Housing Authority, 818 S. Flores, San Antonio, Texas 78204.

1. Owner's Representative: Hector Martinez, Director of Construction Services and Sustainability.

C. Architect: DHR Architects, Inc..

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Restoration of entire one story, 1,750 SF, two apartment unit on an existing concrete foundation. New wood framing and trusses, exterior brick veneer with vinyl type windows and wood type doors and an asphalt shingle roof. Interior finishes include wood stud framing with painted gypsum board walls and ceilings; flush wood doors and vinyl composition tile floors. Bath rooms to have ceramic tile floors and wainscot walls. Kitchens to have residential plastic laminate cabinets and countertops. Mechanical system to be residential central heating units. Electrical system to be residential service with energy saving electrical lighting. Plumbing to be standard fixtures for bath and kitchen and water heaters.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Adjacent Apartment Units: Contractor to secure and protect construction site at all time and not block access to tenants of surrounding apartment units.

1.5 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: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving adjacent Apartment units unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Architect and Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

San Antonio Housing Authority – TL Shaley Apartments Restoration

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Contingency allowances.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.3 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific fee services noted in ATTACHMENT 1.

1.6 CONTINGENCY ALLOWANCES

- A. Use the Contingency Allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.7 ADJUSTMENT OF CONTINGENCY ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES: (**See ATTACHMENT 1**)

A. Allowance No. One (1):

- 1. Lump Sum Allowance of \$6,385 for Architectural & Engineering Fee to Design New Slab.

B. Allowance No. Two (2)

- 1. Contingency Allowance of \$20,000 to complete the Slab Demolition and New Slab Installation

END OF SECTION 012100

ATTACHMENT 1

This Project's Scope of Work is to be completed in five separate Phases:

- Phase One is the demolition of the fire damaged structure,
- Phase Two is the abatement of the mastic and VCT tile on the foundation, as per the Scope of Work for Asbestos- Containing Building Materials Remediation prepared by Terracon Consultants, dated 8/22/2017 for the San Antonio Housing Authority.
- Phase three is the forensic testing of the existing concrete slab,
- Phase four is the design, demolition and construction of the new concrete slab as an Additional Scope of Work,
- Phase five is the construction of the apartment building above the concrete slab.

The General Contractor is directed to notify the Architect when the demolition of the fire damaged structure is completed, the vinyl tile and mastic has been abated, and the concrete slab has been fully exposed. DHR Architects will contact PSI Engineering Consultants and they will perform a forensic slab test. The test will include a Mechanical Sounding Test on the existing slab that will verify the integrity of the existing slab.

If the concrete slab passes the test, the General Contractor is to continue with the construction of Phase Five.

If the concrete slab fails the test, there will be a 45 day extension to the project schedule in order to allow time for an Additional Scope of Work to be completed.

The Additional Scope of Work is as follows:

1. Initiate the New Slab Design, Lump Sum Allowance #1, by making payment to the Architect for the fixed Proposal fee of \$6,385. Included in this fee are the following:
 - a. A fee for Architectural Coordination
 - b. The Geotechnical Testing
 - c. The Structural Design
 - d. The Plumbing Design for utility connections below the slab
2. Demolish the existing concrete slab and all underground utilities.
3. Initiate the geotechnical testing by giving the testing consultant a written notice to proceed
 - a. The testing report is expected to take 10 days to be delivered
4. Excavate the existing soil to the specifications of the Geotechnical Report.
 - a. DHR anticipates an excavation depth of 36".
5. Prepare the foundation base, Install the foundation forms, install reinforcing and connect the underground utilities.
6. Notify the Structural Consultant to review the reinforcing and form work.
 - a. Respond to Structural Consultant comments
7. Install the concrete and finish the slab
8. General Contractor is provided a Contingency Allowance #2 of \$20,000 to complete the demolition and new concrete slab installation.

9. Upon the demolition of the existing concrete slab and the completion of the new slab, the Contingency will be adjusted with an add/deduct Change Order to the Contract. The General Contractor will be required to submit time and material invoices to verify the amount of the Change Order.

SECTION 012100 – ALLOWANCES (REVISED)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Owner from the designated supplier.

1.3 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor to provide Allowance No. One.

1.6 CONTINGENCY ALLOWANCES (NOT USED)

1. of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES:

- A. Allowance No. One (1):
 1. Lump Sum Allowance of \$1,400 for four (4) Ceiling Fans on 1st Floor, Manufacturer and Model to be selected by Owner. Installation (all labor and other materials) to be included in Base Bid.

END OF SECTION 012100

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

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

1.3 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. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

- e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. 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 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.

1.4 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.

1.5 PROCEDURES

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

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

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- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 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.

1.3 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 time specified in Proposal Request or 20 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 Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.4 CHANGE ORDER PROCEDURES

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

1.5 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.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.6 WORK CHANGE DIRECTIVE

- A. Work Change Directive: Architect may issue a Work Change Directive on EJCDC Document C-940. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 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 items required to be 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 seven 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. Arrange schedule of values consistent with format of AIA Document G703.
 - 2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - 3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 - 4. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 - 5. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
 - 6. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 - 7. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 - 8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.3 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.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts 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 and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit two signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. 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 or 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. 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.
- H. 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 (preliminary if not final).
 5. Sustainable design action plans, including preliminary project materials cost data.
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
- I. 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 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.
- J. 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 where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 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 items required to be 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 seven 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. Arrange schedule of values consistent with format of AIA Document G703.
 - 2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - 3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 - 4. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 - 5. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
 - 6. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 - 7. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
 - 8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.3 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.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 - 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts 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 and Construction Change Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit two signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. 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 or 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. 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.
- H. 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 (preliminary if not final).
 5. Sustainable design action plans, including preliminary project materials cost data.
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
 14. Certificates of insurance and insurance policies.
 15. Performance and payment bonds.
 16. Data needed to acquire Owner's insurance.
- I. 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 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.
- J. 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 where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

San Antonio Housing Authority – TL Shaley Apartments Restoration

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. 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. RFIs.
 - 4. Digital project management procedures.
 - 5. Project meetings.
- B. Related Requirements:
 - 1. Section 011200 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or 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, telephone number, and email address of 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.

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 that 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. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- C. RFI Forms: AIA Document G716.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by 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 Architect's time for response will date from time of receipt by Architect 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 Contractor to submit Change Proposal according to Section 012600 "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 10 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 monthly. Include the following:
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were 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 days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Architect's Data Files Not Available: Architect will not provide Architect's BIM model or CAD drawing digital data files for Contractor's use during construction.
- B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare 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.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Sustainable design requirements.
 - o. Preparation of Record Documents.
 - p. Use of the premises[**and existing building**].
 - q. Work restrictions.
 - r. Working hours.
 - s. Owner's occupancy requirements.
 - t. Responsibility for temporary facilities and controls.
 - u. Procedures for moisture and mold control.
 - v. Procedures for disruptions and shutdowns.
 - w. Construction waste management and recycling.
 - x. Parking availability.
 - y. Office, work, and storage areas.
 - z. Equipment deliveries and priorities.
 - aa. First aid.
 - bb. Security.

- cc. Progress cleaning.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. 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 the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

- D. Progress Meetings: Conduct progress meetings at regular intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 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 status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
 4. Minutes: Entity 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.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Construction schedule updating reports.
 - 3. Daily construction reports.
 - 4. Site condition reports.
- B. Related Requirements:
 - 1. Section 011200 "Multiple Contract Summary" for preparing a combined Contractor's Construction Schedule.

1.2 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. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF file.
 - 3. Two paper copies, of sufficient size to display entire period or schedule, as required.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 - 3. Total Float Report: List of activities sorted in ascending order of total float.
- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Daily Construction Reports: Submit at monthly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use Microsoft Project, for current Windows operating system.
- B. Time Frame: Extend schedule from date established for commencement of the Work 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.
- C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by 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 Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 5. Commissioning Time: Include no fewer than 15 days for commissioning.
 6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 3. 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. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

- F. 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 Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.

- G. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.

- H. Recovery Schedule: When periodic update indicates the Work is 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, equipment required to achieve compliance, and date by which recovery will be accomplished.

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

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for commencement of the Work.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.7 REPORTS

- A. 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. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Work Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect'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 responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list 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.

1.4 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
 - 1. Project name.
 - 2. Date.
 - 3. Name of Architect.
 - 4. Name of Contractor.
 - 5. Name of firm or entity that prepared submittal.
 - 6. Names of subcontractor, manufacturer, and supplier.
 - 7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
 - 8. Category and type of submittal.
 - 9. Submittal purpose and description.

10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Action Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will return one copy.
4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
5. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using AIA Document G810 transmittal form.

E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

F. Submittals for Web-Based Project Software: Prepare submittals as PDF files, or other format indicated by Project software website.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package, and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
2. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
3. Paper: Prepare submittals in paper form, and deliver to Architect.

- B. 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.
- C. 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 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. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- E. 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.
- F. 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.

1.6 SUBMITTAL REQUIREMENTS

- A. 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 are unsuitable 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. For equipment, include the following in addition to the above, as applicable:

- a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. 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 unless submittal based on Architect's digital data drawing files is otherwise permitted.
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. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 11 by 17 inches but no larger than 30 by 42 inches.
 - a. Two opaque (bond) copies of each submittal. Architect will return one copy(ies).
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
 4. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 5. Paper Transmittal: Include paper transmittal including complete submittal information indicated.

6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine 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.
7. 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 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.
8. 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. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Architect will retain one 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 sets of paired units that show approximate limits of variations.
- D. 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:
- E. 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 information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes 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. Provide a notarized signature where indicated.
2. 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.
3. 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.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on 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.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. 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.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. 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.
6. 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:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.7 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and two paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.
 - 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action, as follows:
 - a. Insert description of each action indicated on Architect's stamp.
 - 2. Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - a. Insert description of each action indicated on Architect's stamp.
 - 3. Submittals by Web-Based Project Software: Architect will indicate, on Project software website, the appropriate action.

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- a. Actions taken by indication on Project software website have the following meanings:
 - 1) Insert description of each action indicated on Architect's stamp.
- 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. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

- A. **Alteration Work:** This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. **Consolidate:** To strengthen loose or deteriorated materials in place.
- C. **Design Reference Sample:** A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. **Dismantle:** To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. **Match:** To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. **Refinish:** To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. **Repair:** To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. **Replace:** To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. **Replicate:** To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. **Reproduce:** To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. **Retain:** To keep existing items that are not to be removed or dismantled.
- L. **Strip:** To remove existing finish down to base material unless otherwise indicated.

1.3 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Architect, and Contractor, Owner's insurer, testing service representative, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Fire-prevention plan.
 - b. Governing regulations.
 - c. Areas where existing construction is to remain and the required protection.
 - d. Hauling routes.
 - e. Sequence of alteration work operations.
 - f. Storage, protection, and accounting for salvaged and specially fabricated items.
 - g. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - 3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at bi-weekly or monthly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 - 1. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
 - 2. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.4 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1.5 INFORMATIONAL SUBMITTALS

- A. Alteration Work Program: Submit 30 days before work begins.
- B. Fire-Prevention Plan: Submit 30 days before work begins.

1.6 QUALITY ASSURANCE

- A. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.
- B. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
 - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
 - 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- C. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
- D. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.7 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
 - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
 - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area **[on-site] [off-site] [designated by Owner] [indicated on Drawings]**.
 - 5. Protect items from damage during transport and storage.
- B. Salvaged Materials for Reinstallation:
 - 1. Repair and clean items for reuse as indicated.
 - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
 - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
 - 2. Secure stored materials to protect from theft.
 - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
 - 3. Erect temporary barriers to form and maintain fire-egress routes.
 - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
 - 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 - 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- B. Temporary Protection of Materials to Remain:
 - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 - 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
 1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

- A. Record existing work before each procedure (preconstruction), and record progress during the work.
- B. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- C. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 013516

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described 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.
- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. 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, assembly, and similar operations.
 - 1. 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).
- D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as part of permanent construction, consisting of multiple products, assemblies, and subassemblies.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. 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.
- J. 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. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 DELEGATED-DESIGN SERVICES

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

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements 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 direction 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

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

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- B. 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.
- C. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 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, telephone number, and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.

- 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. Statement on condition of substrates and their acceptability for installation of product.
 - 2. Statement that products at Project site comply with requirements.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.

- C. **Factory-Authorized Service Representative's Reports:** Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Statement that equipment complies with requirements.
 - 2. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 3. Other required items indicated in individual Specification Sections.

1.8 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 required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- 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 required units.

- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, applying, 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. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

- F. **Specialists:** Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection 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.
- H. 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.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - d. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 6. Obtain Architect's approval of mockups before starting corresponding work, fabrication, or construction.

- a. Allow seven days for initial review and each re-review of each mockup.
 - 7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 8. Demolish and remove mockups when directed unless otherwise indicated.
- L. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.

1.9 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 inspection they are engaged to perform.
 - 2. 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, whether specified or not, to verify and document that the Work complies with requirements.
- 1. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
- 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the locations 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 quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. **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 Section 013300 "Submittal Procedures."
- F. **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 preinstallation 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.
- G. **Associated Contractor Services:** Cooperate with agencies and representatives 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 inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 6. Security and protection for samples and for testing and inspection equipment at Project site.
- H. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.10 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 the Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

2. Notifying Architect 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 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.
7. .

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

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

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, 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 Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

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

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
 1. AABC - Associated Air Balance Council; www.aabc.com.
 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 7. ABMA - American Boiler Manufacturers Association; www.abma.com.
 8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org
 9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 11. AF&PA - American Forest & Paper Association; www.afandpa.org.
 12. AGA - American Gas Association; www.aga.org.
 13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 15. AI - Asphalt Institute; www.asphaltinstitute.org.
 16. AIA - American Institute of Architects (The); www.aia.org.
 17. AISC - American Institute of Steel Construction; www.aisc.org.
 18. AISI - American Iron and Steel Institute; www.steel.org.
 19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 21. ANSI - American National Standards Institute; www.ansi.org.
 22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 23. APA - APA - The Engineered Wood Association; www.apawood.org.
 24. APA - Architectural Precast Association; www.archprecast.org.
 25. API - American Petroleum Institute; www.api.org.
 26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 27. ARI - American Refrigeration Institute; (See AHRI).
 28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
 29. ASCE - American Society of Civil Engineers; www.asce.org.
 30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
 31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
 32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
 33. ASSE - American Society of Safety Engineers (The); www.asse.org.

34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CE - Conformite Europeenne; <http://ec.europa.eu/growth/single-market/ce-marking/>
51. CEA - Canadian Electricity Association; www.electricity.ca.
52. CEA - Consumer Electronics Association; www.ce.org.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.pbmdf.com.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - Canadian Standards Association; www.csa.ca.
65. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
66. CSI - Construction Specifications Institute (The); www.csinet.org.
67. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
71. DHI - Door and Hardware Institute; www.dhi.org.
72. ECA - Electronic Components Association; (See ECIA).
73. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
74. ECIA - Electronic Components Industry Association; www.eciaonline.org.
75. EIA - Electronic Industries Alliance; (See TIA).
76. EIMA - EIFS Industry Members Association; www.eima.com.
77. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
78. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
79. ESTA - Entertainment Services and Technology Association; (See PLASA).
80. ETL - Intertek (See Intertek); www.intertek.com.

81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsintitute.org.
83. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
84. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
85. FM Approvals - FM Approvals LLC; www.fmglobal.com.
86. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
87. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarroof.com.
88. FSA - Fluid Sealing Association; www.fluidsealing.com.
89. FSC - Forest Stewardship Council U.S.; www.fscus.org.
90. GA - Gypsum Association; www.gypsum.org.
91. GANA - Glass Association of North America; www.glasswebsite.com.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
95. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
96. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
97. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
98. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
99. IAS - International Accreditation Service; www.iasonline.org.
100. IAS - International Approval Services; (See CSA).
101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; www.iccsafe.org.
103. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
104. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
105. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
106. IEC - International Electrotechnical Commission; www.iec.ch.
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
111. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
112. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
113. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
114. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
115. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
116. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
117. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
118. ISO - International Organization for Standardization; www.iso.org.
119. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
120. ITU - International Telecommunication Union; www.itu.int/home.
121. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
122. LMA - Laminating Materials Association; (See CPA).
123. LPI - Lightning Protection Institute; www.lightning.org.

124. MBMA - Metal Building Manufacturers Association; www.mbma.com.
125. MCA - Metal Construction Association; www.metalconstruction.org.
126. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
127. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
128. MHIA - Material Handling Industry of America; www.mhia.org.
129. MIA - Marble Institute of America; www.marble-institute.com.
130. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
131. MPI - Master Painters Institute; www.paintinfo.com.
132. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
133. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
134. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
135. NADCA - National Air Duct Cleaners Association; www.nadca.com.
136. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
137. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
138. NBI - New Buildings Institute; www.newbuildings.org.
139. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
140. NCMA - National Concrete Masonry Association; www.ncma.org.
141. NEBB - National Environmental Balancing Bureau; www.nebb.org.
142. NECA - National Electrical Contractors Association; www.necanet.org.
143. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
144. NEMA - National Electrical Manufacturers Association; www.nema.org.
145. NETA - InterNational Electrical Testing Association; www.netaworld.org.
146. NFHS - National Federation of State High School Associations; www.nfhs.org.
147. NFPA - National Fire Protection Association; www.nfpa.org.
148. NFPA - NFPA International; (See NFPA).
149. NFRC - National Fenestration Rating Council; www.nfrc.org.
150. NHLA - National Hardwood Lumber Association; www.nhla.com.
151. NLGA - National Lumber Grades Authority; www.nlga.org.
152. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
153. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
154. NRCA - National Roofing Contractors Association; www.nrca.net.
155. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
156. NSF - NSF International; www.nsf.org.
157. NSPE - National Society of Professional Engineers; www.nspe.org.
158. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
159. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
160. NWFA - National Wood Flooring Association; www.nwfa.org.
161. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
162. PDI - Plumbing & Drainage Institute; www.pdionline.org.
163. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); <http://www.plasa.org>.
164. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
165. RFCI - Resilient Floor Covering Institute; www.rfci.com.
166. RIS - Redwood Inspection Service; www.redwoodinspection.com.
167. SAE - SAE International; www.sae.org.
168. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
169. SDI - Steel Deck Institute; www.sdi.org.
170. SDI - Steel Door Institute; www.steeldoor.org.

171. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
172. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
173. SIA - Security Industry Association; www.siaonline.org.
174. SJI - Steel Joist Institute; www.steeljoist.org.
175. SMA - Screen Manufacturers Association; www.smainfo.org.
176. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
177. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
178. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
179. SPIB - Southern Pine Inspection Bureau; www.spib.org.
180. SPRI - Single Ply Roofing Industry; www.spri.org.
181. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
182. SSINA - Specialty Steel Industry of North America; www.ssina.com.
183. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
184. STI - Steel Tank Institute; www.steel tank.com.
185. SWI - Steel Window Institute; www.steelwindows.com.
186. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
187. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
188. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
189. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
190. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
191. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
192. TMS - The Masonry Society; www.masonrysociety.org.
193. TPI - Truss Plate Institute; www.tpinst.org.
194. TPI - Turfgrass Producers International; www.turfgrasssod.org.
195. TRI - Tile Roofing Institute; www.tilerroofing.org.
196. UL - Underwriters Laboratories Inc.; <http://www.ul.com>.
197. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
198. USAV - USA Volleyball; www.usavolleyball.org.
199. USGBC - U.S. Green Building Council; www.usgbc.org.
200. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
201. WASTEC - Waste Equipment Technology Association; www.wastec.org.
202. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
203. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
204. WDMA - Window & Door Manufacturers Association; www.wdma.com.
205. WI - Woodwork Institute; www.wicnet.org.
206. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
207. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.

4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; www.quicksearch.dla.mil.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov/fdsys.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeial Convention; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).

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7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS; California Department of Health Services; (See CDPH).
 4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
 5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservation.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 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 engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: 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.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste-handling procedures.
5. Other dust-control measures.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 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.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
 3. Drinking water and private toilet.
 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction. and clean HVAC system as required in Section 017700 "Closeout Procedures."
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 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 each facility 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.

3.3 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. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service underground unless otherwise indicated.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is 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 Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated within construction limits indicated on Drawings.
 - 1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. 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 fire-fighting equipment and access to fire hydrants.
- D. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- F. 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 public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touch up signs so they are legible at all times.
- G. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- H. 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 Section 017300 "Execution."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- J. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including if required replacing worn cables, guide shoes, and similar items of limited life.
1. Do not load elevators beyond their rated weight capacity.
 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.5 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 damage to existing facilities.
 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- 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: Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 311000 "Site Clearing."
- D. 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 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- F. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- H. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control

procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

- I. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations and as indicated on Drawings.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- J. 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.
- K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- L. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- M. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- N. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas when needed from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Provide walk-off mats at each entrance through temporary partition.
- O. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, 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.
 3. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: 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.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.
 4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard and replace stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

3.7 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.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- 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 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. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.2 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.
 - 2. 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 by Architect 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 single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.3 ACTION SUBMITTALS

- A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design 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 seven days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Architect's Approval of Submittal: As specified in Section 013300 "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 Section 013300 "Submittal Procedures." Show compliance with requirements.

1.4 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.

1.5 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 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.

1.6 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 other Sections for specific content requirements and particular requirements for submitting special warranties.

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 items needed for a complete installation and indicated use and effect.
 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 meeting 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.
- B. Product Selection Procedures:
 1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: ..."
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: ..."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.
 - a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 2. Evidence that proposed product provides specified warranty.
 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 4. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 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. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.

- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.2 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

- C. Certified Surveys: Submit two copies signed by land surveyor or professional engineer.

- D. Final Property Survey: Submit 3 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

- B. 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 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.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- 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. General: Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities.

2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. 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 roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. 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.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. 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 requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

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

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Engage a land surveyor or professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Remove and replace damaged, defective, or non-conforming Work.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. 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.
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots 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. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as 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.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall

- coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition 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.

3.7 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 more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 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 contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator 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 Section 015000 "Temporary Facilities and Controls." And Section 017419 "Construction Waste Management and Disposal."

- 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. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 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. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

- B. Related Requirements:
 - 1. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 2. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 3. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 5. Submit testing, adjusting, and balancing records.
 6. Submit sustainable design submittals not previously submitted.
 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1.5 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Architect will return annotated file.
 - b. PDF electronic file. Architect will return annotated file.

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

- C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit by email to Architect.
- D. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
- E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - c. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - d. Sweep concrete floors broom clean in unoccupied spaces.

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- e. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - f. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - g. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - h. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - i. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls." and Section 017419 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations, before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and Commissioning Authority will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Pre-Submit one bound paper copy for Architect's review. Enable reviewer comments on draft submittals.
- C. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- D. Final Manual Submittal: Submit 3 paper copies each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1.3 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
2. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.4 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for Architect.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.5 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds, as described below.
- C. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.

2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- H. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1.7 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.

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- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 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.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one paper copy set.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, no marked-up Product Data is required.

1.3 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 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. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings 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 Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where 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 with comment function enabled.

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 with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 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.

1.4 RECORD SPECIFICATIONS

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

1.5 RECORD PRODUCT DATA

- 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; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- C. Format: Submit record Product Data as annotated PDF electronic file paper copy or scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.6 MAINTENANCE OF RECORD DOCUMENTS

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

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

SECTION 024116 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of buildings materials and equipment.

1.2 MATERIALS OWNERSHIP

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

1.3 PREINSTALLATION MEETINGS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of building.**
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.**
1. **Adjacent Buildings: Detail special measures proposed to protect adjacent buildings including means of egress from those buildings.**
- C. Schedule of building demolition activities with starting and ending dates for each activity.**
- D. Predemolition photographs or video.**

1.5 FIELD CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.**
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.**
1. **Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.**
 2. **Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.**

- a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Arrange demolition schedule so as not to interfere with operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- C. Inventory and record the condition of items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
 - 1. Verify if Owner will arrange to shut off utilities when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.

3. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 015000 "Temporary Facilities and Controls."
 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 2. Protect existing site improvements and appurtenances.
 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 4. Provide temporary security barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 6. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION

- A. General: Demolish indicated building and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 2. Maintain fire watch during and for at least six (6) hours after flame-cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- C. Explosives: Use of explosives is not permitted.
- D. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- E. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- F. Existing Utilities: Maintain existing utilities and below-grade utility structures that are within **[5 feet]** outside footprint indicated for new construction.
- G. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials.
- H. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.
- I. Promptly repair damage to adjacent buildings caused by demolition operations.

3.5 CLEANING

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
- B. Do not burn demolished materials.
- C. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION 024116

SECTION 024200 -

Scope of Work For Asbestos-Contaminated Building Materials Remediation

T.L. Shaley Apartments

830 & 832 Rita Avenue

San Antonio, Texas

August 22, 2017

Terracon Project No. 90177455



Will C. DeVeau
Individual Asbestos Consultant
TDSHS License No. 105734
Expires 03/10/2019

Prepared for:

San Antonio Housing Authority

San Antonio, Texas

Prepared by:

Terracon Consultants, Inc.

San Antonio, Texas

6911 Blanco Road (210)641-2112
San Antonio, TX 78216 terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

SCOPE OF WORK

ASBESTOS-CONTAMINATED BUILDING MATERIALS REMEDIATION

T.L. Shaley Apartments

830 & 832 Rita

San Antonio, Texas

I. PURPOSE

The purpose of this Scope of Work is to relate the general requirements for remediation (removal) of asbestos-contaminated building materials that will be generated from the demolition of the T.L. Shaley Apartments located at 830 and 832 Rita, San Antonio, Texas. Asbestos-containing resilient floor tile and associated mastic materials were identified as part of an asbestos inspection conducted by Terracon personnel on July 10, 2017 (Terracon Report No. 90177369). A representative of the City of San Antonio building inspection division has inspected the above referenced building and found the building to be structurally unsound and unsafe to enter. Therefore, the identified asbestos-containing material within the structure will be demolished in place with the structure, and all of the building components (except for concrete foundation) and associated debris will become asbestos-contaminated building materials and disposed of as asbestos containing waste. The typical building components that will become asbestos-contaminated during the demolition will include materials such as: wood framing, exterior brick, composition roofing shingles and miscellaneous metal components.

The **CONTRACTOR** will perform the demolition/removal and disposal of asbestos-contaminated building materials in accordance with current local, state and federal regulations. The **Contractor** shall be licensed as an asbestos abatement contractor by the Texas Department of State Health Services (TDSHS). And all work will be conducted by properly trained and licensed asbestos abatement personnel working under the requirements of the TDSHS Texas Asbestos Health Protection Rules.

II. WORK AREA

The Contractor will demarcate and regulate the work area with suitably secured asbestos specific barrier tape located a minimum of 5 linear feet (5') beyond the delineated work area on all sides of the building, wherever feasible. The Contractor will install a berm system around the exterior of the building at the perimeter of the regulated area for controlling contaminated water runoff. The berm system will consist of a trench system or an absorbent barrier that will contain the water within the regulated area. The water contained within the regulated area will be properly filtered through a HEPA filtration system prior to being removal from the regulated area. Only personnel properly trained and appropriately licensed will be permitted within the regulated work area during remediation activities.



Will C. DeVeau / TDSHS IAC # 105734
Expiration Date: 03/10/2019

Scope of Work

T.L. Shaley Apartments, 830 and 832 Rita ■ San Antonio, Texas
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III. PERSONAL PROTECTIVE EQUIPMENT

Asbestos workers directly involved with the asbestos-contaminated building materials remediation activities within the regulated work area will wear personal protective equipment consisting of, at a minimum, double protective suits and half-face negative pressure respirators equipped with filter cartridges designed for asbestos-containing dusts, mists and vapors and color coded in accordance with ANSI Z228.2 (1980). Certification that the workers have been fit tested in accordance with current OSHA guidelines will be provided as part of worker documentation. Boots, gloves and eye protection will be available to each worker as needed. Respirators will be worn by workers during asbestos-contaminated building material remediation and waste loading activities, and will be worn when proceeding from the remediation work area to the remote decontamination facility. At the conclusion of remediation work period activities, the workers will remove the outer protective suit within the regulated work area, and the inner protective suit will be worn while proceeding to the remote decontamination facility. All personnel entering the demarcated work area during remediation activities will wear respiratory protection.

IV. REMOTE DECONTAMINATION FACILITY

The Contractor will erect and utilize a remote three-chambered decontamination facility located in a centralized location adjacent to the demarcated work area.

Remote Decontamination System: the shower chamber will not be constructed of disposable/pop up shower systems will not be permitted for the decontamination system. Provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces, Changing Room, Shower Room, and Equipment Room. Require all persons without exception to pass through this decontamination unit for entry into and exiting from the work area for any purpose. Do not allow parallel routes for entry or exit. A changing area surrounded by black poly will be attached to the remote decontamination unit outside the changing room to allow for the worker's privacy.

Changing Room (clean room): Provide a room that is physically and visually separated from the shower room for the purpose of changing into protective clothing. Construct using polyethylene sheeting, at least 6 mil in thickness to provide an airtight seal between the Changing Room and the shower room. Locate so that access to Work Area from Changing Room is through Shower Room. Separate Changing Room from the shower room by a sheet polyethylene flapped doorway. Maintain floor of changing room dry and clean at all times. Do not allow overflow water from shower to wet floor in changing room. Damp wipe all surfaces twice after each shift change with a disinfectant solution.

A handwritten signature in blue ink that reads "Will C. DeVeau".

Will C. DeVeau / TDSHS IAC # 105734
Expiration Date: 03/10/2019

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Provide a continuously adequate supply of disposable bath towels.

Provide posted information for all emergency phone numbers and procedures.

Shower Room: Provide a completely water tight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room.

Construct room by providing a shower pan and 2 shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining floor in the shower pan at an elevation that is at the top of pan.

Separate this room from the Changing and Equipment Rooms with airtight walls fabricated of 6 mil polyethylene.

Provide splash-proof entrances to Changing and Equipment Rooms with 2 doors arranged in the following configuration:

At each entrance to the Shower Room construct a doorframe out of lumber, PVC Pipe or equivalent. Attach to this door frame two overlapping flaps fastened at the head (top) and jambs (sides). Overlap the flaps that present a shingle-like configuration to the water stream from the shower. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.

Provide shower head and controls. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower.

Provide a continuously adequate supply of soap and maintain in sanitary condition. Arrange so that water from showering does not splash into the Changing or Equipment Rooms.

Provide flexible hose showerhead. Pump wastewater to drain or to storage for use in amended water. If pumped to drain, provide 20 micron and 5 micron waste water filters in line to drain or waste water storage. Change filters daily or more often if necessary. Provide Hose Bib.

Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers. Separate this room from the work area by a 6 mil polyethylene flap doorway. Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6 mil polyethylene.

A handwritten signature in blue ink that reads "Will C. DeVeau".

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Work Area: Separate work area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the work area is expected to be high, as in dry removal, add an intermediate cleaning space between the Equipment room and the Work area. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil polyethylene per shift change and remove contaminated layer after each shift.

V. REMEDIATION (REMOVAL) OF ASBESTOS-CONTAMINATED BUILDING MATERIALS

The Contractor will thoroughly wet down all building/work areas prior to commencement of work activities on the site. A source of water is available on the site, and the Contractor will be responsible for routing the water source to the work area. The asbestos-contaminated building materials/debris in the work area will be continuously wetted with sprinklers and/or spray nozzles to prevent the release of **VISIBLE EMISSIONS** throughout the demolition/remediation activities. The Contractor will ensure that the materials remain adequately wet throughout the removal process and take care to prevent excess water runoff.

The asbestos-contaminated building materials/debris within the work area will be abated utilizing mechanical and/or manual methods to expedite the removal of the asbestos-contaminated building materials from the work site. The asbestos contaminated materials will be removed from the specified work areas down to a clean concrete slab and/or sub-grade soil, plus 1 to 2 inches (1" – 2") below the clean sub-grade soil. A visual inspection of the work area will be conducted by the Contractor Supervisor and the Consultant. After the visual inspection if visible assumed asbestos debris is observed, the contaminated soil will be removed down to clean soil and an additional 1 to 2 inches (1" – 2") inches will be removed, and a visual inspection will be conducted. If no assumed asbestos debris is observed following the removal of the additional soil, remediation work will be considered complete.

During the removal of the asbestos contaminated building materials and waste loading activities, **no visible emissions (dust)** will be allowed to occur. If visible emissions are observed, the Contractor will re-wet the asbestos contaminated building materials being worked to eliminate visible emissions.

VI. DISPOSAL

The asbestos contaminated materials removed from the demarcated work area will be disposed of as asbestos-containing material at an approved landfill. The Contractor will supply open-top dumpster receptacles and/or trucks to accept the asbestos contaminated materials. The dumpsters and/or trucks will be lined with 2 layers of 6-mil poly prior to loading of the asbestos contaminated materials. The poly will be secured in such a way as to remain intact and in place during waste loading activities. The poly lining will be installed in such a way as to allow for

A handwritten signature in blue ink that reads "Will C. DeVeau".

Will C. DeVeau / TDSHS IAC # 105734
Expiration Date: 03/10/2019

Scope of Work

T.L. Shaley Apartments, 830 and 832 Rita ■ San Antonio, Texas
August 22, 2017 ■ Terracon Project No. 90177455



“burrito” wrapping and sealing over the asbestos contaminated materials loaded into the dumpsters and/or trucks. Pre-printed Generator Labels shall be affixed to each load prior to departing the work site for transport to the landfill. A waste manifest will be completed by the Contractor and signed by the Client or Consultant prior to the waste leaving the work site.

VII. AIR MONITORING

The Consultant will be conducting up and downwind air sampling during the remediation activities. The air samples will be analyzed by Phase Contrast Microscopy (PCM) in accordance with the National Institute of Occupational Safety and Health Method 7400.

VII. EQUIPMENT DECONTAMINATION

Tools and equipment utilized during any asbestos contaminated materials remediation activities on the work site will be washed down/decontaminated following remediation activities and prior to the tools and equipment leaving the work site. Wash down/decontamination activities will be conducted within the demarcated work area.

VIII. GENERAL REQUIREMENTS

Work site access, parking areas, dumpster and/or truck staging areas will be as directed by the Client. All tools, supplies, waste bags, trash, etc. will be stored in the Contractor’s job trailer at the end of each work period. All work site areas will be cleaned on a daily basis.

A handwritten signature in blue ink, reading "Will C. DeVeau". The signature is written in a cursive style with a horizontal line underneath.

Will C. DeVeau / TDSHS IAC # 105734
Expiration Date: 03/10/2019

ATTACHMENT

Asbestos Inspection Report Information

ASBESTOS SURVEY REPORT

**T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas**

July 27, 2017
Terracon Project No. 90177369



Prepared for:
San Antonio Housing Authority
San Antonio, Texas

Prepared by:
Terracon Consultants, Inc.
San Antonio, Texas

6911 Blanco Road (210) 641-2112
San Antonio, TX 78216 terracon.com

Terracon

Environmental



Facilities



Geotechnical



Materials

July 27, 2017

San Antonio Housing Authority (SAHA)
818 S. Flores
San Antonio, Texas 78204

Attn: Ms. Patti Earnest, CTP
P: (210) 477-6170
E: patti_earnest@saha.org

Re: Asbestos Survey Report
T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas 78228
Terracon Project No. 90177369

Dear Ms. Earnest:

The purpose of this report is to present the results of the asbestos survey performed on July 10, 2017, at the above referenced site in San Antonio, Texas. This survey was conducted in general accordance with our proposal dated June 20, 2017. We understand that this survey was requested to provide information prior to demolition activities associated with the fire damaged apartment buildings.

Asbestos-containing floor tile and mastic materials were identified. Please refer to the attached report for details.

Terracon Consultants, Inc. (Terracon) appreciates the opportunity to provide this service to the San Antonio Housing Authority. If you have any questions regarding this report, please contact the undersigned at (210) 641-2112.

Sincerely,
Terracon Consultants, Inc.

Inspected By:



Warren P. Dean
TDSHS Asbestos Inspector
License No. 60-3403

Reviewed By:



Mitch W. Stogner
TDSHS Individual Asbestos Consultant
License Number 10-5648

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ASBESTOS SURVEY REPORT

**T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas
Terracon Project No. 90177369
July 27, 2017**

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) conducted an asbestos survey of the fire damaged apartment building located at 830 and 832 Rita Avenue in San Antonio, Texas. The survey was conducted on July 10, 2017, by a State of Texas licensed Asbestos Inspector in general accordance with our proposal dated June 20, 2017.

Interior and exterior building components were surveyed and homogeneous areas of suspect asbestos-containing materials (ACM) were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled materials could be located in walls, in voids or in other concealed areas. Suspect ACM samples were collected in accordance with Texas Asbestos Health Protection Rules (TAHPR) and in general accordance with EPA guidance document number EPA 560 5/84-024, and were intended to identify, and assess suspect materials prior to renovation/demolition activities. Samples were delivered to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited and TDSHS licensed laboratory for analysis by Polarized Light Microscopy (PLM) protocol.

1.1 Project Objective

We understand that this survey was requested to provide information prior to demolition activities associated with the fire damaged apartment buildings.

The Texas Department of State Health Services (TDSHS) regulates asbestos-related activities in the State of Texas. The TDSHS Texas Asbestos Health Protection Rules (TAHPR) require that a licensed Asbestos Inspector conduct an asbestos survey which conforms to generally accepted industry standards such as the protocol specified in 40 CFR Part 763.85, commonly referred to as the Asbestos Hazard Emergency Response Act (AHERA) that applies to schools. Other factors are taken into consideration when determining the best method to determine the location, extent and condition of Asbestos-Containing Materials (ACMs) in a non-school building.

EPA regulation 40 CFR 61, Subpart M, National Emission Standards for Hazardous Air Pollutants (NESHAP), prohibits the release of asbestos fibers to the atmosphere during renovation or demolition activities. The asbestos NESHAP, which is enforced by the TDSHS, requires that

prior to the commencement of demolition or renovation, that the facility or part of the facility affected be thoroughly inspected for the presence of both Friable (Regulated Asbestos-Containing Building Materials), and Non-Friable (Category I & II Asbestos-Containing Materials). The Occupational Health and Safety Administration (OSHA) has promulgated a worker protection standard for the disturbance of asbestos during renovation and demolition projects.

2.0 BUILDING DESCRIPTION

Units 830 and 832 are in a one-story wood frame and masonry structure atop a concrete slab-on-grade foundation. The roof consisted of a sloped composition roof system. Interior walls and ceilings consisted of drywall construction with a painted and textured finish. The majority of floors were finished with resilient floor tile. Grouted ceramic tile was observed on the walls of the restrooms. Fiberglass insulation was present above the ceilings and within the walls. The heating, ventilation and air conditioning (HVAC) system equipment was observed in the HVAC closets.

3.0 FIELD ACTIVITIES

The survey was conducted by Mr. Warren Dean; a TDSHS licensed and Environmental Protection Agency (EPA) accredited Asbestos Inspector. A copy of Mr. Deans' license is attached as Appendix D. The survey was conducted in general accordance with the sample collection protocols established in the TAHPR and/or EPA regulation 40 CFR 763, the Asbestos Hazard Emergency Response Act (AHERA). A summary of survey activities is provided below.

3.1 Visual Assessment

Our survey activities began with visual observation of the interior and exterior areas of the fire damaged apartment building on the site to identify homogeneous areas of suspect ACM. A homogeneous area consists of building materials that appear similar throughout in terms of color, texture and date of application. An interior assessment was conducted throughout visually accessible areas of the building. Building materials identified as concrete, glass, wood, masonry, metal or rubber were not considered suspect ACM.

3.2 Physical Assessment

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the EPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

3.3 Sample Collection

Based on results of the visual observation, bulk samples of suspect ACM were collected in general accordance with AHERA and TAHPR sampling protocols. Random samples of suspect materials were collected in each homogeneous area. The sample team members collected bulk samples using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker.

Thirty-six (36) bulk samples were collected from twelve (12) homogeneous areas of suspect ACM. A summary of suspect ACM samples collected during the survey is included as Appendix A.

3.4 Sample Analysis

Bulk suspect asbestos samples were submitted under chain of custody to Omni Environmental, Inc. of Round Rock, Texas for analysis by PLM with dispersion staining techniques per EPA's Method for the Determination of Asbestos in Bulk Building Materials (600/R-93-116). The percentage of asbestos, where applicable, was determined by microscopical visual estimation. Omni Environmental, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP Accreditation No. 102061-0) and licensed by the TDSHS (License Number 30-0087). Reports of laboratory analysis of all suspect asbestos samples collected and sample chain-of-custody documentation are included in Appendix C.

4.0 REGULATORY OVERVIEW

The State of Texas has established the Texas Asbestos Health Protection Rules (TAHPR) which requires any asbestos-related activity to be performed by an individual licensed by the State of Texas, through the TDSHS. An asbestos related activity consists of the disturbance (whether intentional or unintentional), removal, encapsulation, or enclosure of asbestos, including preparations or final clearance, the performance of asbestos surveys, the development of management plans and response actions, asbestos project design, the collection or analysis of asbestos samples, monitoring for airborne asbestos, bidding for a contract for any of these activities, or any other activity required to be licensed under TAHPR.

Abatement must be performed by a State of Texas licensed asbestos abatement contractor in accordance with a project design prepared by a State of Texas licensed asbestos consultant. In addition, third party air monitoring must be conducted during the abatement activities.

The asbestos NESHAP (40 CFR Part 61 Subpart M) regulates asbestos fiber emission and asbestos waste disposal practices. It also requires the identification and classification of existing building materials prior to demolition or renovation activity. Under NESHAP, asbestos containing building materials are classified as either friable, Category I non-friable or Category II non-friable ACM. Friable materials are those that, when dry, may be crumbled, pulverized or

reduced to powder by hand pressure. Category I non-friable ACM includes packing, gaskets, resilient floor coverings and asphalt roofing products containing more than 1% asbestos. Category II non-friable ACM are any materials other than Category I materials that contain more than 1% asbestos.

Friable ACM, Category I and II non-friable ACM in poor condition and has become friable or which will be subject to drilling, sanding, grinding, cutting, or abrading and which could be crushed or pulverized during anticipated renovation or demolition activities are considered regulated ACM (RACM). RACM must be removed prior to renovation or demolition activities.

The TAHPR and NESHAP require that written notification be submitted before beginning renovation or demolition projects which include the disturbance of any asbestos-containing material (ACM) in a building or facility, or before the demolition of a building or facility, even when no asbestos is present. This written notification must be provided to the TDSHS at least 10 working days prior to the commencement of asbestos abatement or demolition activities. Removal of RACM must be conducted by a State of Texas licensed asbestos contractor. In addition, third party air monitoring must be performed during the abatement.

The Occupational Safety and Health Administration (OSHA) Asbestos standard for the construction industry (29 CFR 1926.1101) regulates workplace exposure to asbestos. The OSHA standard requires employee exposure to airborne asbestos fibers be maintained below 0.1 asbestos fibers per cubic centimeter of air (0.1 f/cc). The OSHA standard classifies construction and maintenance activities which could disturb ACM and specifies work practices and precautions which employers must follow when engaging in each class of regulated work.

5.0 FINDINGS AND RECOMMENDATIONS

One (1) homogeneous materials sampled and analyzed as part of this survey were found to contain asbestos.

- Resilient Floor Tile and Associated Mastic Materials - The 1' x 1', tan with black mastic materials utilized throughout Units 830 and 832 were found to contain 2%-5% Chrysotile asbestos. The asbestos-containing flooring materials identified were noted to be in a damaged condition and were assessed as being non-friable. It is estimated that there exists approximately 1,750 square feet of these materials in the above listed areas.

None of the other suspect building materials sampled and analyzed were found to contain asbestos.

Asbestos Survey Report

T.L. Shaley Apartments – 830 and 832 Rita Avenue ■ San Antonio, Texas
July 27, 2017 ■ Terracon Project No. 90177369



It should be noted that suspect materials, other than those identified during the July 10, 2017, survey may exist within the building. Should suspect materials other than those which were identified during this survey be uncovered prior to or during the renovation process, those materials should be assumed asbestos-containing until sampling and analysis can confirm or deny their asbestos content.

A summary of the classification, condition and approximate quantity of confirmed ACM are presented in Appendix B. Laboratory analytical reports are included in Appendix C.

If the Client does not intend to renovate or demolish the building, the asbestos-containing materials associated with the building, should be managed in place. This in-place management should include such operations as repairing any damaged materials, protecting the remaining asbestos-containing materials from further damage, and developing a plan to periodically monitor the condition of the asbestos-containing materials. Notification of the presence of the materials should also be made to residents, employees and outside contractors so that they do not inadvertently disturb the remaining asbestos-containing materials.

If repair, renovation or demolition operations which may disturb the asbestos-containing materials are planned, it is recommended that the affected materials be removed. The TDSHS TAHPR require that any removal of asbestos-containing materials associated with the structure be conducted by trained and licensed asbestos abatement personnel.

According to the TDSHS TAHPR, a removal project involving the removal of more than 160 square feet or 260 linear feet of non-friable asbestos-containing materials would need to be designed by a licensed Individual Asbestos Consultant. Air monitoring by a licensed third-party Air Monitor would be required during the actual removal work regardless of the size of the project. Terracon would be pleased to provide a proposal to provide these services.

It is important to note the TAHPR and NESHAP require that written notification be submitted before beginning renovation or demolition projects which include the disturbance of any asbestos-containing material (ACM) in a building or facility, or before the demolition of a building or facility, even when no asbestos is present. This written notification must be provided to the TDSHS at least 10 working days prior to the commencement of asbestos abatement or demolition activities. These activities must be performed in accordance with the current TDSHS, EPA, and OSHA guidelines.

6.0 GENERAL COMMENTS

This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey of the suite. The information contained in this report is relevant to the date on which this survey was performed, and should not be relied upon to represent conditions at a later date.

Asbestos Survey Report

T.L. Shaley Apartments – 830 and 832 Rita Avenue ■ San Antonio, Texas
July 27, 2017 ■ Terracon Project No. 90177369



This report has been prepared on behalf of and exclusively for use by the San Antonio Housing Authority for specific application to their project as discussed.

This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

APPENDIX A

ASBESTOS SURVEY SAMPLE SUMMARY

**APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY**

**T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas
Terracon Project No. 90177369**

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
A-01	Drywall Construction – White with Popcorn Texture	Utilized on the ceilings throughout Units 830 & 832	Unit 832, Bedroom #1 – Central	No Asbestos Detected
A-02	Drywall Construction – White with Popcorn Texture	Utilized on the ceilings throughout Units 830 & 832	Unit 832, Dining Room – Central	No Asbestos Detected
A-03	Drywall Construction – White with Popcorn Texture	Utilized on the ceilings throughout Units 830 & 832	Unit 832, Living Room – Central	No Asbestos Detected
A-04	Drywall Construction – White with a Bumpy Texture	Utilized on the walls throughout Units 830 & 832	Unit 832, Bedroom #2 – Southeast	No Asbestos Detected
A-05	Drywall Construction – White with a Bumpy Texture	Utilized on the walls throughout Units 830 & 832	Unit 832, Bedroom #1 – Northeast	No Asbestos Detected
A-06	Drywall Construction – White with a Bumpy Texture	Utilized on the walls throughout Units 830 & 832	Unit 832, Dining Room – Northeast	No Asbestos Detected
A-07	Resilient Floor Tile – 1’ x 1’, Tan with Black Mastic	Utilized as flooring throughout Units 830 & 832	Unit 832 - Hallway by Restroom	2% - 5% Chrysotile
A-08	Resilient Floor Tile – 1’ x 1’, Tan with Black Mastic	Utilized as flooring throughout Units 830 & 832	Unit 832 - Hallway by Restroom	2% - 5% Chrysotile
A-09	Resilient Floor Tile – 1’ x 1’, Tan with Black Mastic	Utilized as flooring throughout Units 830 & 832	Unit 832 - Hallway by Restroom	2% - 5% Chrysotile
A-10	Cove Base – Tan with White Mastic	Utilized along the bottom of the walls in Units 830 & 832	Unit 832 - Hallway by Restroom	No Asbestos Detected
A-11	Cove Base – Tan with White Mastic	Utilized along the bottom of the walls in Units 830 & 832	Unit 832 - Hallway by Restroom	No Asbestos Detected
A-12	Cove Base – Tan with White Mastic	Utilized along the bottom of the walls in Units 830 & 832	Unit 832 - Hallway by Restroom	No Asbestos Detected
A-13	Ceramic Tile Grout – White	Utilized between ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected

**APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY**

**T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas
Terracon Project No. 90177369**

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
A-14	Ceramic Wall Tile Grout – White	Utilized between ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected
A-15	Ceramic Wall Tile Grout – White	Utilized between ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected
A-16	Ceramic Wall Tile Mortar – Gray	Utilized behind ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected
A-17	Ceramic Wall Tile Mortar – Gray	Utilized behind ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected
A-18	Ceramic Wall Tile Mortar – Gray	Utilized behind ceramic tile on walls in restrooms of Units 830 & 832	Unit 832, Restroom – Northeast	No Asbestos Detected
A-19	Sink Mastic – White	Utilized beneath sinks in Kitchens of Units 830 & 832	Unit 832 – Kitchen Sink	No Asbestos Detected
A-20	Sink Mastic – White	Utilized beneath sinks in Kitchens of Units 830 & 832	Unit 832 – Kitchen Sink	No Asbestos Detected
A-21	Sink Mastic – White	Utilized beneath sinks in Kitchens of Units 830 & 832	Unit 832 – Kitchen Sink	No Asbestos Detected
A-22	Insulation – Yellow	Utilized within the walls of Units 830 & 832	Unit 832 – Above Living Room Window	No Asbestos Detected
A-23	Insulation – Yellow	Utilized within the walls of Units 830 & 832	Unit 832 – Above Living Room Window	No Asbestos Detected
A-24	Insulation – Yellow	Utilized within the walls of Units 830 & 832	Unit 832 – Above Living Room Window	No Asbestos Detected
A-25	Insulation – Green with Black Paper	Utilized behind exterior brick walls of Units 830 & 832	Unit 832 – By Main Door	No Asbestos Detected
A-26	Insulation – Green with Black Paper	Utilized behind exterior brick walls of Units 830 & 832	Unit 832 – By Main Door	No Asbestos Detected
A-27	Insulation – Green with Black Paper	Utilized behind exterior brick walls of Units 830 & 832	Unit 832 – By Main Door	No Asbestos Detected

**APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY**

**T.L. Shaley Apartments
830 and 832 Rita Avenue
San Antonio, Texas
Terracon Project No. 90177369**

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
A-28	Roof Shingle – Brown with Black Felt Paper	Utilized as field of roof of Units 830 & 832	On Ground between Units 830 & 832	No Asbestos Detected
A-29	Roof Shingle – Brown with Black Felt Paper	Utilized as field of roof of Units 830 & 832	On Ground between Units 830 & 832	No Asbestos Detected
A-30	Roof Shingle – Brown with Black Felt Paper	Utilized as field of roof of Units 830 & 832	On Ground between Units 830 & 832	No Asbestos Detected
A-31	Caulking – White	Utilized around exterior windows and door frames of Units 830 & 832	Unit 832, Living Room Window – East	No Asbestos Detected
A-32	Caulking – White	Utilized around exterior windows and door frames of Units 830 & 832	Unit 832, Main Door – West	No Asbestos Detected
A-33	Caulking – White	Utilized around exterior windows and door frames of Units 830 & 832	Unit 832, Main Door – East	No Asbestos Detected
A-34	Moisture Barrier – Black on Foil	Utilized behind exterior brick walls of Units 830 & 832	Unit 832, by Main Door	No Asbestos Detected
A-35	Moisture Barrier – Black on Foil	Utilized behind exterior brick walls of Units 830 & 832	Unit 832, by Main Door	No Asbestos Detected
A-36	Moisture Barrier – Black on Foil	Utilized behind exterior brick walls of Units 830 & 832	Unit 832, by Main Door	No Asbestos Detected

APPENDIX B
CONFIRMED ASBESTOS-CONTAINING MATERIALS

APPENDIX B
CONFIRMED ASBESTOS-CONTAINING MATERIALS
T.L. Shaley Apartments
830 & 832 Rita Avenue
San Antonio, Texas
Terracon Project No. 90177369

SAMPLE NO.	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	PERCENT / TYPE ASBESTOS	NESHAP CLASSIFICATION	MATERIAL CONDITION	ESTIMATED QUANTITY
A-07, 08 & 09	Resilient Floor Tile – 1' x 1', Tan with Black Mastic	Utilized as flooring throughout the Units 830 & 832	2% - 5% Chrysotile	Category I Non-Friable	Damaged	1,750 Sq. Ft.

Sq. Ft. = Square Feet

Category I: Includes asbestos-containing packings, gaskets, asphaltic roofing products, resilient flooring and associated mastics.

Category II: Includes any non-friable asbestos-containing material not categorized as Category I.

Regulated Asbestos-containing Material (RACM): Friable asbestos-containing materials and/or Category I and II non-friable asbestos-containing materials which have a high probability of or have become friable by forces expected to be exerted in the course of a renovation or demolition process.

APPENDIX C
ASBESTOS ANALYTICAL LABORATORY REPORTS

SAMPLE SUMMARY REPORT

Omni Environmental, Inc.

2851 Joe DiMaggio Blvd Suite 10

Round Rock, TX 78665

(512) 258-9114

NVLAP LABCODE 102061.0

TDSHS Lab License 30-0087

Client Name: Terracon Consultants, Inc. San Antonio Contact Name: Warren Dean

Client Project Number: 90177369 Shaley Apt. 830 & 832 Lab Project #: 226172

Client Sample Number	Lab Sample Number	Asbestos Type and %	Asbestos Content by Layer		
A-01	727968	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
A-02	727969	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	
A-03	727970	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
A-04	727971	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
A-05	727972	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
A-06	727973	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
A-07	727974	Chry 2%	2% Chrysotile detected in Floor Tile	5% Chrysotile detected in Tar	
A-08	727975	Chry 2%	2% Chrysotile detected in Floor Tile	5% Chrysotile detected in Tar	
A-09	727976	Chry 2%	2% Chrysotile detected in Floor Tile	5% Chrysotile detected in Tar	
A-10	727977	NAD			
A-11	727978	NAD			
A-12	727979	NAD			
A-13	727980	NAD			
A-14	727981	NAD			
A-15	727982	NAD			
A-16	727983	NAD			
A-17	727984	NAD			
A-18	727985	NAD			
A-19	727986	NAD			
A-20	727987	NAD			
A-21	727988	NAD			
A-22	727989	NAD			
A-23	727990	NAD			
A-24	727991	NAD			
A-25	727992	NAD			
A-26	727993	NAD			

This report is only a summary. For complete information on each sample see the Bulk Sample Analysis Report.

Note that NAD means that No Asbestos was Detected in the sample or layer.

SAMPLE SUMMARY REPORT

Omni Environmental, Inc.

2851 Joe DiMaggio Blvd Suite 10

Round Rock, TX 78665

(512) 258-9114

NVLAP LABCODE 102061.0

TDSHS Lab License 30-0087

Client Name: Terracon Consultants, Inc. San Antonio **Contact Name: Warren Dean**

Client Project Number: 90177369 Shaley Apt. 830 & 832 **Lab Project #: 226172**

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Asbestos Type and %</u>	<u>Asbestos Content by Layer</u>
A-27	727994	NAD	
A-28	727995	NAD	
A-29	727996	NAD	
A-30	727997	NAD	
A-31	727998	NAD	
A-32	727999	NAD	
A-33	728000	NAD	
A-34	728001	NAD	
A-35	728002	NAD	
A-36	728003	NAD	

This report is only a summary. For complete information on each sample see the Bulk Sample Analysis Report.
Note that NAD means that No Asbestos was Detected in the sample or layer.

BULK SAMPLE ANALYSIS REPORT

Omni Environmental, Inc.

2851 Joe DiMaggio Blvd Suite 10

Round Rock, TX 78665

(512) 258-9114

NVLAP LABCODE 102061.0

TDSHS Lab License 30-0087

July 15, 2017

Warren Dean

Terracon Consultants, Inc. San Antonio

6911 Blanco Road

San Antonio, TX 78216

Dear Mr. Dean:

Please find enclosed the bulk sample analytical results for the following project:

Client Project #:	90177369 Shaley Apt. 830 & 832	Lab Project #:	226172
Date Received:	7/11/2017	Received By:	Steve Griffin
Delivery Agency:	Federal Express	Name/Tracking #:	6707 4424 2264
Date Logged:	7/13/2017	Logged in by:	Linda Griffin
Analysis Completed:	7/15/2017	Samples in Project:	36

The following procedures were used in sample analysis unless otherwise noted.

ANALYTICAL METHOD: EPA Method for the Determination of Asbestos in Bulk Building Materials (EPA 600/R-93/116) or EPA Interim Method for the Determination of Asbestos in Bulk Insulation Samples (EPA 600/M4-82-020), as applicable.

Percentages are visual estimates based on sample volume. Limit of Detection: <1%. Limit of Quantification: 1%.

Negative results of resinously bound materials such as roofing material or floor tile may be inconclusive. NAD means No Asbestos was Detected in the sample or layer. The term texturizer (where applicable) may include wall texturizing, tape and bed, and/or joint compound. This report relates only to the item tested. It may not be used to claim product endorsement by NVLAP or any agency of the federal government. This report may not be reproduced, except in full, without the expressed written consent of laboratory management. Subsamples of layers or other inhomogeneities were analyzed separately and their results combined in proportion to the quantity of each layer to obtain quantitative results for the sample as a whole. All samples are stored for 1 month from the original analysis date before being disposed of.

Property of Terracon

Please call us if you have any questions regarding this report

Thank you for your business.

Sincerely,



Steve Griffin, Lab Manager

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727968 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-01 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	20 %
Amosite				Paint	40 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226172 Lab Sample #: 727969 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-02 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	20 %
Amosite				Paint	40 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.

Lab Project #: 226172 Lab Sample #: 727970 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-03 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	20 %
Amosite				Paint	40 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727971 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-04 Date Analyzed: 7/15/2017
Analyst: Steve Griffin QC'd By: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	48 %
Amosite		Fibrous Glass	10 %	Styrofoam	2 %
Crocidolite				Paint	10 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226172 Lab Sample #: 727972 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-05 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	48 %
Amosite		Fibrous Glass	10 %	Styrofoam	2 %
Crocidolite				Paint	10 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226172 Lab Sample #: 727973 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Heterogeneous, Fibrous
Client Sample #: A-06 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	48 %
Amosite		Fibrous Glass	10 %	Styrofoam	2 %
Crocidolite				Paint	10 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727974 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-07 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	2 %		Filler/Binder	61 %
Amosite			Tar	2 %
Crocidolite			Aggregate	35 %
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total:	2 %	Fibrous Total:	Non-Fibrous Total:	98 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Floor Tile.
Layer 2: 5% Chrysotile detected in Tar.

Lab Project #: 226172 Lab Sample #: 727975 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-08 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	2 %		Filler/Binder	61 %
Amosite			Tar	2 %
Crocidolite			Aggregate	35 %
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total:	2 %	Fibrous Total:	Non-Fibrous Total:	98 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Floor Tile.
Layer 2: 5% Chrysotile detected in Tar.

Lab Project #: 226172 Lab Sample #: 727976 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-09 Date Analyzed: 7/15/2017
Analyst: Steve Griffin QC'd By: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	2 %		Filler/Binder	61 %
Amosite			Tar	2 %
Crocidolite			Aggregate	35 %
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total:	2 %	Fibrous Total:	Non-Fibrous Total:	98 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Floor Tile.
Layer 2: 5% Chrysotile detected in Tar.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727977 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-10 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 100 %
Amosite		Mastic <1 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727978 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-11 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 100 %
Amosite		Mastic <1 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727979 Color: Tan
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-12 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 100 %
Amosite		Mastic <1 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727980 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-13 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite					
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727981 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-14 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite					
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727982 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-15 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite					
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727983 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-16 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 60 %
Amosite		Aggregate 40 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727984 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-17 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 60 %
Amosite		Aggregate 40 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727985 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-18 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 60 %
Amosite		Aggregate 40 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727986 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-19 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>		
Chrysotile	Cellulose	10 %	Filler/Binder	90 %
Amosite				
Crocidolite				
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total: NAD	Fibrous Total:	10 %	Non-Fibrous Total:	90 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727987 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-20 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>		
Chrysotile	Cellulose	10 %	Filler/Binder	90 %
Amosite				
Crocidolite				
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total: NAD	Fibrous Total:	10 %	Non-Fibrous Total:	90 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727988 Color: White
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-21 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>		
Chrysotile	Cellulose	10 %	Filler/Binder	90 %
Amosite				
Crocidolite				
Tremolite				
Actinolite				
Anthophyllite				
Asbestos Total: NAD	Fibrous Total:	10 %	Non-Fibrous Total:	90 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727989 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-22 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Fibrous Glass	97 %	Filler/Binder 3 %
Amosite			
Crocidolite			
Tremolite			
Actinolite			
Anthophyllite			
Asbestos Total: NAD	Fibrous Total: 97 %		Non-Fibrous Total: 3 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727990 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-23 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Fibrous Glass	97 %	Filler/Binder 3 %
Amosite			
Crocidolite			
Tremolite			
Actinolite			
Anthophyllite			
Asbestos Total: NAD	Fibrous Total: 97 %		Non-Fibrous Total: 3 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727991 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-24 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Fibrous Glass	97 %	Filler/Binder 3 %
Amosite			
Crocidolite			
Tremolite			
Actinolite			
Anthophyllite			
Asbestos Total: NAD	Fibrous Total: 97 %		Non-Fibrous Total: 3 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727992 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-25 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder 5 %
Amosite	Fibrous Glass 50 %	
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 95 %	Non-Fibrous Total: 5 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727993 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-26 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder 5 %
Amosite	Fibrous Glass 50 %	
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 95 %	Non-Fibrous Total: 5 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727994 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-27 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder 5 %
Amosite	Fibrous Glass 50 %	
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 95 %	Non-Fibrous Total: 5 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727995 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-28 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 20 %	Filler/Binder
Amosite	Fibrous Glass 25 %	Tar 50 %
Crocidolite		Aggregate 5 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727996 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-29 Date Analyzed: 7/15/2017
Analyst: Steve Griffin QC'd By: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 20 %	Filler/Binder
Amosite	Fibrous Glass 25 %	Tar 50 %
Crocidolite		Aggregate 5 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727997 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-30 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 20 %	Filler/Binder
Amosite	Fibrous Glass 25 %	Tar 50 %
Crocidolite		Aggregate 5 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 727998 Color: Gray
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-31 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite				Aggregate	<1 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 727999 Color: Gray
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-32 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite				Aggregate	<1 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 728000 Color: Gray
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Non-Fibrous
Client Sample #: A-33 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	<1 %	Filler/Binder	100 %
Amosite				Aggregate	<1 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	<1 %	Non-Fibrous Total:	100 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226172 Lab Sample #: 728001 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-34 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder
Amosite		Tar 45 %
Crocidolite		Metal 10 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 728002 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-35 Date Analyzed: 7/15/2017
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder
Amosite		Tar 45 %
Crocidolite		Metal 10 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS

Lab Project #: 226172 Lab Sample #: 728003 Color: Black
Client Project #: 90177369 Shaley Apt. 830 & 832 Characterization: Homogeneous, Fibrous
Client Sample #: A-36 Date Analyzed: 7/15/2017
Analyst: Steve Griffin QC'd By: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 45 %	Filler/Binder
Amosite		Tar 45 %
Crocidolite		Metal 10 %
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 45 %	Non-Fibrous Total: 55 %

SAMPLE LAYER DETAILS


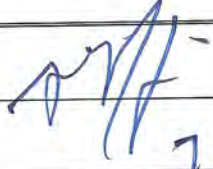
Terracon

BULK ASBESTOS CHAIN OF CUSTODY

LABORATORY INFORMATION	CLIENT INFORMATION
Omni Environmental, Inc. 2851 Joe DiMaggio Blvd Suite 10 Round Rock, Texas 78665 Phone: (512) 258-9114	Terracon Consultants, Inc. 6911 Blanco Road San Antonio, Texas 78216 Phone: (210) 641-2112 Facsimile: (210) 641-2124

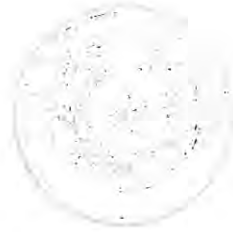
PROJECT INFORMATION	
Contact Person	Warren P. Dean
Email Address	wpdean@terracon.com / wcdeveau@terracon.com
Project Number	90177369
Project Name	TL Shaley Apartments – 830 & 832
Total Number of Samples	36

SAMPLE IDENTIFICATION	REQUESTED ANALYSIS	TURNAROUND TIME
A - 01 to A - 36	PLM	Standard

Relinquished By:		Received By:	
Date:	7/10/17	Date:	7/11/17
Time:	1441	Time:	1030
Relinquished By:		Received By:	
Date:		Date:	7/11/17
Time:		Time:	1030

Project 226172

APPENDIX D
LICENSES AND CERTIFICATIONS



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

TERRACON CONSULTANTS INC

is certified to perform as a

Asbestos Consultant Agency

in the State of Texas within the purview of Texas Occupations Code, chapter 1954, so long as this license is not suspended or revoked and is renewed according to the rules adopted by the Texas Board of Health.

A handwritten signature in black ink, appearing to read "John Hellerstedt", followed by a horizontal line.

JOHN HELLERSTEDT, M.D.
COMMISSIONER OF HEALTH

License Number: 100157

Control Number: 96944

Expiration Date: 11/30/2018

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE



STATE DEPARTMENT OF STATE

Health Services

Asbestos Inspector

WARREN P DEAN

License No. 603403

Control No. 98486

Expiration Date: 2/23/2019





Texas Department of State Health Services

Asbestos Individual Consultant

MITCHELL W STOGNER

License No. 105648

Control No. 96925

Expiration Date: 12/26/2017





TEXAS DEPARTMENT OF STATE HEALTH SERVICES

OMNI ENVIRONMENTAL INC

is certified to perform as a

Asbestos Laboratory PLM

in the State of Texas within the purview of Texas Occupations Code, chapter 1954, so long as this license is not suspended or revoked and is renewed according to the rules adopted by the Texas Board of Health.

A handwritten signature in cursive script, appearing to read "John Hellertstedt".

JOHN HELLERTSTEDT, M.D.
COMMISSIONER OF HEALTH

License Number: 300087

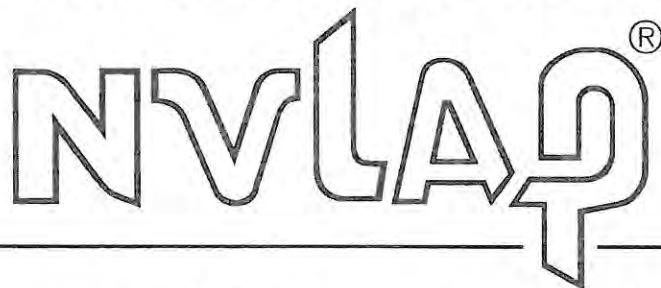
Control Number: 96203

Expiration Date: 6/15/2019

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 102061-0

Omni Environmental, Inc.
Round Rock, TX

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*


Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2017-07-01 through 2018-06-30

Effective Dates




For the National Voluntary Laboratory Accreditation Program

APPENDIX E
SAMPLE LOCATION DRAWING

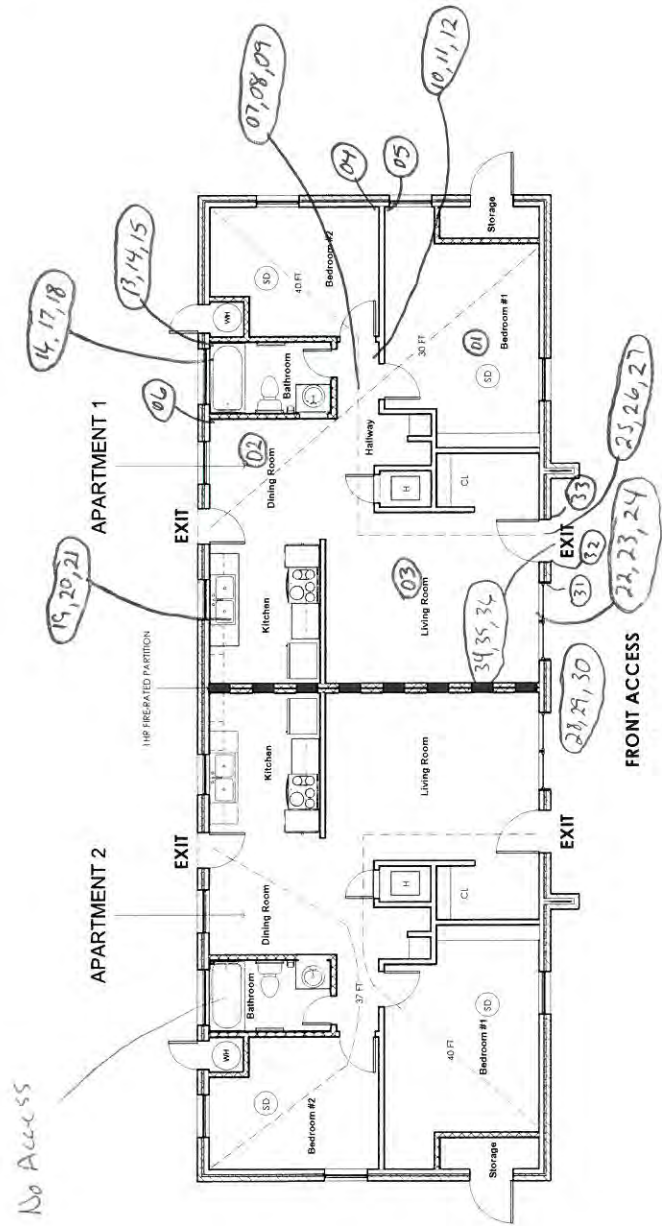
CODE NOTES

THE RESTORATION SCOPE OF WORK DOES NOT CHANGE BUILDING OCCUPANCY TYPE.

OCCUPANCY: RESIDENTIAL
 OCCUPANCY (CA)
 RESIDENTIAL: 200 SF PER OCCUPANT
 1707000-9 OCCUPANTS:
 1707000-9 OCCUPANTS:
 NUMBER OF UNITS: 2
 NUMBER OF UNITS: 2 PER UNIT
 EXIT REQUIREMENT: 32IN WIDE & 72IN FALL
 FIRE PROTECTION: 1 PER BEDROOM
 GAS DETECTORS:
 PAINTED WALLS
 ROOF
 GLAZING

FIRE SAFETY LEGEND

□ FIRE EXTINGUISHER CABINET
 --- ROUTE TO NEAREST EXIT
 (SD) SMOKE DETECTOR



1 Life Safety Plan
 1/8" = 1'-0"

SECTION 042613 - MASONRY VENEER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Clay face brick.

B. Products Installed but Not Furnished under This Section:

1. Steel lintels in masonry veneer.
2. Steel shelf angles for supporting masonry veneer.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type and color of brick and colored mortar.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type and size of product.

1.4 QUALITY ASSURANCE

A. Sample Panels: Provide sample brick units to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.

1.5 FIELD CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 BRICK

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: Facing brick complying with ASTM C 216 or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area)
 - 1. ACME Brick or approved equal.
 - 2. Grade SW.
 - 3. Type FBX or Type HBX.
 - 4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.
 - 5. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 - 6. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing according to ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet or shall have a history of successful use in Project's area.
 - 7. Size (Actual Dimensions): Match existing two types and sizes of brick.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91/C 91M.
- E. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- F. Water: Potable.

2.3 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
 - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
 - 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
- C. Adjustable Masonry-Veneer Anchors:
 - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
 - 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.075-inch-thick steel sheet, galvanized after fabrication.
 - 3. Fabricate wire ties from 0.187-inch- diameter, hot-dip galvanized-steel wire unless otherwise indicated.
 - 4. Fabricate wire connector sections from 0.187-inch- diameter, hot-dip galvanized, carbon-steel wire.
 - 5. Contractor's Option: Unless otherwise indicated, provide any of the adjustable masonry-veneer anchors specified.
 - 6. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with a projecting vertical tab having a slotted hole for inserting wire tie.
 - a. FERRO Corp.; Hohmann & Barnard, Inc.
 - 7. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with projecting tabs having holes for inserting vertical legs of wire tie formed to fit anchor section.
 - a. Heckmann Bldg. Prod.; Hohmann & Barnard, Inc.; Wire-Bond.

2.4 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
 - 1. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 - 2. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
- B. Flexible Flashing: Use one of the following unless otherwise indicated:
 - a.

2. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch.
 - a. DuPont Bldg.; GCP Applied Techno.; Protecto Wrap; Raven Industries.
- C. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Weep/Vent Products: Use one of the following unless otherwise indicated:
 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Advance Building Products; Heckmann Building Products; Wire-Bond
 2. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.
 - a. Advanced Building Products; Keene Building Products; Mortar Net Solutions
 3. Vinyl Weep Hole/Vent: Units made from flexible PVC, designed to fit into a head joint and consisting of a louvered vertical leg, flexible wings to seal against ends of masonry units, and a top flap to keep mortar out of the head joint; in color selected by Architect.
 - a. Hohmann and Barnard Inc.; Williams Products; Wire-Bond.
- C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
 1. Advanced building Products; Mortar Net Solutions; Wire-Bond
 2. Configuration: Provide one of the following:
 - a. Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.

2.6 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 1. Diedrick Techno.; EaCo Chem; Proscow, Inc.

2.7 MORTAR MIXES

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

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- C. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.2 TOLERANCES

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

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.4 MORTAR BEDDING AND JOINTING

- A. Lay masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.5 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing to comply with the following requirements:
 1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 25 inches o.c. horizontally, with not less than one anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.
 4. Space anchors as indicated, but not more than 18 inches o.c. vertically and horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 24 inches, around perimeter.
- B. Provide not less than 1 inch of airspace between back of masonry veneer and face of sheathing.

3.6 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 - 3. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal drip edge.
 - 4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install weep holes in veneers in head joints of first course of masonry immediately above embedded flashing.
 - 1. Use specified weep/vent products to form weep holes.
 - 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- D. Place cavity drainage material in airspace behind veneers to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- E. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.
 - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

3.7 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Special inspections according to Level B in TMS 402/ACI 530/ASCE 5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
- C. Testing Prior to Construction: One set of tests.
- D. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.

- E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

3.8 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
 2. Protect adjacent stone and nonmasonry surfaces from contact with cleaner.
 3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 4. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.9 MASONRY WASTE DISPOSAL

- A. Excess Masonry Waste: Remove excess clean masonry waste and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042613

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Miscellaneous steel framing and supports.
 - 2. Shelf angles.
 - 3. Miscellaneous steel trim.
 - 4. Loose bearing and leveling plates.
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Loose steel lintels.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paint products.
 - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS

2.1 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, ambient; 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting." Section 099123 Interior Painting."
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.

- E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.6 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c., unless otherwise indicated.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.

2.7 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Galvanize loose steel lintels located in exterior walls.
- C. Prime loose steel lintels located in exterior walls with zinc-rich primer.

2.8 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.

2.9 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer primers specified in Section 099113 "Exterior Painting."

- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." SSPC-SP 3, "Power Tool Cleaning," requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 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 nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 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/A 780M.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Framing with dimension lumber.
 - 2. Wood blocking and nailers.
 - 3. Wood furring and grounds.
 - 4. Wood sleepers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Post-installed anchors.

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, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 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 ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- 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.
- D. Application: Treat all rough carpentry unless otherwise indicated and items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.
 - 1. Application: All interior partitions.
 - 2. Species:
 - a. Southern pine or mixed southern pine; SPIB.
 - b. Northern species; NLGA.
 - c. Eastern softwoods; NeLMA.
 - d. Western woods; WCLIB or WWPA.
- B. Framing Other Than Non-Load-Bearing Partitions: No. 2 grade.
 - 1. Application: Framing other than interior partitions.
 - 2. Species:
 - a. Hem-fir (north); NLGA.
 - b. Southern pine; SPIB.
 - c. Douglas fir-larch; WCLIB or WWPA.
 - d. Southern pine or mixed southern pine; SPIB.
 - e. Spruce-pine-fir; NLGA.
 - f. Douglas fir-south; WWPA.
 - g. Hem-fir; WCLIB or WWPA.
 - h. Douglas fir-larch (north); NLGA.
 - i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

- C. Framing Other Than Non-Load-Bearing Partitions: Any species and grade with a modulus of elasticity of at least 1,500,000 psi and an extreme fiber stress in bending of at least 1000 psi for 2-inch nominal thickness and 12-inch nominal width for single-member use.
 - 1. Application: Framing other than interior partitions.
- D. Exposed Framing: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
 - 1. Species and Grade: As indicated above for load-bearing construction of same type.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Cants.
 - 4. Furring.
 - 5. Grounds.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.
- C. Concealed Boards: 15 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
 - 2. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.5 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall 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: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

2.6 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Comply with AWWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Composite nail base insulated roof sheathing.
4. Underlayment.

B. Related Section:

1. See Structural Drawings for Shear Wall Sheathing Specifications.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preserved-treated plywood.
2. Foam-plastic sheathing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 WOOD PANEL PRODUCTS

- A. Emissions:** Products shall meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process:** AWWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground.

- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated

2.4 WALL SHEATHING

- A. Plywood Sheathing: DOC PS 1, Either DOC PS 1 or DOC PS 2, Exterior, Structural I sheathing.
- B. Cementitious Backer Units: ASTM C 1325, Type A.
 - 1. C-Cure; USG Corp.; Custom Bldg. Products
 - 2. Thickness: 5/8 inch.

2.5 ROOF SHEATHING

- A. Plywood Sheathing: DOC PS 1, Exterior, Structural I sheathing.

2.6 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING

- A. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C 1289, Type V with DOC PS 2, Exposure 1 oriented strand board on one face.
 - 1. Polyisocyanurate-Foam Thickness: as indicated on Drawings.
 - 2. Oriented-Strand-Board Nominal Thickness: 7/16 inch.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2.8 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01, ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.
- D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Wall and Roof Sheathing:
 - a. Nail, Nail or staple to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
 - b. Space panels 1/8 inch apart at edges and ends.

3.3 CEMENTITIOUS BACKER UNIT INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 FOAM-PLASTIC SHEATHING INSTALLATION

- A. Comply with manufacturer's written instructions.

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- B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.
- C. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

END OF SECTION 061600

SECTION 061610 - SOUND BARRIER WALL SHEATHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Section 060000 Wood, Plastics and Composites.

1.2 RELATED SECTIONS

- A. Section 061053 – Rough Carpentry: Installation and requirements for wood substrates and structure.
- B. Section 092900 –Gypsum Board: Installation and requirements for wall assemblies.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM C 209 - Test Methods for Cellulosic Fiber Insulating Board.
 2. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 3. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.
 4. UL listed, File R16381.
 5. Forest Stewardship Certification (FSC): CoC Cert no. 5682.
 6. ICC-ES Report ESR-1374.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 10 years' experience in producing sound-deadening boards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with labels intact until ready for installation.

- B. Inspect the materials upon delivery to assure that specified products have been received. Report damaged material immediately to the delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Store materials in a dry place, indoors, on raised platform protected from weather damage.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Climatize panels to existing moisture conditions and for not less than 24 hours before installation. Comply with manufacturer's recommendations for acclimatization.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Basis of Design: Homasote Company; 932 Lower Ferry Road, West Trenton, NJ 08628. Tel: (800) 257-9491. Tel: (609) 883-3300. Fax: (609) 883-3497. Email: sales@homasote.com Website: www.homasote.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 012500.
- C. Provide all acoustical wall panels from a single manufacturer.

2.2 MATERIALS

- A. 440 SoundBarrier: Class C fire-rated. Molded, recycled post-consumer paper, cellulose fiber structural panel. Physical properties as follows:
 - 1. Thickness: 1/2 inch (As indicated on drawings).
 - 2. Density: 26-28 pcf (416-448 kg/cu. m) tested in accordance with ASTM C 209.
 - 3. Tensile Strength: When tested in accordance with ASTM C 209:
 - a. Parallel: 450-700 psi (3,100-4,830 kPa).
 - b. Transverse: 750-1000 psi (5.1171-6.894 kPa).
 - 4. Hardness (Janka Ball): 230 lbs (104 kg) tested in accordance with ASTM D 1037.
 - 5. Water Absorption by Volume: When tested in accordance with ASTM C 209:
 - a. 2 hour immersion: 7 percent maximum.
 - 6. Expansion: 50 to 90 percent relative humidity, 0.25 percent in accordance with ASTM C 209.
 - 7. Thermal Resistance: When tested in accordance with ASTM C 209 per ASTM C 518:
 - a. R-value: 1.2 for 1/2 inch (13 mm) thick board.
 - b. K-value: .512 Btu-in/ (h ft² °F).

8. Noise reduction coefficient (NRC): 0.20
9. Flame Spread: 76 to 200 tested in accordance with ASTM E 84, Class III or C.

2.3 ACCESSORIES

- A. Adhesive: APA AFG-01 specification sub-floor adhesive.
- B. Wall Panel Fasteners:
 1. Nails, Wood Framing: Length required penetrating wood framing 3/4 inch (19 mm) minimum.
 2. Screws:
 - a. General: 20 gauge or heavier, self-tapping drywall type steel screw.
 - b. Wood Framing: Coarse thread drywall type wood screw, length as required to penetrate framing 3/4 inch (19 mm) minimum.
 - c. Metal Framing: 22-25 gauge, drywall type steel screw.
- C. Drywall fastener for decoupled wall installation.
 1. #10 drywall screw or laminating screw.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed.
- B. Verify framing member spacing complies with manufacturer's requirements depending on substrates and installation methods.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- D. Verify what environmental conditions are, and will continue to be maintained in accordance with manufacturer's recommendations.
- E. Starting work by installer is acceptance of substrate and environmental conditions.

3.2 PREPARATION

- A. Follow manufacturer's instructions by separating and allowing panels to be exposed to environmental temperature and humidity conditions for not less than 24 hours before start of installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install only clean dry panels. Do not install wet panels.
- C. Wall Panel Installation: Space panel joints 1/8 inch (3 mm) apart; 1/4 inch (6 mm) space at floors, ceilings, and window and door frames. Install gypsum wallboard or

other wall finish panels so that finish panel joints are staggered and do not coincide with sound barrier panel joints. Install in accordance with finish panel manufacturer's installation recommendations.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.5 CLEANING

- A. Comply with manufacturer's recommendations for repairing damaged panels.
- B. Replace panels that cannot be repaired.

END OF SECTION 061610

SECTION 062013 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior wood trim.
 - 2. Hardboard soffits.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.
- B. Samples: For each type of product involving selection of colors, profiles, or textures.

1.3 INFORMATIONAL SUBMITTALS

- A. Compliance Certificates:
 - 1. For lumber that is not marked with grade stamp.
 - 2. For preservative-treated wood that is not marked with treatment-quality mark.
- B. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated.
- B. Factory mark each piece of lumber with grade stamp of inspection agency, indicating grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber, mark grade stamp on end or back of each piece.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC3a or UC3b.
 - 1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19.

2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. Application: Where indicated. All exterior lumber.

2.3 EXTERIOR TRIM

- A. Lumber Trim:
 1. Species and Grade: Southern pine, pressure-preservative treated; B & B; SPIB.
 2. Maximum Moisture Content: 19 percent.
 3. Face Surface: Surfaced (smooth).
- B. Primed Hardboard Trim: ANSI A135.6, primed with manufacturer's standard exterior primer. Recommended by manufacturer for exterior use.

2.4 HARDBOARD SOFFITS

- A. Primed hardboard, complying with ANSI A135.6, with manufacturer's standard exterior primer.
 1. Type: 7/16-inch- thick flat panels, smooth.

2.5 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.
 1. For applications not otherwise indicated, provide hot-dip galvanized-steel fasteners.
- B. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.
- C. Insect Screening for Soffit Vents: Aluminum, 18-by-16-inch mesh.
- D. Continuous Soffit Vents: Aluminum hat channel shape with stamped louvers or perforations, 2 inches wide and in lengths not less than 96 inches.
 1. Net-Free Area: 4 sq. in./linear ft..
 2. Finish: Mill finish.
- E. Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and applicable requirements in Section 079200 "Joint Sealants" and recommended by sealant and substrate manufacturers for intended application.
 1. Pecora Corp.; Tremco Inc.; Bostik, Inc.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099113 "Exterior Painting."

3.2 INSTALLATION, GENERAL

- A. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Install stairs with no more than 3/16-inch variation between adjacent treads and risers and with no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

3.3 STANDING AND RUNNING TRIM INSTALLATION

- A. Install flat-grain lumber with bark side exposed to weather.
- B. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long, except where necessary.
 - 1. Use scarf joints for end-to-end joints.
 - 2. Stagger end joints in adjacent and related members.
- C. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints, with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

END OF SECTION 062013

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Polyisocyanurate foam-plastic board.
 - 2. Glass-fiber blanket.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Research reports.

PART 2 - PRODUCTS

2.1 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, Glass-Fiber-Mat Faced: ASTM C 1289, glass-fiber-mat faced, Type II, Class 2.
 - 1. Carlisle Castings; Atlas Roofing; Firestone Bldg. Products, RMAX, Inc.
 - 2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- B. Glass-Fiber Blanket, Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation).

2.3 ACCESSORIES

- A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
 2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.
- C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- D. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

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- a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft..

END OF SECTION 072100

**SECTION 072720 – NON-PROPRIETARY PERFORMANCE SPECIFICATION for VAPOR
PERMEABLE FLUID APPLIED AIR BARRIER ASSEMBLY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Materials and installation methods supplementing a one-component vapor permeable, liquid applied elastic air and water barrier.
- B. Materials and installation to bridge and seal the following air leakage pathways and gaps:
 - 1. Connections of the walls to the roof air barrier.
 - 2. Connections of the walls to the foundations.
 - 3. Expansion joints.
 - 4. Openings and penetrations of window frames.
 - 5. Door frames.
 - 6. Piping, conduit, duct and similar penetrations.
 - 7. Masonry ties, screws, bolts and similar penetrations.
 - 8. All other air leakage pathways in the building envelope.
 - 9. Sealing flashing to wall surface.

1.02 RELATED SECTIONS

- A. Section 042613 – Masonry Veneer
- B. Section 061600 – Sheathing
- C. Section 072419 – Water-Drainage Exterior Insulation and Finish System.
- D. Section 079200 – Joint Sealants

1.03 PERFORMANCE REFERENCES

- A. ASTM E 2178-01: Standard Test for Determining the Air Permeability of Building Materials.
- B. ASTM E 2357, Standard Test Method for Determining Air Leakage of Air Barrier Assembly.
- C. ASTM E283-91: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, and Doors Under Specified Pressure Differences Across the Specimen.
- D. CODE MANDATED ASTM E331: Standard Test Method for Structural Performance of Exterior Windows, and Doors by Uniform Static Air Pressure Difference.
- E. ASTM E96: Water Vapor Transmission of Materials, Procedure B
- F. AATCC 127 Water Resistance

- G. ASTM D 1970, Self Sealability
- H. ICC-ES AC212, Freeze Thaw, Crack Bridging
- I. CODE MANDATED Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.
- J. ASTM E84, Standard Test Method for Surface Burning

1.04 PERFORMANCE REQUIREMENTS

- A. Provide an air barrier system constructed to perform as a continuous elastic air barrier, and as a liquid water drainage plane flashed to discharge to the exterior any incidental condensation or water penetration. Membrane shall accommodate movements of building materials by providing expansion and control joints as required, with accessory air seal materials at such locations, changes in substrate and perimeter conditions.
 - 1. The air barrier shall have the following characteristics:
 - a. It must be continuous, with all joints made air-tight.
 - b. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent assembly, allowing for the relative movement of assembly due to thermal and moisture variations and creep. Connection shall be made between:
 - 1) Foundation and walls.
 - 2) Walls and windows or doors.
 - 3) Different wall assembly.
 - 4) Wall and roof.
 - 5) Wall and roof over unconditioned space.
 - 6) Walls, floor and roof across construction, control and expansion joints.
 - 7) Walls, floors and roof to utility, pipe and duct penetrations.
 - 8) Flashing to wall surface.
 - 2. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air-tight.
 - 3. Air Permeability: Maximum 0.04 cfm/sq.ft. @ 10.5 psf per ASTM E283.
 - 4. Air Permeability: @ delta P of 0.3 inch water...0.002 CFM/ft² per ASTM E 2178
 - 5. ASTM E 2357, Full Scale Wall Testing of the Air Barrier System
 - a. System Air Leakage, Requirement – 0.0008 CFM/ft² maximum
 - b. Penetration Check, Requirement – 0.00088 CFM/ft² maximum
 - 6. ASTM E96 Water Vapor Permeance:10-20 Perms per Procedure B
 - 7. ASTM E331, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference - 10 psf for 2 hours.
 - 8. Elongation: Minimum 50% per ASTM D412.
 - 9. AATC 127 Water Resistance – Pass
 - 10. ASTM D 1970 Self Sealability – Pass

11. ICC-ES AC212, Freeze Thaw, Crack Bridging – Pass
12. Fire Testing: Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.
13. ASTM E84 Class A Fire Resistant

1.05 SUBMITTALS

- A. Section 013300 – Submittal Procedures: Submittal Procedures.
- B. Prior to commencing the Work, submit manufacturer’s independent Laboratory Report for the Air Barrier Assembly testing on ASTM E 2357 tested on a steel stud frame wall, results are to be based on Specimen 2 testing only.
- C. Prior to commencing the Work, submit documentation certifying that the air barrier system has been tested independently, indicating compliance with the performance requirements of the Air Barrier Association of Association.
- D. Prior to commencing the Work, submit copies of manufacturers’ literature for the system, membrane, primers, sealants, adhesives and associated auxiliary materials shall be included as parts of the system that is listed by the Air Barrier Association of America evaluation.
- E. Prior to commencing the Work, submit references clearly indicating that the materials proposed have been installed for not less than three years on projects of similar scope and nature.
- F. Prior to commencing the Work, submit manufacturers’ complete set of standard details for air barrier/vapor retarders. The manufacturer’s representative shall review the contract drawings and note any modifications required to make the system air and water tight.

1.06 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide primary products, including each component of the air barrier membrane system, which has been commercially available for a minimum of 5 years.
- B. Submit in writing, a document stating that the applicator of the primary air barrier membrane specified in this section is recognized by the manufacturer as suitable for the execution of the Work.
- C. Perform Work in accordance with the printed requirements of the air barrier manufacturer and this specification.
- D. Maintain one copy of manufacturer instructions on site.
- E. At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the air barrier membrane manufacturer’s representative.

- F. Components used in this section shall be sourced from one manufacturer, including sheet membrane, air barrier sealants, primers, mastics, tapes and adhesives as listed as an evaluated air barrier assembly by the Air Barrier Association of America.

1.07 PRE-INSTALLATION CONFERENCE

- A. Convene four weeks prior to commencing work of this section, under provisions of Section 01 30 00 – Administrative Requirements: Pre-Installation Meeting. Attendance by the manufacturer’s representative along with the installer is **mandatory**.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- B. All pail goods shall bear the ABAA Evaluated Air Barrier label
- C. Store roll materials on end in original packaging.
- D. Keep all products stored at above 40°F. Apply to a substrate with a surface T°F of 40°F and rising.
- E. Protect rolls from direct sunlight until ready for use.
- F. Do not double stack pail goods.

1.09 COORDINATION

- A. Ensure continuity of the air seal throughout the scope of this section.

PART 2 PRODUCTS

2.01 MEMBRANES

- A. Liquid air barrier: One component elastomeric membrane, spray, trowel or brush applied, having the following characteristics and have passed all evaluations by the Air Barrier Association of America (ABAA) and be listed on their web site as having passed all the evaluations:
 - 1 Air Barrier Material permeability test:
 - a. Air Leakage per ASTM E 2178, dry film, delta P of 0.3 inches of water, 0.002 +/- 10%
 - 2 Air Barrier System Test on Full Scale Wall Assembly, ASTM E 2357
 - a. System Air Leakage, 0.0008 CFM/ft² +/- 10%
 - b. Penetrations Check, MUST PASS ASTM E 2357 requirements
 - 3. Water Vapor permeance: (704 ng/Pa.m².s.) 10 to 20 perms, ASTM E96 Method B. NOTE: **THE MATERIAL SPECIFIED IS VAPOR PERMEABLE.**

4. Elongation (ASTM D412: >50%)
 5. Low temperature flexibility and crack bridging: Pass – ICC-ES AC212
 6. ASTM D 1970, Self Sealability – Pass
 7. AATCC 127 Water Resistance – Pass
 8. ASTM E84, Class A Fire Resistant
 9. Recycle content >20%
- B. Acceptable Manufacturers
1. Basis of Design: Sika, Sikagard 530
 2. Acceptable: DuPont Liquid Applied Tyvek
 3. Others as meeting Performance Characteristics and approved by Architect
- C. Transition Membrane, Self-Adhering: Polymer-based, sheet membrane with polyester facing, and having the following physical properties:
1. Thickness: 35 mils (0.5 mm) min.
 2. Vapor permeance: <0.1
 3. Low temperature flexibility: -20 F to CGSB 37-GP-56M;
 4. Elongation: >90% to ASTM D412-modified
 5. ASTM E331, 10 psf for 2 hours
 6. Acceptable material:
 - a) MultiSeal 515 for use with the Sikagard 530 system.
 - b) Others as recommended by manufacturer
- D. Contractor Qualifications:
1. Contractor shall provide a manufacturer's letter stating that they have been trained and are approved to apply the manufacturers' air barrier.
 2. OPTIONAL: An ABAA Certified Contractor, specific certification for liquid applied.

2.02 PRIMER

- A. Primer for self-adhering membranes: Synthetic polymer-based adhesive type, quick setting, having the following characteristics:
1. Acceptable material: As manufactured and/or recommended by the Air Barrier System manufacturer.
 2. Verify compatibility of self-adhering membranes with preservative treated materials specified in Section 06 10 53. Prime preservative treated materials as required using primer recommended by self-adhering membrane manufacturer.

2.03 SEALANTS

- A. Sealants shall be compatible with air barrier assembly and shall be approved by the air barrier manufacturer.
- B. Products:
1. Sikaflex 11FC as joint seam sealer
 2. Sikaflex 102 Everflash Membrane for door and window rough openings
 3. SikaHyflex 407 Everflash Universal for difficult to bond substrates and transitions
- C. Primers: If required, as recommended by manufacturer for surfaces to be sealed.

- D. Backer Rods: As recommended by sealant manufacturer.
- E. Others as recommended by manufacturer

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.

3.02 PREPARATION

- A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrates to provide an even plane.
- B. Mortar joints in concrete block and form tie holes/voids in poured concrete shall be filled flush and smooth and allowed to be cured for a minimum of 24 hours.
- C. All joints between gypsum sheathing, roof board, masonry and concrete and other substrate joints up to 1/4" wide shall be treated:
 - 1. Sikaflex 11FC
 - 2. Others as recommended by approved manufacturer
- D. All joints between gypsum sheathing, roof board, masonry and concrete and other substrates wider than 1/4" shall be sealed with:
 - 1. MultiSeal 515, overlapping each side of joint a minimum of 3 inches
 - 2. SikaMembran 540
 - 3. Others as recommended by approved manufacturer
- E. Install backer rod and sealant at the following joints:
 - 1. All expansion/control/erection joints between concrete wall panels.
 - 2. All expansion/control joints in concrete block back-up.
 - 3. All joints between concrete wall panels and concrete block back-up.

3.03 PRIMER FOR TRANSITION MEMBRANE (SELF-ADHERING TYPE ONLY)

- A. Apply primer for self-adhering membranes at rate recommended by manufacturer.
- B. Apply primer to all areas to receive transition sheet membrane as indicated in Drawings by roller or spray and allow minimum 30-minute open time. Primed surfaces not covered by transition membrane during the same working day must be re-primed.

3.04 TRANSITION MEMBRANE (SELF-ADHERING TYPE)

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- A. Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 2 inch overlap at all end and side laps unless otherwise noted.
- B. Tie-in to roofing system and at the interface of dissimilar materials as indicated in Drawings.
- C. Promptly roll all laps and membrane with a counter top roller to affect seal.
- D. Ensure all preparatory work is complete prior to applying liquid membrane.

3.05 PRIMARY AIR BARRIER

- A. Apply by spray or roller, a complete and continuous unbroken film at an ambient and substrate surface temperature of 40°F and rising with less than a 30% chance of rain in the next 18 hours and apply at the same rate as listed in the Air Barrier Association of America evaluation
 - 1. Exterior Sheathing, Plywood or OSB
 - a. Sikagard 530 at a minimum of 2.5 gallons per 100 ft² (40 ft²/gallon) (40 wet mils)
 - b. Others meeting stated ABAA approval coverage rates.
 - c. Spray around all projections, including masonry veneer anchors, ensuring a complete and continuous air seal.

3.06 INSPECTION

- A. Notify Architect when sections of work are complete so as to allow for review prior to installing insulation. The manufacturer's representative shall be on site to review the installation along with the Architect.

3.07 PROTECTION OF FINISHED WORK

- A. Liquid membranes are not designed for permanent exposure. Cover the liquid membrane, as recommended by the manufacturer, within the following time frames. Contractor shall verify the number of calendar days with the air barrier manufacturer:
 - 1. Cover the Sikagard 530 material within 180 calendar days after installation. The nature of this product is such that some surface weathering may become apparent during exposure. This is a surface effect only and does not impact air barrier system performance.
 - 2. Transition membranes shall be covered within 180 days after installation
- B. Prepare, treat and seal vertical and horizontal surfaces at terminations and penetrations through the air barrier and at protrusions according to air barrier manufacturer's written instructions.

3.08 SCHEDULE

- A. Install liquid membrane system over the entire surface of the exterior sheathing in the following area. Seal any masonry anchor penetrations air tight.

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1. In the masonry cavity wall.
 - B. Install liquid membrane system over the entire surface of the outer surface of the inner wythe of masonry. Seal any masonry anchor penetrations air tight.
 - C. Hollow Metal Door Frames: Seal door frame to wall surface with Sikaflex 102 or SikaHyflex 407.
 - D. Wall and Roof Junction: Seal wall to roof with transition membrane.
 - E. Seal the top of sheathing to the underside of the roof assembly with foam or Sikaflex 11FC.
 - F. Openings: Seal around the perimeter of all openings with Sikaflex 11FC, Sikaflex 102 or SikaHyflex 407.
 - G. Perimeter wood nailers at wall openings: Cover all exposed surfaces of wood nailers with transition membrane. Extend membrane over sheathing, masonry and metal framing as shown.
 - H. Aluminum window frames with nailing flanges: Seal the nailing flanges to the wall surface with. Sikaflex 102 or SikaHyflex 407.
 - I. Window frames without nailing flanges: Seal frames to the wall surface with Sikaflex 11FC, Sikaflex 102, SikaHyflex 407.

END OF SECTION

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Asphalt shingles.
2. Underlayment.
3. Metal flashing and trim.

B. Related Requirements:

1. Section 077200 – Roof Accessories for gravity vents

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site.**

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.**

- B. Samples: For each exposed product and for each color and texture specified.**

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.**

- B. Evaluation reports.**

- C. Sample warranty.**

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.**

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.**

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 - 1. Material Warranty Period: 30 years from date of Substantial Completion, prorated, with first three years nonprorated.
 - 2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 110 mph for five years from date of Substantial Completion.
 - 3. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for five years from date of Substantial Completion.
 - 4. Workmanship Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories, Inc. or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Three-Tab-Strip Asphalt Shingles: ASTM D 3462/D 3462M, glass-fiber reinforced, mineral-granule surfaced, and self-sealing; with tabs regularly spaced.
 - 1. Certain Teed corp.; GAF; Owens Corning; Tamko Bldg. Products
 - 2. Strip Size: Manufacturer's standard.
 - 3. Algae Resistance: Granules resist algae discoloration.
 - 4. Impact Resistance: UL 2218, Class 4.
 - 5. Color and Blends: As indicated by manufacturer's designations As selected by Architect or Owner from manufacturer's full range.
- B. Hip and Ridge Shingles: Site-fabricated units cut from asphalt-shingle strips. Trim each side of lapped portion of unit to taper approximately 1 inch.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 40-mil-thick; with slip-resisting, polymer-film-reinforced or glass-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive; with release backing; cold applied; and evaluated and documented to be suitable for use for intended purpose under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Certaineed Corp.; GAF; Owens Corning; Tamko Bldg. Products
 - 2. Thermal Stability: Stable after testing at 240 deg F according to ASTM D 1970/D 1970M.

3. Low-Temperature Flexibility: Passes after testing at minus 20 deg F according to ASTM D 1970/D 1970M.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch-diameter, sharp-pointed, with a minimum 3/8-inch-diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking
 1. Shank: Barbed.
 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Synthetic-Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.
- D. Roof Louvers: See Section 077200 – Roof Accessories.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 1. Sheet Metal: Zinc-tin alloy-coated steel.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

3.2 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

3.3 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed at least 7 inches wide with self-sealing strip face up at roof edge.
 1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- F. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
 1. Where roof slope exceeds 2:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 3. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.
- G. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formed wall sheet metal fabrications.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For sheet metal flashing and trim.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Distinguish between shop- and field-assembled work.
 - 3. Include identification of finish for each item.
 - 4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.
- C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof edge, including fascia trim, approximately 10 feet long.

1.7 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As required by local authorities and building code.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Surface: Manufacturer's standard clear acrylic coating on both sides.
 - 2. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - b. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - c. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
 - 3. Color: As selected by Architect from manufacturer's full range.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Carlisle Coatings; Henry Co.; Owens Corning; Polyguard Products.
 - 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
 - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.
- B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Obtain field measurements for accurate fit before shop fabrication.

2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates. Shop fabricate interior and exterior corners.
1. Fabricate from the Following Materials:
 - a. Galvanized Steel: 0.028 inch thick.
- B. Roof-Penetration Flashing: Fabricate from the following materials:
1. Galvanized Steel: 0.028 inch thick.

2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch-high, end dams. Fabricate from the following materials:

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
 - 1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.4 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.5 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 076200

SECTION 077200 - ROOF 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. Gravity ventilators.
 - 2. Pipe portals.
 - 3. Preformed flashing sleeves.
- B. Related Sections:
 - 1. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
 - 2. Section 077100 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.

1.3 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof accessories.
 - 1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.7 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer 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: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design roof curbs and equipment supports to comply with wind performance requirements, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- C. Wind-Restraint Performance: 120 MPH .

2.2 GRAVITY VENTILATORS

- A. Low-Profile, Spun Aluminum or Hooded: Manufacturer's standard, fabricated as indicated, with manufacturer's standard welded or sealed mechanical joints.
 - 1. Air Vent, Inc.; Greenheck Fan Corp.; Metallic Products; Romlair Vent. Co.
 - 2. Construction: Integral base flange, vent cylinder, cylinder bird screen, relief air and rain cap [**hood**].
 - 3. Dimensions: Standard.
 - 4. Configuration: Rectangular or round.
 - 5. Bird Screens: Manufacturer's standard mesh with rewirable frame.
 - 6. Insect Screens: Manufacturer's standard mesh with rewirable frame.
 - 7. Security Grille: Provide for all units.
 - 8. Vent Cylinder, Base Flange, and Hood Material: Zinc-coated (galvanized) steel sheet, of manufacturer's standard thickness.
 - 9. Finish: As selected by Architect or owner from manufacturer's full range.
- B. Louvered Penthouse-Style Gravity Ventilators: Manufacturer's standard, fabricated as indicated, with manufacturer's standard welded or sealed mechanical joints.
 - 1. Greenheck Fan Corp.; Loren Cook Co.; Romlair Vent. Co.; Vent Prod.
 - 2. Construction: Integral frame with base flange, weathertight cap, and weatherproof sidewall louvers.
 - 3. Dimensions: Match existing.
 - 4. Configuration: Match existing.
 - 5. Bird Screens: Manufacturer's standard mesh with rewirable frame.
 - 6. Insect Screens: Manufacturer's standard mesh with rewirable frame.
 - 7. Frame, Base Flange, Cap, and Louver Material: Zinc-coated (galvanized) steel sheet, of manufacturer's standard thickness.
 - 8. Finish: As selected by Architect or owner from manufacturer's full range.

2.3 PREFORMED FLASHING SLEEVES

- A. Vent Stack Flashing: Metal flashing sleeve, uninsulated, with integral deck flange.
 - 1. Metal: Match existing.
 - 2. Height: Match existing.
 - 3. Diameter: Match existing.
 - 4. Finish: Match existing.

2.4 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation and mill phosphatized for field painting where indicated.
 - 1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
 - 2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil.

3. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A 755/A 755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.
 4. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
 5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- B. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.
- C. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.
- D. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.5 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPA C2; not less than 1-1/2 inches thick.
- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- D. Underlayment:
1. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
 2. Polyethylene Sheet: 6-mil-thick polyethylene sheet complying with ASTM D 4397.
 3. Slip Sheet: Building paper, 3 lb/100 sq. ft. minimum, rosin sized.
 4. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 5. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 6. Fasteners for Zinc-Coated or Aluminum-Zinc Alloy-Coated Steel: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.
 7. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

- 8. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
- F. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- G. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- H. Asphalt Roofing Cement: ASTM D 4586/D 4586M, asbestos free, of consistency required for application.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. 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, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.
 - 3. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Gravity Ventilator Installation: Verify that gravity ventilators operate properly and have unrestricted airflow. Clean, lubricate, and adjust operating mechanisms.
- D. Pipe Support Installation: Comply with MSS SP-58 and MSS SP-89. Install supports and attachments as required to properly support piping. Arrange for grouping of parallel runs of horizontal piping, and support together.
 - 1. Pipes of Various Sizes: Space supports for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
- E. Preformed Flashing-Sleeve and Flashing Pipe Portal Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions; flash sleeve flange to surrounding roof membrane according to roof membrane manufacturer's instructions.
- F. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Mildew-resistant joint sealants.
 - 4. Latex joint sealants.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Preconstruction laboratory test reports.
- C. Preconstruction field-adhesion-test reports.
- D. Field-adhesion-test reports.
- E. Sample warranties.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Two years from date of Substantial Completion.

- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

- 1. GE Constr.; Dow Corning; Pecora Corp.; Sika Corp.

- B. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

- 1. GE Constr.; Dow Corning; Pecora Corp.; Sika Corp.

- C. Silicone, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.

- 1. GE Constr.; Dow Corning; Pecora Corp.; Sika Corp.

- D. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Uses T and NT.

- 1. GE Constr.; Dow Corning; Pecora Corp.; Sika Corp.

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. GE Constr.; Dow Corning; Pecroa Corp.; Sika Corp.
- C. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT
 - 1. GE Constr.; Dow Corning; Pecroa Corp.; Sika Corp.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. BASF; Pecroa Corp.; Sika Corp.; Tremco Inc.
- B. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 1. BASF; Pecroa Corp.; Sika Corp.; Tremco Inc.

2.5 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Dow Corning; GE Constr.; Pecroa Corp.; Tremco Inc.

2.6 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), Type O (open-cell material) or Type B (bicellular material with a surface skin). Any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

- A. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Tile control and expansion joints.
 - c. Joints between different materials listed above.
 - d. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, M, P, 50, T, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints in unit masonry.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints in tile flooring.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, S, P, 25, T, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Tile control and expansion joints.

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- b. Vertical joints on exposed surfaces of walls and partitions.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, S, NS, 25, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
- 1. Joint Locations:
 - a. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Acrylic latex.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
- 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Silicone, mildew resistant, S, NS, 25, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS (NEW)

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. Exterior standard steel doors

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 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.
- C. Product Schedule: For hollow-metal doors, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Field quality control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. TRUDOOR, www.trudoor.com, 1-844-878-3667.
- B. Or Approved Equal

2.2 PERFORMANCE REQUIREMENTS

- A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.50 deg Btu/F x h x sq. ft. when tested according to ASTM C 518.

2.3 EXTERIOR STANDARD STEEL DOORS

- A. Construct hollow-metal doors to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
 - a.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3; SDI A250.4, Level A. (**At Apartment Entrance Door locations only**)

1. Doors:

- a. Type: As indicated in the Door and Frame Schedule.
- b. Thickness: 1-3/4 inches .
- c. Face: Metallic-coated steel sheet, minimum thickness of 18 ga. , with minimum **A40** coating.
- d. Edge Construction: Model 3, Stile and Rail; Six (6) panel.
- e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
- f. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
- g. Core: Manufacturer's full body Polystyrene; Vertical steel stiffener.
- h. STC Rated: 28
- i. R Value: 5.24

2. Frames:

- a. Materials: Wood
- b. Construction: Wood frame

2.4 FRAME ANCHORS

A. Jamb Anchors:

- 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

2.5 FABRICATION

- A. Hardware Preparation: Factory prepare hollow-metal doors and wood frames to receive templated mortised hardware, include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Or Comply with BHMA A156.115 for preparing hollow-metal doors and wood frames for hardware.

2.6 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 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. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 - 1. Non-Fire-Rated Steel Doors: Comply with SDI A250.8

3.3 FIELD QUALITY CONTROL

- A. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

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- B. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

3.4 CLEANING AND TOUCHUP

- A. 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.
- B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Hollow-core doors with wood-veneer faces.
3. Factory finishing flush wood doors.
4. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.

C. Samples: For wood veneer and factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ampco products; Chappell Door Co.; Oshkosh Door Co.; Mohawk Flush Door; or approved local supplier.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards or WDMA I.S.1-A, "Architectural Wood Flush Doors."
 - 1. Provide WI Certified Compliance Labels indicating that doors comply with requirements of grades specified.
- B. WDMA I.S.1-A Performance Grade:
 - 1. Heavy Duty unless otherwise indicated.
 - 2. Standard Duty: Closets, private toilets.
- C. Hollow-Core Doors:
 - 1. Construction: Standard hollow core.

2.3 DOORS FOR OPAQUE FINISH

- A. Exterior Solid-Core Doors
 - 1. Grade: Premium
 - 2. Faces: MDO
 - 3. Core: Either glued wood stave or structural composite lumber.
 - 4. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
 - 5. Adhesives: Type I per WDMA T.M.-6.
- B. Interior Hollow-Core Doors :
 - 1. Grade: Premium.
 - 2. Faces: Any closed-grain hardwood of mill option]or hardboard or MDF

2.4 LIGHT FRAMES AND LOUVERS

- A. Metal Louvers:
 - 1. Air Louvers Inc.; L&L Louvers Inc.; Louvers & Dampers Inc.; McGill Arch. Products
 - 2. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, factory primed for paint with baked-enamel- or powder-coated finish.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied.
- C. Openings: Factory cut and trim openings through doors.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Louvers: Factory install louvers in prepared openings.

2.6 SHOP PRIMING

- A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 099113 "Exterior Painting." And "Section 099123" Interior Painting."

2.7 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 085313 VINYL WINDOWS (MILGARD) (REVISED)

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Single Hung windows
 - 2. Glazing
 - 3. Accessories

- B. Related Sections:
 - 1. 079200 – Joint Sealants

1.2 SUBMITTALS

- A. Reference Section 013300 - Submittal Procedure; submit following items:
 - 1. Product Data: Submit Milgard product data.
 - 2. Shop Drawings: Include window schedule, elevations, sections, details, & multiple-window assembly details. Include head, sill & jamb conditions; operable parts & direction/handing; and special mullion reinforcement details.
 - 3. Samples: Submit selection samples for verification, include the following:
 - 3.1. Exterior Color: Minimum 1x4 color chips on fiberglass substrate: (Specify)
 - 3.2. Glass, showing specified clear glass.

Quality Assurance/Control Submittals:

- B.
 - 1. Qualifications: Proof of Manufacturer’s qualifications.
 - 2. U-Factor and Structural Rating charts required for NFRC and AAMA labeling requirements.
 - 3. Installation Instructions: AAMA 2400, (“Mounting Flange Installation”) or AAMA 2410 (“Flush Fin Installation”).
- C. Closeout Submittals: Reference Section 017800 – Submit following items:
 - 1. Temporary window labels to identify windows that labels were applied to.
 - 2. Owner’s Manual/Maintenance Instructions.
 - 3. Special Warranties.

1.3 QUALITY ASSURANCE

- A. Overall Standards: Comply with ANSI/AAMA/101/I.S.2, except where noted herein.
- B. Manufacturer Qualifications:
 - 1. Minimum 10 years experience in producing vinyl windows.
 - 2. Member AAMA & NFRC.
- C. Regulatory Requirements and Approvals:
- D. Certifications for Insulated Glass Units:
 - 1. Insulated glass units are certified to ASTM E2188/E2190 per the Associated Laboratories Incorporated (ALI) guidelines.

- E. AAMA: Windows shall be Gold Label certified with label attached to frame per AAMA requirements.
- F. NFRC: Windows shall be NFRC certified with temporary U-factor label applied to glass and an NFRC tab added to permanent AAMA frame label.

1.4 DELIVERY, STORAGE and HANDLING

- A. Comply with Manufacturer’s/Dealer’s ordering instructions and lead time requirements to avoid construction delays.
- B. Delivery: Deliver materials in Manufacturer’s standard packaging for protection of product.
- C. Storage & Protection: Store products away from exposure to environmental conditions that may be harmful to materials.
- D. Store materials off ground in an upright position. Provide cover from weather and construction activity.
- E. Follow Manufacturer’s instructions on label applied to units.

1.5 WARRANTY

- A. Commercial Warranty:
 - 1. 10 Year Warranty.
 - 2. Guarantee windows against defects in materials and workmanship including costs for replacement parts and labor.

Part 2 - PRODUCTS

2.1 MANUFACTURER

- A. Products supplied by the following manufacturer:

Milgard Manufacturing, Inc. 1010 54th Avenue East Tacoma, WA 98424

(800)-Milgard (645-4273) milgard.com

Manufacturer’s Representative/Supplier:

Name: Guido Lumber Co.

Telephone: (210) 344-8321

Fax: _____

E-mail: info@guidoco.com

- B. Window Series: Milgard Style Line® Series

- C. Substitutions: Reference Section 01 25 13 - Product Substitution Procedures

2.2 MANUFACTURED UNITS

- A. Proprietary Products: Tubular Extruded Poly Vinyl Chloride (PVC) Windows
1. Style Line® Series Windows
 2. Glazing
 3. Accessories

2.3 MATERIALS

- A. Integral color PVC compound containing impact-resistant solid plasticizer, titanium dioxide UV inhibitor, and surface and color stabilizers.
- B. Weatherstripping:
1. Vinyl compression bulb seal

2.4 SYSTEM DESCRIPTION

- A. General Performance Requirements: Products and systems provided must be manufactured, fabricated, and installed to the following performance criteria:
1. Comply with ANSI/AAMA/NWDA 101/I.S.2, except as noted herein.
 2. Performance Class: R
 3. Performance Grade: 15 psf
 4. U-Factor (NFRC 100): 0.5 btu/hr-ft: 59-F or less
 5. SHGC – Solar Heat Gain Coefficient (NFRC 200): 0.25 or less
 6. CRF minimum: Fame 52, Glazing 66
 7. VLT: not less 0.6
- B. Structural Requirements: Products and systems provided must be capable of withstanding wind loads based on testing units representative of those indicated for Project that pass AAMA/NWDA 101/I.S.2/NAFS, Uniform Structural Load Test:
1. Design Wind Loads: Determine design wind loads, according to ASCE, Section 6, applicable to Product from basic wind speeds (MPH) at 33 feet above grade, based upon mean roof heights indicated on Elevations/Drawings
 - a. Basic Wind Speed: 77 mph or as required by local code authorities.
 - b. Importance Factor: As required by local code authorities.
 - c. Exposure Category: As required by local code authorities.
 - d. Wind Load Requirement: As required by local code authorities.

2.5 WINDOW TYPES

- A. Single Hung – 6210 Series, 1-3/8” nail fin setback
1. Frame: 2-7/8” minimum depth. Multi-chambered vinyl profile.
 2. Sash: 1-3/16” minimum depth. Multi-chambered vinyl profile.
 3. Structural Class: H-LC30
 4. Hardware:
 - a. Positive action locking mechanism.
 - b. Concealed block and tackle balancer.
 5. Weatherstripping: Fin seal polypropylene pile.

2.6 GLAZING

- A. Insulated Glass Units: ASTM E 774, Class A
 - 1. Glazing Type: 7/8” dual
 - a. SunCoat® Low-E/Clear
 - b. SunCoatMAX® Low-E/Clear
 - c. Obscure at Specialty – Per Approval
 - 2. Overall IG Unit Thickness:
 - a. 3/4”.
 - 3. Spacer Type:
 - a. Aluminum box spacer
 - 4. Gas Filled:
 - a. None
 - 5. Glass Thickness:
 - a. Per Manufacturer’s Specifications

2.7 INSECT SCREENS: Provide heavy duty tight fitting screen (with hardware) for operating windows

- A. Screen Frame:
 - 1. Cambered formed aluminum with rigid plastic corner keys.
- B. Screen Mesh:
 - 1. Charcoal colored fiberglass mesh.

2.8 FABRICATION

- A. Fabricate frames and sash with mitered and fusion welded corners and joints.
- B. Trim and finish corners and welds to match adjacent surfaces.
- C. Provide concealed metal reinforcements in sash frame for attachment of lock mechanism.
- D. Factory interior glaze (except Double Hung and Double Slider) with snap-on mitered PVC glazing stops matching bevels on the sash and frame. Insulated glass units shall be reglazable without dismantling sash framing.
 - 1. Note: Field glazing is required for large window units (over 40 sq. ft).

2.9 FINISH

- A. Frame and Sash Color:
 - 1. Exterior: As selected by Architect or Owner.
 - 2. Interior matched to exterior
- B. Hardware: Painted or Metal finishes as supplied by Milgard
 - 1. Matched to interior frame finish
- C. Screen Frame Color:
 - 1. Matched to exterior frame color

2.10 SOURCE QUALITY CONTROL:

- A. Inspect windows in accordance with Manufacturer's Quality Control Program as required by AAMA Gold Label Certification.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Examine openings in which windows will be installed.
 - 1. Verify that framing complies with AAMA 2400 (Mounting Flange Installation) & AAMA 2410 (Flush Fin Installation).
 - 2. Verify that fasteners in framed walls are fully driven and will not interfere with window installation.
- B. Coordinate with responsible entity to correct unsatisfactory conditions.
- C. Commencement of work by installer is acceptance of substrate conditions.

3.2 INSTALLATION

- A. Install windows in framed walls in accordance with AAMA 2400 (“Mounting Flange Installation”) and/or AAMA 2410 (“Flush Fin Installation”).
- B. Do not remove temporary labels.
- C. Install insect screens on operable windows.
 - 1. Hold Screens: [Please coordinate with local supplier.]

3.3 CLEANING AND FINISHING

- A. Remove temporary labels and retain for Closeout Submittals.
- B. Clean soiled painted surfaces and glass using a mild detergent and warm water solution with soft, clean cloths.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mechanical door hardware for the following:
 - a. Swinging doors.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site
- B. Keying Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product in each finish specified.
- C. Door hardware schedule.
- D. Keying schedule.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedule.
2. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOJ's "2010 ADA Standards for Accessible Design", the DOT's "ADA Standards for Transportation Facilities", the ABA standards of the Federal agency having jurisdiction, ICC A117.1, HUD's "Fair Housing Accessibility Guidelines" and local codes .

2.2 SCHEDULED DOOR HARDWARE

- A. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule.
 1. Door Hardware Schedule is in Part 3

2.3 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
- C. Bored Locks: BHMA A156.2;
 1. As noted in Door Hardware Schedule

2.4 AUXILIARY LOCKS

1. As per Door Hardware Schedule

2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.
- B. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.
 1. Existing System:
 - a. Master key or grand master key locks to Owner's existing system.
- B. Keys:
 1. Stamping: As per instructions in keying conference:

2.7 OPERATING TRIM

- A. Operating Trim: BHMA A156.6; as indicated on Door Hardware Schedule.

2.8 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16.
 1. As noted in Door Hardware Schedule.

2.9 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
 1. As noted in Door Hardware Schedule

2.10 THRESHOLDS

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
 - 1. As noted in Door Hardware Schedule

2.11 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in Door Hardware Schedule. Balance of Hardware to be provided by the Pre-Hung Door Supplier and to match Door Hardware Finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as directed by Owner.
 - 2. Furnish permanent cores to Owner for installation.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."
- F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 1. Do not notch perimeter gasketing to install other surface-applied hardware.

3.2 ADJUSTING

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.3 DOOR HARDWARE SCHEDULE

A. HARDWARE SET # 01 – EXTERIOR UNIT ENTRY

DOORS # 100, 101, 104, 105

EACH TO HAVE:

1	EA	ENTRY LOCK	J54 MAR	630	DEX
1	EA	DEADBOLT	JD80	626	DEX
1	EA	DEADBOLT (2nd)	JD60	626	DEX
1	EA	DOOR GUARD	482A	702	IVE
1	EA	DOOR STOP	FS17	626	IVE
		DOOR VIEWER	U698	626	IVE

BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER

B. HARDWARE SET # 02 – EXTERIOR WATER CLOSET & STORAGE

DOORS # 102, 103, 106, 107

EACH TO HAVE:

1	EA	PASSAGE SET	J10 MAR	630	DEX
1	EA	DEADBOLT	JD60	626	DEX
1	EA	CRASH STOP	CS115-25 X SNB	626	IVE
		BALANCE HARDWARE	PROVIDED BY THE PRE-HUNG DOOR SUPPLIER		

C. HARDWARE SET # 03 – BATHROOM & BEDROOM

DOORS # , 111, , 115 (BATH)

EACH TO HAVE:

1	EA	PRIVACY LOCK	J40 MAR	630	DEX
1	EA	DOOR STOP	WS406CCV	630	IVE
		BALANCE HARDWARE	PROVIDED BY THE PRE-HUNG DOOR SUPPLIER		

DOORS # 109,110,113,114 (BEDROOM)

EACH TO HAVE:

1	EA	PASSAGE SET	J10 MAR	630	DEX
1	EA	DOOR STOP	WS406CCV	630	IVE

BALANCE HARDWARE PROVIDED BY THE PRE-HUNG DOOR SUPPLIER

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D. HARDWARE SET # 04 – CLOSET

DOORS # 108, 112

EACH TO HAVE:

1	EA	PASSAGE SET	J10 MAR	630	DEX
1	EA	DOOR STOP	61Z	619	IVE
		BALANCE HARDWARE	PROVIDED BY THE PRE-HUNG DOOR SUPPLIER		

GENERAL NOTES:

- 1) ALL EXTERIOR DOORS ARE PRE-HUNG AND SHALL BE PROVIDED WITH HINGES, SPRING HINGES, SEALS & THRESHOLDS BY THE PRE-HUNG DOOR & FRAME MANUFACTURER.
- 2) ALL INTERIOR DOORS ARE PRE-HUNG AND SHALL BE PROVIDED WITH HINGES BY THE PRE-HUNG DOOR & FRAME MANUFACTURER.
- 3) VERIFY KEYING REQUIREMENTS AND PROVIDE LOCKS KEYED TO THE EXISTING SYSTEM OR AS REQUIRED BY SAN ANTONIO HOUSING AUTHORITY.
- 4) PROVIDE A MINIMUM ONE (1) YEAR MAINTENANCE AND THREE (3) YEAR WARRANTY ON ALL HARDWARE PRODUCTS PROVIDED.

END OF SECTION 087100

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Exterior gypsum board for ceilings and soffits.
 - 3. Tile backing panels.
 - 4. Texture finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each texture finish indicated on same backing indicated for Work.

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. 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. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Certain Teed Corp.; Geo-Pacific Bldg.; National Gypsum; USG Corp.
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered.
- B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Certain Teed Corp.; Geo-Pacific Bldg.; National Gypsum; USG Corp.
2. Thickness: 1/2 inch.
3. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.

1. Certain Teed Corp.; Geo-Pacific Bldg.; National Gypsum; USG Corp.
2. Core: 5/8 inch, Type X.
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.

1. Certain Teed Corp.; James Hardie; National Gypsum; USG Corp.
2. Thickness: 1/2 inch or 5/8 inch.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. 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.

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
 2. Exterior Gypsum Soffit Board: Paper.
 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound, high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
- D. Joint Compound for Exterior Applications:
1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
- E. Joint Compound for Tile Backing Panels:
1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Pecora Corp.; Hilti Inc.; USG Corp.
- D. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

2.8 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Polystyrene Aggregate Ceiling Finish: Water-based, job-mixed, polystyrene aggregate finish with flame-spread and smoke-developed indexes of not more than 25 when tested according to ASTM E 84.
 - 1. Geo-Pacific Bldg.; National Gypsum; USG Corp.
 - 2. Texture: As selected by Architect.
- C. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.
 - 1. Geo-Pacific Bldg.; National Gypsum; USG Corp.
 - 2. Texture: As selected by Architect.
- D. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.
 - 1. Geo-Pacific Bldg.; National Gypsum; USG Corp.
 - 2. Texture: As selected by Architect.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C 840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. 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.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

- a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- 5. Level 5: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- H. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.2 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glazed wall tile.
 - 2. Tile backing panels.
 - 3. Waterproof membrane for thinset applications

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples:
 - 1. Each type and composition of tile and grout for each color and finish required

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.4 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. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.

2. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

- A. Ceramic Tile Type [CT-<#>]: Glazed wall tile.
 1. Crossville inc.; Daltile; Interceramic; American Olean; American Marazzi Tile
 2. Module Size: match existing
 3. Face Size Variation: Rectified.
 4. Thickness: 5/16 inch
 5. Face: match existing
 6. Finish: match existing glaze.
 7. Tile Color and Pattern: As selected by Architect or Owner from manufacturer's full range
 8. Grout Color: As selected by Architect or Owner from manufacturer's full range
 9. Mounting: Factory, back mounted.
 10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable[and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
 - a. Base: Match existing
 - b. Wainscot Cap: Match existing

2.3 TILE BACKING PANELS

- A. Fiber-Cement Backer Board: ASTM C 1288.

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1. CertainTeed; James Hardie
2. Thickness: 1/2 inch .

2.4 WATERPROOF MEMBRANE

- A. Waterproofing and Tile-Setting Adhesive: One-part, fluid-applied product intended for use as both waterproofing and tile-setting adhesive in a two-step process.

1. Bostik Inc. or approved equal

2.5 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less.

1. Bostik Inc.; Laticrete; Mapei Corp; Summitville Tile

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 the Work.

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.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. 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 toward drains.

3.3 CERAMIC TILE INSTALLATION

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA 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 TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. 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.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. Glazed Wall Tile: 1/8 inch .
- G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.
- I. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

3.4 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Wall Installations, Wood or Metal Studs or Furring:

1. Ceramic Tile Installation: TCNA W244C or TCNA W244F; thinset mortar on cementitious backer units or fiber-cement backer board.
 - a. Ceramic Tile Type: match existing.
 - b. Thinset Mortar: Modified dry-set or Improved modified dry-set mortar.
 - c. Grout: Water-cleanable epoxy grout.
 - d.

B. Shower Receptor and Wall Installations:

1. Ceramic Tile Installation : TCNA B415;[thinset mortar on waterproof membrane over cementitious backer units or fiber-cement backer board
 - a. Ceramic Tile Type: match existing
 - b. Thinset Mortar: Modified dry-set mortar.
 - c. Grout: Water-cleanable epoxy grout.

END OF SECTION 093013

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Thermoset-rubber base (TS).
 - 2. Rubber molding accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Birke Mercer Flooring; Johnsonite/Tarkett, Roppe Corp.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Style B, Cove: Provide in areas with resilient floor coverings.
- C. Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors: As selected by architect or owner from manufacturer's full range of colors.

2.2 RUBBER MOLDING ACCESSORY

- A. Description: Rubber reducer strip for resilient floor covering, joiner for tile and carpet transition strips.

- B. Profile and Dimensions: Manufacturer's standard.
- C. Colors and Patterns: As selected by architect or owner from manufacturer's products.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 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; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere 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. Job-Formed Corners:

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1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 36 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 36 inches in length.
 - a. Miter or cope corners to minimize open joints.

3.3 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 edges of floor covering that would otherwise be exposed.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vinyl composition floor tile (VCT).

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and pattern specified.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, 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.

2.2 VINYL COMPOSITION FLOOR TILE

- A. Armstrong World Industries; Congoleum Comp.; Johnsonite/Tarkett Co.; Mennington Mills.
- B. Tile Standard: ASTM F 1066, Class 1, solid color or Class 2, through pattern.
- C. Wearing Surface: Smooth.
- D. Thickness: 0.125 inch.

- E. Size: 12 by 12 inches.
- F. Colors and Patterns: As selected by Architect or Owner from manufacturer's full selection of products.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
1. Lay tiles square with room axis.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles as determined by architect or owner.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
1. Apply coat(s) as recommended by manufacturer's written instructions.

END OF SECTION 096519

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Fiber-cement board.
 - 2. Steel and iron.
 - 3. Galvanized metal.
 - 4. Wood.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

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1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Behr Process Corp.; Glidden Prof.; PPG Arch. Coating; Sherwin-Williams Co.
- B. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Fiber-Cement Board: 12 percent.
 2. Wood: 15 percent.
 3. Gypsum Board: 12 percent.

- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Cement Board Substrates:
 - 1. Latex System MPI EXT 3.3A, MPI EXT 3.3J:
 - a. Prime Coat: Latex, exterior, matching topcoat.
 - b. Prime Coat: Primer, alkali resistant, water based, MPI #3.
 - c. Intermediate Coat: Latex, exterior, matching topcoat.
 - d. Topcoat: Latex, exterior, flat (MPI Gloss Level 1), MPI #10.

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2. Alkyd System MPI EXT 3.3B:
 - a. Prime Coat: Primer, latex for exterior wood, MPI #6.
 - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
 - c. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5), MPI #8.

- B. Steel and Iron Substrates:
 1. Quick-Dry Enamel System MPI EXT 5.1A:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #76.
 - b. Intermediate Coat: Alkyd, quick dry, matching topcoat.
 - c. Topcoat: Alkyd, quick dry, semi-gloss (MPI Gloss Level 5), MPI #81.

- C. Wood Substrates: Exposed framing.
 1. Alkyd System MPI EXT 6.2C:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
 - c. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5), MPI #8.

- D. Wood Substrates: Wood trim, Doors.
 1. Alkyd System MPI EXT 6.3B:
 - a. Prime Coat: Primer, alkyd for exterior wood, MPI #5.
 - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
 - c. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5), MPI #8.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Wood.
 - 2. Gypsum board.
 - 3. Spray-textured ceilings.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Benjamin Moore; Glidden; PPG Architectural; Sherwin-Williams; Valspar
- B. Products: Subject to compliance with requirements provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect or Owner from manufacturer's full range
 - 1. Ten percent of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Wood: 15 percent.
 - 2. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE

- A. Wood Substrates: Wood trim, Architectural woodwork

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1. Alkyd System MPI INT 6.3B:
 - a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6), MPI #48.

- B. Wood Substrates: casework.
 1. Alkyd over Alkyd Sealer System MPI INT 6.4B:
 - a. Prime Coat: Primer sealer, alkyd, interior[, MPI #45.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, gloss (MPI Gloss Level 6), MPI #48.

- C. Spray-Textured Ceiling Substrates:
 1. Alkyd over Alkyd Sealer System MPI INT 9.1D:
 - a. Prime Coat: Primer sealer, alkyd, interior, MPI #45.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, flat (MPI Gloss Level 1), MPI #49.

- D. Gypsum Board Substrates:
 1. Alkyd System MPI INT 10.1B:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50.
 - b. Intermediate Coat: Alkyd, interior, matching topcoat.
 - c. Topcoat: Alkyd, interior, semi-gloss (MPI Gloss Level 5), MPI #47

END OF SECTION 099123

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Private-use bathroom accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: Full size, for each exposed product and for each finish specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PRIVATE-USE BATHROOM ACCESSORIES (See Sheet A100 – Floor Plan for Toilet Accessory Legend)

- A. Toilet Tissue Dispenser: (TA-2)

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- B. Shower Curtain Rod: (TA-4)
- C. Soap Dish: (TA-9)
- D. Recessed Medicine Cabinet: (TA-1_)
- E. Grab Bars: (TA-6 and TA-7)
- F. Towel Bar: (TA-3)
- G. Shower Curtain Rod: (TA-4)
- H. Shower Curtain: (TA-5)
- I. Shower Trim Kit: (TA-8)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

END OF SECTION 102800

SECTION 122113 - HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Horizontal louver blinds with aluminum slats.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For horizontal louver blinds, include fabrication and installation details.
- C. Samples: For each exposed product and for each color and texture specified, 12 inches long.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

- A. CACO Inc.; Hunter-Douglas Contract; Levelor inc.
- B. Slats: Aluminum; alloy and temper recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
 - 1. Width: 1 inch
 - 2. Thickness: Manufacturer's standard
 - 3. Features:
 - a. Lift-Cord Rout Holes: Minimum size required for lift cord and located near back (outside) edge of slat to maximize slat overlap and minimize light gaps between slats.

- C. Headrail: Formed steel or extruded aluminum; long edges returned or rolled. Headrails fully enclose operating mechanisms on three sides.
 - 1. Manual Lift-Operator and Tilt-Operator Lengths: Manufacturer's standard]
 - 2. Manual Lift-Operator and Tilt-Operator Locations: Manufacturer's standard unless otherwise indicated. Operator: Clear-plastic wand
- D. Bottom Rail: Formed-steel or extruded-aluminum tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
 - 1. Type: Manufacturer's standard
- E. Ladders: Reinforced vinyl tape, manufacturer's standard width
- F. Valance: PVC strip
- G. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
- H. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.
- I. Side Channels and Perimeter Light Gap Seals: Manufacturer's standard.
- J. Colors, Textures, Patterns, and Gloss:
 - 1. Slats As selected by Architect or Owner from manufacturer's full range
 - 2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated

2.2 HORIZONTAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch plus or minus 1/8 inch

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Locate so exterior slat edges are not closer than 1 inch from interior faces of glass and not closer than 1/2 inch from interior faces of glazing frames through full operating ranges of blinds.
 - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

- B. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

- C. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

END OF SECTION 122113

SECTION 123530 - RESIDENTIAL CASEWORK (REVISED)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes kitchen and vanity cabinets.
- B. Related Requirements:
 - 1. Section 123623.13 "Plastic-Laminate-Clad Countertops."

1.2 DEFINITIONS

- A. MDF: Medium-density fiberboard.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cabinets.
 - 2. Cabinet hardware.
- B. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
- C. Samples: For cabinet finishes.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For casework, tested and certified by Kitchen Cabinet Manufacturer Association.

PART 2 - PRODUCTS

2.1 CABINETS

- A. Approved local cabinet manufacturers
- B. Quality Standard: Provide cabinets that comply with KCMA A161.1.
 - 1. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with the above standard.
- C. Face Style: Reveal overlay.
- D. Cabinet Style: Face frame.

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- E. Door and Drawer Fronts: Solid-wood, 5/8 inch thick
- F. Face Frames: 3/4-by-1-5/8-inch solid wood with glued mortise and tenon or doweled joints.
- G. Exposed Cabinet End Finish: Wood veneer stain as selected by Architect or Owner.

2.2 CABINET MATERIALS

- A. Hardwood Lumber: Kiln dried to 7 percent moisture content. Meet "severe use per HUD.
- B. Concealed Materials: Solid wood or plywood, of any hardwood, with no defects affecting strength or utility; .

2.3 CABINET HARDWARE

- A. General: Manufacturer's standard units, corrosion resistant, complying with BHMA A156.9, of type, size, style, material and finish as selected by Architect or Owner from manufacturer's full range.
- B. Pulls: Wire pulls.
- C. Hinges: Semiconcealed (wraparound) butt hinges for overlay doors.
- D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
- B. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.
- C. Install cabinets level and plumb to a tolerance of 1/8 inch in 8 feet.
- D. Fasten cabinets to adjacent units and to backing.
 - 1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.2 ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

END OF SECTION 123530

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes plastic-laminate-clad countertops.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For plastic-laminate-clad countertops.
 - 1. Apply WI Certified Compliance Program label to Shop Drawings.
- C. Samples: Plastic laminates in each type, color, pattern, and surface finish required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For the following:
 - 1. Composite wood products.
 - 2. High-pressure decorative laminate.
 - 3. Adhesives.
- B. Quality Standard Compliance Certificates: WI Certified Compliance Program.

1.4 QUALITY ASSURANCE

- A. 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 in-service performance.
 - 1. Shop Certification: WI's Certified Compliance Program licensee.
- B. Installer Qualifications: Fabricator of products, WI's Certified Compliance Program licensee.

PART 2 - PRODUCTS

2.1 FABRICATORS

- A. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:

1. As approved by Architect or Owner.

2.2 PLASTIC-LAMINATE-CLAD COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.
 1. Provide inspections of fabrication and installation together with labels and certificates from WI certification compliance program indicating that countertops comply with requirements of grades specified.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS
 1. Formica Corp; Nevamar; Wilson Art
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 1. As selected by Architect or Owner from manufacturer's full range in the following categories:
 - a. Solid colors, gloss or matte finish.
 - b. Solid colors with core same color as surface, gloss or matte finish.
 - c. Wood grains, gloss or matte finish with grain running parallel to length of countertop.
 - d. Patterns, gloss or matte finish.
- E. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- F. Core Material: MDF made with exterior glue or Exterior-grade plywood or As selected by fabricator to comply with quality standard.
- G. Core Material at Sinks: MDF made with exterior glue or exterior-grade plywood.
- H. Core Thickness: 3/4 inch.
 1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- I. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.
- J. Paper Backing: Provide paper backing on underside of countertop substrate.

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.

1. MDF: Medium-density fiberboard, ANSI A208.2, Grade 130.
2. Softwood Plywood: DOC PS 1.

2.4 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement or Contact cement or PVA As selected by fabricator to comply with requirements.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:

1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

1. Secure field joints in countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten

according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

- D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches variation from a straight, level plane.
 - 2. Secure backsplashes to walls with adhesive.
 - 3. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.
- F. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION 123623.13

SECTION 22 02 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.
- C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect, expressed in writing, is equal to that specified.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.
- C. The approximate locations of Mechanical (HVAC) and Plumbing items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.
- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.
- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".
- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.
- I. The Contractor shall participate in the commissioning process as required. Including, but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.
- B. All piping or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit shop drawings for approval.
- C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the contractor at no additional cost to the owner.
- D. Additional coordination with electrical contractor may be required to allow adequate clearances of electrical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

- A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.
- B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

- A. Finish painting is specified. Prime and protective painting are included in the work of this Division.

- B. Owner and General Contractor furnished equipment shall be properly connected to Plumbing systems.
- C. Furnishing and installing all required Plumbing equipment control relays and electrical interlock devices, conduit, wire and J-boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

- A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division 01 for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or valves properly protected from incidental damage and weather damage.
- C. Damaged equipment, valves or pipe shall be promptly removed from the site and new, undamaged equipment, pipe and valves shall be installed in its place promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

- A. The pumping systems and the component parts there of, shall be guaranteed to operate without objectionable noise and vibration.
- B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the Building structure, piping and other items.
- C. Carefully fabricate pipe and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.
- D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

- A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.
- B. Arrange with the serving utility companies for the connection of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.

- C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements of the following nationally accepted codes and standards:
1. American Society of Plumbing Engineers, ASPE.
 2. American Standards Association, ASA.
 3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
 4. American Society of Mechanical Engineers, ASME.
 5. American Society of Plumbing Engineers, ASPE.
 6. American Society of Testing Materials, ASTM.
 7. American Water Works Association, AWWA.
 8. National Bureau of Standards, NBS.
 9. National Fire Protection Association, NFPA.
 10. Underwriters' Laboratories, Inc., UL.
 11. International Energy Conservation Code, IECC.
- D. Where differences existing between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Engineer in writing of all differences.
- E. When directed in writing by the Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, correct the deficiencies, and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 01.
- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.
- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities

and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.
- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.
- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.
- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 2009 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

- A. These Specifications are intended to supplement the Drawings and it will not be the province of the Specifications to mention any part of the work which the Drawings are competent to fully explain in every particular and such omission is not to relieve the Contractor from carrying out portions indicated on the Drawings only.
- B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least 7 working days prior to bid opening date for issuance of an addendum.
- C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.
- D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.
- E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing 10 days prior to the bid date without fail.
- F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.
- G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equal construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.
- H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUAL" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUAL" product, material or method may be used if it complies with the specifications and is submitted for review to the Engineer as outline herein.
- I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical and Plumbing Design Documents and all other trades, including Division 26.
- J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This

shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected subcontractors shall be the responsibility of this bidder and not the owner.

- K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.
- L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with above and if accepted, will issue a letter allowing the substitutions.
- M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades and pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

- A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or mylar in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:
 - 1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
 - 2. An index page with a listing of all data included in the Submittal.
 - 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
 - 4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 - 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.

6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".
- B. Refer to Division 01 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.
- D. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
 2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
 3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
 4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
 5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor

shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Submittals are required for, but not limited to, the following items:
 - 1. Basic Materials.
 - 2. Plumbing Fixture and Valves.
 - 3. Support and Couriers.
 - 4. Floor Drain, Roof Drain and Cleanouts.
 - 5. Interceptors/Traps (All Types).
 - 6. Water Heaters
 - 7. Water Softeners.
 - 8. Water Treatment.
 - 9. Domestic Water Booster Pumps.
 - 10. Fire Pumps and Jockey Pumps.
 - 11. Fire Pump Controllers
 - 12. Backflow Preventers.
 - 13. Plumbing Piping.
 - 14. Expansion Compensation.
 - 15. Variable Frequency Drives.
 - 16. Noise and Vibration Controls.
 - 17. Portable Pipe Hanger and Equipment Supports.
 - 18. Plumbing Specialties.
 - 19. Water Filters.
 - 20. Test, Adjust and Balance Reports.
 - 21. Testing, Adjusting and Balancing Contractor Qualifications.
 - 22. Coordination Drawings.
- I. Refer to Division 26 sections for additional shop drawing requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. Indicate the proposed locations of pipe, equipment, and other materials. Include the following:
 - a. Wall and type locations.
 - b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.

- d. Clearances for servicing and maintaining equipment, including tube removal and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm, sanitary sewer piping and plumbing piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.
 - j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.
- 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 - 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.
 - C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Special Project Requirements, in addition to the requirements specified in Division 23, indicate the following installed conditions:
 - 1. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
 - 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 - 3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
 - 4. Contract Modifications, actual equipment and materials installed.
- B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.
- C. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
- D. Refer to Division 01 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.

- E. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.
- F. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
- G. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 OPERATING MANUALS

- A. Prepare maintenance manuals in accordance with Division 01 and in addition to the requirements specified in Division 01, include the following information for equipment items:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing instructions and lubrication charts and schedules.

1.17 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.

- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.
- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 22.

1.18 MAINTENANCE MANUALS

- A. Coordinate with Division 01 for maintenance manual requirements, unless noted otherwise bind together in "D ring type" binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼" of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Plumbing Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 22 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 22, include the following information for equipment items:
 1. Identifying names, name tags designations and locations for all equipment.
 2. Valve tag lists with valve number, type, color coding, location and function.
 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 4. Fabrication drawings.
 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 8. Equipment and motor name plate data.
 9. Wiring diagrams.
 10. Exploded parts views and parts lists for all equipment and devices.
 11. Color coding charts for all painted equipment and conduit.
 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.

- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.19 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 22 Sections for additional Operator Training requirements.

1.20 FINAL COMPLETION

- A. At the completion of the work, all equipment and systems shall be tested and faulty equipment and material shall be repaired or replaced. Refer to Sections of Division 26 for additional requirements.
- B. Clean and adjust all air distribution devices and replace all air filters immediately prior to final acceptance.
- C. Touch up and/or refinish all scratched equipment and devices immediately prior to final acceptance.

1.21 CONTRACTOR'S GUARANTEE

- A. Use of the HVAC and Plumbing systems to provide temporary service during construction period will not be allowed without permission from the Owner in writing and if granted shall not be cause warranty period to start, except as defined below.
- B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one year after its completion and final acceptance, and shall furnish free of additional cost to the Owner all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of issue of Substantial Completion, Beneficial Occupancy by the Owner or the Certificate of Final Payment as agreed upon by all parties.
- C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.
- D. All air compressors shall have parts and labor guarantees for a period of not less than 5 years beyond the date of final acceptance.
- E. Refer to Sections in Division 22 for additional guarantee or warranty requirements.

1.22 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for

the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.

- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.
- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.
It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.
If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.
- F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the "CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per "CD".
The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.
- G. This Five Hundred Dollars (\$500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per "CD" cost of reproduction is to only recover the cost of the man-hours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials and equipment manufactured by a domestic United States manufacturer.
- B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges

and screw driver cam locks.

- C. All access panels located in wet areas such as restrooms, locker rooms, shower rooms, kitchen and any other wet areas shall be constructed of stainless steel.
- D. Access Doors: shall be as follows:
 - 1. Plastic Surfaces: Milcor Style K.
 - 2. Ceramic Tile Surface: Milcor Style M.
 - 3. Drywall Surfaces: Milcor Style DW.
 - 4. Install panels only in locations approved by the Architect.

PART 3 - EXECUTION

3.01 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.
- B. Refer to equipment specifications in Divisions 21 through 22 for additional rough-in requirements.

3.02 PLUMBING INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of plumbing and fire systems, materials, and equipment. Comply with the following requirements:
 - 1. Coordinate plumbing systems, equipment, and materials installation with other building components.
 - 2. Verify all dimensions by field measurements.
 - 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for plumbing installations.
 - 4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
 - 5. Sequence, coordinate, and integrate installations of plumbing materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
 - 6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 - 7. Coordinate connection of plumbing systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
 - 8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and route proposed solution to the Architect for review.
 - 9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
 - 10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.

11. Install access panel or doors where valves and equipment are concealed behind finished surfaces. Access panels and doors are specified.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curb to match roof slope. Refer to architectural drawings and details.
14. The equipment to be furnished under this Specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.
15. The architectural and structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, ducts, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Mechanical Equipment:
 - a. Mechanical equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Shop drawings shall include dimensions and lettering format for approval. Attachments shall be with escutcheon pins, self-tapping screws, or machine screws.
 - b. Tags shall be attached to all valves, including control valves, with nonferrous chain. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the temperature control submittal and the "as-built" drawings.

3.03 CUTTING AND PATCHING

- A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 1. Uncover Work to provide for installation of ill-timed Work.
 2. Remove and replace defective Work.
 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 4. Remove samples of installed Work as specified for testing.
 5. Install equipment and materials in existing structures.
 6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
 7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Section "DEFINITIONS" for definition of "Installer."

- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, mechanical ducts and HVAC units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.04 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

- A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:
 - 1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
 - 2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.

3.05 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

- A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by his contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be apart of this Contract.
- B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.
- C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe and duct pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.
- D. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so

conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

- E. Certain work during the demolition phase of construction may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time at least seventy-two (72) hours in advance in writing.
- F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.
- G. Equipment, piping or other potential hazards to the working occupants of the building shall not be left overnight outside of the designated working or construction area.
- H. Make every effort to minimize damage to the existing building and the owner's property. Repair, patch or replace as required any damage that might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.
- I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.
- J. All existing plumbing fixtures, pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.
- K. Pipe, duct, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.
- L. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.
- M. Refer to Architectural "Demolition and/or Alteration" plans for actual location of walls, ceiling, etc., being removed and/or remodeled.

END OF SECTION

SECTION 22 05 16 – EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Flexible pipe connections.
- B. Expansion joints and compensators
- C. Pipe loops, offsets, and swing joints.

1.02 RELATED WORK

- A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.
- B. Section 22 10 00 – Plumbing Piping.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.
- B. Expansion Calculations:
 - 1. Installation Temperature: 50 degrees F (10 degrees C).
 - 2. Hot Water Heating: 210 degrees F (99 degrees C).
 - 3. Domestic Hot Water: 140 degrees F (60 degrees C).
 - 4. Safety Factor: 30 percent.
- C. Pipe sizes indicated are to establish a minimum quality of compensator. Refer to manufacturers' literature for model series for different pipe sizes.

1.04 SUBMITTALS

- A. Submit shop drawings under provisions of Division One.
- B. Product Data:
 - 1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot (meter) and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
 - 2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.
- C. Design Data: Indicate selection calculations.
- D. Manufacturer's Installation Instructions: Indicate special procedures, and external controls.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division One.

- B. Record actual locations of flexible pipe connectors, expansion joints, anchor, and guides.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division One.
- B. Maintenance Data: Include adjustment instructions.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Design expansion compensation system under direct supervision of a Professional Engineer experienced in design of this work and licensed in the state where the project is located.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, project and handle products to site under provisions of Division One.
- B. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.
- C. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.09 WARRANTY

- A. Provide five year warranty under provisions of Division One.
- B. Warranty: Include coverage for leak free performance of packed expansion joints.

1.10 EXTRA MATERIALS

- A. Furnish under provisions of Division One.

PART 2 - PRODUCTS

2.01 FLEXIBLE PIPE CONNECTORS

- A. Steel Piping (Based on 2" Pipe):
 - 1. Manufacturers:
 - a. Amber/Booth Metal-Flex, Model Type SS-PM or FW
 - b. Triplex, Model Flexonics Series 400M
 - c. Mercer Rubber Company, Model BSS-EM (Mason Industries)
 - 2. Inner Hose: Type 321, stainless steel, corrugated metal.
 - 3. Exterior Sleeve: Type 321, single braided stainless steel.
 - 4. Pressure Rating: 350 psig WOG and 70 degrees F. For 4 inch pipe - 200 psig WOG and 70 degrees F.
 - 5. Joint: Schedule 40 steel, threaded with male nipple and hex boss each end and Union. Flanged joints for pipe sizes 2½ inch and larger.
 - 6. Size: Use pipe sized units.
 - 7. Maximum offset: 1/2 inch on each side of installed center line.

8. Application: Air handling units cooling and heating coils.
- B. Copper Piping (Based on 2" Pipe):
1. Manufacturers:
 - a. Amber/Booth Metal-Flex, Model Type BR-SM
 - b. Triplex, Model Flexonics Series 300
 - c. Mercer Rubber Company, Type BFF (Mason Industries)
 2. Inner Hose: Corrugated Bronze
 3. Exterior Sleeve: Braided bronze.
 4. Pressure Rating: 250 psig WOG and 70 degrees F.
 5. Joint: Threaded with male nipple and hex boss each end with Union. Flanged joints for pipe sizes 2½ inch and larger.
 6. Size: Use pipe sized units.
 7. Maximum offset: 1/2 inch on each side of installed center line.
 8. Application: Air handling units cooling and heating coils.

2.02 EXPANSION JOINTS

- A. Bellows Type (Based on 4" Pipe):
1. Manufacturers:
 - a. Amber/Booth, Style EB
 - b. Triplex, Model Resistoflex R6905
 - c. Mercer Rubber Company, Style 803 or 805 (Mason Industries)
 2. Body: Monel wire reinforced molded TFE teflon bellows, multiple arch.
 3. Pressure Rating: 70 psig WSP and 250 degrees F (66 degrees C).
 4. Maximum Compression: 1 inch.
 5. Maximum Extension: 1 inch.
 6. Maximum Offset: 1/2 inch.
 7. Joint: ASA standard ductile iron flanges, integral molded gasket.
 8. Size: Use pipe sized units.
 9. Accessories: Control rod limit bolts.
 10. Application: Steel piping 8 inch and under.

2.03 ACCESSORIES

- A. Pipe Alignment Guides to Direct Axial Movement:
1. Manufacturers:
 - a. Triplex, Model Flexonics
 - b. Metraflex, Style II
 2. Two piece welded steel with shop paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Construct spool pieces to exact size of flexible connection for future insertion.
- C. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provided line size flexible connectors.

- D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- E. Provide miscellaneous metals to rigidly anchor pipe to building structure. Provide pipe guides so that movement takes place along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.
- F. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.

3.02 MANUFACTURER'S FIELD SERVICES

- A. Prepare and start systems under provisions of Division One.
- B. Provide inspection services by flexible pipe manufacturer's representative for final installing and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

END OF SECTION

SECTION 22 05 29 – HANGERS AND SUPPORT FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Pipe, and equipment hangers, supports, and associated anchors.
- B. Sleeves and seals.
- C. Flashing and sealing equipment and pipe stacks.

1.02 RELATED WORK

- A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.
- B. Section 22 07 19 – Plumbing Piping Insulation.
- C. Section 22 07 16 – Plumbing Equipment Insulation.
- D. Section 21 00 00 - Fire Protection and 21 13 13 Wet Pipe Sprinkler System.
- E. Section 22 10 00 - Plumbing System.
- F. Section 23 21 13 – Above Ground Hydronic Piping.
- G. Section 23 23 00 – Refrigerant Piping

1.03 REFERENCES

- A. ANSI/ASME B31.1 - Power Piping.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems.
- C. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems.

1.04 QUALITY ASSURANCE

- A. Supports for Sprinkler Piping: In conformance with NFPA 13.
- B. Supports for Standpipes: In conformance with NFPA 14.

1.05 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division One.
- B. Indicate hanger and support framing and attachment methods.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 to 4 Inches Carbon steel, adjustable, clevis.

- C. Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for pipe sizes 6 inches and over.
- E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- F. Wall Support for Pipe Sizes 4 Inches and Over: adjustable steel yoke and cast iron roll.
- G. Vertical Support: Steel riser clamp.
- H. Floor Support for Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.
- I. Floor Support for Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
- J. Roof Pipe Supports and Hangers: Galvanized Steel Channel System as manufactured by Portable Pipe Hangers, Inc. or approved equal.

For pipes 2-1/2" and smaller – Type PP10 with roller
For pipes 3" through 8" – Type PS
For multiple pipes – Type PSE - Custom
- K. Copper Pipe Support and Hangers: Electro-galvanized with thermoplastic elastomer cushions; Unistrut "Cush-A-Clamp" or equal. Hangers: Plastic coated; Unistrut or equal.
- L. For installation of protective shields refer to specification section 22 07 19 -3.03.
- M. Shields for Vertical Copper Pipe Risers: Sheet lead.
- N. Pipe Rough-In Supports in Walls/Chases: Provide preformed plastic pipe supports, Sioux Chief "Pipe Titan" hold rite or equal.

2.02 HANGER RODS

- A. Galvanized Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

2.03 INSERTS

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 FLASHING

- A. Metal Flashing: 20 gage galvanized steel.
- B. Lead Flashing: 4 lb./sq. ft. sheet lead for waterproofing; 1 lb./sq. ft. sheet lead for soundproofing.
- C. Caps: Steel, 20 gage minimum; 16 gage at fire resistant elements.
- D. Coordinate with roofing contractor/architect for type of flashing on metal roofs.

2.05 EQUIPMENT CURBS

- A. Fabricate curbs of hot dipped galvanized steel.

2.06 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: Form with 18 gage galvanized steel, tack welded to form a uniform sleeve.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe, schedule 40.
- C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated steel sleeves including seals, UL listed.
- D. Sleeves for Round Ductwork: Form with galvanized steel.
- E. Sleeves for Rectangular Ductwork: Form with galvanized steel.
- F. Fire Stopping Insulation: Glass fiber type, non-combustible, U.L. listed.
- G. Caulk: Paintable 25-year acrylic sealant.
- H. Pipe Alignment Guides: Factory fabricated, of cast semi-steel or heavy fabricated steel, consisting of bolted, two-section outer cylinder and base with two-section guiding spider that bolts tightly to pipe. Length of guides shall be as recommended by manufacturer to allow indicated travel.

2.07 FABRICATION

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers without disengagement of supported pipe.
- C. Design roof supports without roof penetrations, flashing or damage to the roofing material.

2.08 FINISH

- A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.01 INSERTS

- A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Coordinate with structural engineer for placement of inserts.
- B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.
- D. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab. Verify

with structural engineer prior to start of work.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

<u>PIPE SIZE</u>	<u>MAX. HANGER SPACING</u>	<u>HANGER DIAMETER</u>
(Steel Pipe)		
1/2 to 1-1/4 inch	7'-0"	3/8"
1-1/2 to 3 inch	10'-0"	3/8"
4 to 6 inch	10'-0"	1/2"
8 to 10 inch	10'-0"	5/8"
12 to 14 inch	10'-0"	3/4"
15 inch and over	10'-0"	7/8"
(Copper Pipe)		
1/2 to 1-1/4 inch	5'-0"	3/8"
1-1/2 to 2-1/2 inch	8'-0"	3/8"
3 to 4 inch	10'-0"	3/8"
6 to 8 inch	10'-0"	1/2"
(Cast Iron)		
2 to 3 inch	5'-0"	3/8"
4 to 6 inch	10'-0"	1/2"
8 to 10 inch	10'-0"	5/8"
12 to 14 inch	10'-0"	3/4"
15 inch and over	10'-0"	7/8"
(PVC Pipe)		
1-1/2 to 4 inch	4'-0"	3/8"
6 to 8 inch	4'-0"	1/2"
10 and over	4'-0"	5/8"

- B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- C. Place a hanger within 12 inches of each horizontal elbow and at the vertical horizontal transition.
- D. Use hangers with 1-1/2 inch minimum vertical adjustment.
- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Install hangers with nut at base and above hanger; tighten upper nut to hanger after final installation adjustments.
- J. Portable pipe hanger systems shall be installed per manufactures instructions.

3.03 Insulated Piping: Comply with the following installation requirements.

- A. Clamps: Attach galvanized clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.
- B. Saddles: Install galvanized protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.
- C. Shields: Install protective shields MSS Type 40 on cold and chilled water piping that has vapor barrier. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

<u>NPS</u>	<u>LENGTH</u>	<u>THICKNESS</u>
1/4 THROUGH 3-1/2	12	0.048
4	12	0.060
5 & 6	18	0.060
8 THROUGH 14	24	0.075
16 THROUGH 24	24	0.105

- D. Piping 2" and larger provide galvanized sheet metal shields with calcium silicate at hangers/supports.
- E. Insert material shall be at least as long as the protective shield.
- F. Thermal Hanger Shields: Install where indicated, with insulation of same thickness as piping.

3.04 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.
- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.05 FLASHING

- A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 8 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter flash and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor shower mop sink and all other drains watertight to adjacent materials.
- E. Provide curbs for mechanical roof installations 8 inches minimum high above roofing surface. Contact architect for all flashing details and roof construction. Seal penetrations watertight.

3.06 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Extend sleeves through floors minimum one inch above finished floor level. Caulk sleeves full depth with fire rated thermfiber and 3M caulking and provide floor plate.
- C. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with U.L. listed fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- D. Fire protection sleeves may be flush with floor of stairways.

END OF SECTION

SECTION 22 05 53 – IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

- 1.03 Refer to Architectural Sections for additional requirements.

PART 2 - PRODUCTS

2.01 VALVE AND PIPE IDENTIFICATION

A. Valves:

1. All valves shall be identified with a 1-1/2" diameter brass disc wired onto the handle. The disc shall be stamped with 1/2" high depressed black filled identifying numbers. These numbers shall be numerically sequenced for all valves on the job.
2. The number and description indicating make, size, model number and service of each valve shall be listed in proper operational sequence, properly typewritten. Three copies to be turned over to Owner at completion.
3. Tags shall be fastened with approved meter seal and 4 ply 0.018 smooth copper wire. Tags and fastenings shall be manufactured by the Seton Name Plate Company or approved equal.
4. All valves shall be numbered serially with all valves of any one system and/or trade grouped together.

B. Pipe Marking:

1. All interior visible piping located in accessible spaces such as above accessible ceilings, equipment rooms, attic space, under floor spaces, etc., shall be identified with all temperature pipe markers as manufactured by W.H. Brady Company, 431 West Rock Ave., New Haven, Connecticut, or approved equal.
2. All exterior visible piping shall be identified with UV and acid resistant outdoor grade acrylic plastic markers as manufactured by Set Mark distributed by Seton nameplate company. Factory location 20 Thompson Road, Branford, Connecticut, or approved equal.
3. Generally, markers shall be located on each side of each partition, on each side of each tee, on each side of each valve and/or valve group, on each side of each piece of equipment, and, for straight runs, at equally spaced intervals not to exceed 75 feet. In congested area, marks shall be placed on each pipe at the points where it enters and leaves the area and at the point of connection of each piece of equipment and automatic control valve. All markers shall have directional arrows.
4. Markers shall be installed after final painting of all piping and equipment and in

such a manner that they are visible from the normal maintenance position. Manufacturer's installation instructions shall be closely followed.

5. Markers shall be colored as indicated below per ANSI/OSHA Standards:

<u>SYSTEM</u>	<u>COLOR</u>	<u>LEGEND</u>
Sanitary Sewer	Green	Vent
		Sanitary Sewer
Storm Drain	Green	Storm Drain
Domestic Water	Green	Domestic Water
Domestic Hot Water	Yellow	Domestic Hot
Supply		Water Supply
Domestic Hot Water	Yellow	Domestic Hot
Recirculating		Water Return
Fire Protection	Red	Fire Protection
Automatic	Red	Fire
Sprinkler		Sprinkler
Gas	Yellow	Natural Gas
Compressed Air	Blue	Compressed Air
Oxygen	Yellow	Oxygen
Nitrogen	Green	Nitrogen
Deionized Water	Green	Deionized Water

C. Pipe Painting:

1. All piping exposed to view shall be painted as indicated or as directed by the Architect in the field. Confirm all color selections with Architect prior to installation.
2. The entire fire protection piping system shall be painted red.
3. All piping located in mechanical rooms and exterior piping shall be painted as indicated below:

<u>System</u>	<u>Color</u>
Storm Sewer	White
Sanitary Sewer Waste and Vent	Light Gray
Domestic Cold Water	Dark Blue
Domestic Hot Water Supply and Return	Orange

PART 3 - EXECUTION

- 3.01 All labeling equipment shall be installed as per manufacturers printed installation instructions.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Contractor's price shall include all items required as per manufacturers' requirements.
- 3.03 All piping shall be cleaned of rust, dirt, oil and all other contaminants prior to painting. Install primer and a quality latex paint over all surfaces of pipe.

END OF SECTION

SECTION 22 07 16 – PLUMBING EQUIPMENT INSULATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

- A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.
- B. Work specified elsewhere.
 - 1. Basic materials and methods.
 - 2. Piping systems.
 - 3. Air distribution equipment.

1.03 WARRANTY

- A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.
- B. Defects shall include, but not be limited to, the following:
 - 1. Mildewing.
 - 2. Peeling, cracking, and blistering.
 - 3. Condensation on exterior surfaces.

1.04 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. **PRODUCT DATA:** Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 DELIVERY AND STORAGE

- A. **DELIVERY:** Deliver undamaged materials in the manufacturer's unopened containers clearly labeled with flame and smoke ratings.

PART 2 - PRODUCTS

- 2.01 It is the intent of these specifications to secure superior quality workmanship resulting in an absolutely satisfactory installation of insulation from the standpoint of both function and appearance. Particular attention shall be given to valves, fittings, pumps, etc., requiring low temperature insulation to insure full thickness of insulation and proper application of the vapor seal. All flaps of vapor barrier jackets and/or canvas covering must be neatly and securely smoothed and sealed down.

- 2.02 The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed.
- 2.03 A sample quantity of each type insulation and each type application shall be installed and approval secured prior to proceeding with the main body of the work. Condensation caused by improper installation of insulation shall be corrected by Installing Contractor. Any damage caused by condensation shall be made good at no cost to the Owner or Architect/Engineer.
- 2.04 Glass fiber materials as manufactured by Owens/Corning, PPG, CSG, or Johns Manville will be acceptable, if they comply with the specifications.
- 2.05 All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to insulation) fire and smoke hazard as tested by Procedure ASTM E084, NFPA 255 and UL 723 not exceeding:
- Flame Spread 25
Smoke Developed 50
- 2.06 Accessories, such as adhesives, mastics and cements shall have the same component ratings as listed above.
- 2.07 All products or their shipping cartons shall have a label affixed, indicating flame and smoke ratings do not exceed the above requirements.

PART 3 - EXECUTION

- 3.01 All insulation shall be installed in accordance with the manufacturers recommendations and printed installation instructions.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.

END OF SECTION

SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Pipe and pipe fittings.
- B. Valves.
- C. Sanitary sewer piping system.
- D. Storm water piping system.
- E. Acid waste piping system.
- F. Domestic water piping system.
- G. Compressed air piping system.
- H. Excavation and backfill.

1.02 RELATED SECTIONS

- A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.
- B. Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping.
- C. Section 22 05 53 – Identification for Plumbing Piping and Equipment.
- D. Section 22 07 19 – Plumbing Piping Insulation.
- E. Section 22 11 19 - Plumbing Specialties.
- F. Section 22 30 00 - Plumbing Equipment.
- G. Section 22 40 00 - Plumbing Fixtures.

1.03 REFERENCES

- A. ANSI B31.1 - Power Piping.
- B. ANSI B31.9 - Building Service Piping.
- C. ASME - Boiler and Pressure Vessel Code.
- D. ASME Sec. 9 - Welding and Brazing Qualifications.
- E. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800.
- F. ASME B16.3 - Malleable Iron Threaded Fittings.
- G. ASME B16.4 - Cast Iron Threaded Fittings Class 125 and 250.
- H. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings

- I. ASTM A47 - Ferritic Malleable Iron Castings.
- J. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- K. ASTM A74 - Cast Iron Soil Pipe and Fittings.
- L. ASTM B32 - Solder Metal.
- M. ASTM B42 - Seamless Copper Pipe.
- N. ASTM B306 - Copper Drainage Tube (DWV).
- O. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.
- P. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
- Q. ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- R. ASTM D2564 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- S. ASTM D2729 - Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- T. ASTM D2846 - Chlorinated Polyvinyl Chloride (CPVC) Pipe, Fittings, Solvent Cements and Adhesives for Potable Hot Water Systems.
- U. ASTM F493 - Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
- V. AWWA C111- Rubber-Gasket Joints for Ductile Iron and Gray-Iron Pressure Pipe and Fittings.
- W. AWWA C651 - Disinfecting Water Mains.
- X. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary Systems.
- Y. CISPI 310 - Joints for Hubless Cast Iron Sanitary Systems.
- Z. ASSE 1003 Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems.

1.04 SUBMITTALS

- A. Submit under provisions of Division One.
- B. Product Data: Provide data on pipe materials, Pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division One.
- B. Record actual locations of valves.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division One.

- B. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.07 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating cast or marked on valve body.
- B. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.
- C. Welders Certification: In accordance with ASME Sec 9.
- D. Foreign pipe, fittings or valves are unacceptable.
- E. Piping shall be labeled along entire length indicating size, class, material specification, manufacturers name and country of origin.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 5 years documented experience and must be a domestic manufacturer.
- B. Installer: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.09 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with plumbing and building codes having jurisdiction.
- B. Conform to applicable codes for the provision and installation of all required backflow prevention devices.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.
- D. No PVC pipe or fittings will be allowed for any areas where pipe is to penetrate a fire rated assembly or to be installed in a return air plenum unless the entire length of all such piping is encased within a minimum 2 hour fire rated enclosure.
- E. Provide pressure regulating valve, maintaining 50 to 55 psi building service pressure, when supply pressure at building is greater than 70 psi.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Division One.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Tape will not be allowed as an acceptable end cover.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of Division One.
- B. Provide two repacking kits for each size valve.

PART 2 - PRODUCTS

2.01 SANITARY SOIL WASTE AND VENT PIPING, BURIED BEYOND 5 FEET OUTSIDE OF BUILDING

- A. PVC Pipe: ASTM D 1785/D 2729 schedule 40; installed per ASTM D 2321.
 - 1. Fittings: PVC, ASTM D 3311/D 2665 drainage pattern, with bell and spigot ends. Furnished by the same manufacturer as pipe or approved equal.
 - 2. Joints: solvent weld with ASTM D 2564 solvent cement, installed per the requirements of ASTM D 2855.
- B. PVC pipe: ASTM D 3034, SDR 35; installed per ASTM D 2321.
 - 1. Fittings: ASTM F 1336 PVC, drainage pattern, with bell and spigot ends. Furnished by the same manufacturer as pipe or approved equal.
 - 2. Joints: ASTM F 477 or F 913, elastomeric gaskets or solvent weld.

2.02 SANITARY SOIL, WASTE AND VENT PIPING, BURIED WITHIN 5 FEET OF BUILDING, BELOW GRADE

- A. PVC Pipe: ASTM D 1785/D 2665 schedule 40
 - 1. Fittings: PVC, ASTM D 3311/D 2665 drainage pattern, with bell and spigot ends to be furnished by the same manufacturer as pipe or approved equal.
 - 2. Joints: solvent weld with ASTM D 2564 solvent cement, clear, medium bodied, for sizes 3" and smaller and gray, heavy bodied, for sizes 4" and larger, mating surfaces shall be prepared with ASTM F 656 purple primer immediately prior to cement application.

2.03 SANITARY SOIL, WASTE AND VENT PIPING, WITHIN BUILDING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A 74 service weight.
 - 1. Fittings: Cast iron, ASTM A 74 drainage pattern.
 - 2. Joints: Hub and spigot, ASTM C 564 neoprene, compression type gaskets or lead and oakum.
- B. Copper Tubing: ASTM B 306, DWV, sizes 2" and smaller.
 - 1. Fittings: ASME B 16.23 cast bronze, or ASME B16.29, wrought copper.
 - 2. Joints: ASTM B 32, solder, Grade 50B.

- C. Brass Pipe: ASTM B 43, chrome plated.
 - 1. Fittings: ASME B 16.23 cast bronze, chrome plated.
 - 2. Joints: ASTM B 32, solder, Grade 50B.
- D. Steel Pipe: ASTM A 53, Schedule 40, galvanized, sizes 2-1/2" and smaller, for waste and vent piping only, steel soil pipes not permitted.
 - 1. Fittings: Malleable iron, galvanized.
 - 2. Joints: ASME B16.3 screwed.

2.04 STORM WATER PIPING, BURIED BEYOND 5 FEET OUTSIDE OF BUILDING

- A. Cast Iron Pipe: ASTM A 74 service weight.
 - 1. Fittings: Cast iron, ASTM A 74 drainage pattern.
 - 2. Joints: Hub and spigot, ASTM C 564 neoprene, compression type gaskets or lead and oakum.

2.05 STORM WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING, BELOW GRADE

- A. Cast Iron Pipe: ASTM A 74 service weight.
 - 1. Fittings: Cast iron, ASTM A 74 drainage pattern.
 - 2. Joints: Hub and spigot, ASTM C 564 neoprene, compression type gaskets or lead and oakum.

2.06 STORM WATER PIPING, WITHIN BUILDING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A 74 service weight.
 - 1. Fittings: Cast iron, ASTM A 74 drainage pattern.
 - 2. Joints: Hub and spigot, ASTM C 564 neoprene, compression type gaskets or lead and oakum.
- B. Cast Iron Pipe: ASTM A 888, hubless, service weight.
 - 1. Fittings: Cast iron, ASTM A 888 drainage pattern.
 - 2. Joints: No hub,
 - a. Standard Service (building of two stories in height or less): CISPI 310, ASTM C 564 neoprene gaskets and standard stainless steel clamp and solid shield assemblies constructed of type 300 series stainless steel.
 - b. Heavy duty service (building over two stories and joints 6" and larger only): CISPI 310, ASTM C 564 neoprene gaskets and wide body stainless steel clamp and solid shield assemblies constructed of type 300 series stainless steel.
 - c. Clamp assemblies shall conform to FM 1680 where required by the administrative authority.
 - d. Torque all clamps as indicated by manufacturer.

2.07 ACID WASTE PIPING SYSTEM:

- A. ACID WASTE BELOW GRADE

1. Schedule 40, ASTM D4101 acid resistant polypropylene pipe and fittings with full socket fusion weld joints, Orion or approved equal GSR Fuseal, Enfield and Zurn.

B. ACID WASTE PIPING, ABOVE GRADE

1. Acid Waste Above Grade (exposed or IN return air plenum):
 - a. Schedule 40, ASTM D3222, E84, acid and fire resistant PVDF polyvinylidene fluoride pipe and fittings with full socket fusion weld joints, Orion or approved equal George Fischer, Enfield and Zurn. Or piping may be Schott Scientific/Kimax, U.L classified chemically resistant borosilicate glass. Pipe, pipe fittings and appurtenances shall meet ASTM specifications E-438 type I, class A, C 1053-85 and federal specification No. DD-G-541B. .
2. Acid Waste Above Grade (concealed and NOT in return air plenum):
 - a. Schedule 40, ASTM D4101, ASTM E84, acid resistant, flame retardant, polypropylene pipe. Orion or approved equal George Fischer, Enfield and Zurn. Or piping may be Schott Scientific/Kimax, U.L classified chemically resistant borosilicate glass. Pipe, pipe fittings and appurtenances shall meet ASTM specifications E-438 type I, class A, C 1053-85 and federal specification No. DD-G-541B.
 - b. Fittings for plastic piping concealed within walls or inaccessible millwork shall be full socket fusion welded type
 - c. Fittings for plastic piping exposed within rooms or equipment chases or within millwork designed for piping access and piping accessible below all fixtures including fixture traps and trap arms, shall be of mechanical joint type.
 - d. Fixture traps for acid waste system shall be fully accessible drum or bottle type with mechanical joints.
 - e. Fittings for glass piping shall be joined with bead to bead and bead to plain end, couplings shall be series 300 stainless steel clamps with Buna-N compression liner and TFE sealing ring.

2.08 DOMESTIC WATER PIPING, BURIED BEYOND 5 FEET OUTSIDE OF BUILDING

Copper Pipe: ASTM B 88, Type K, hard drawn.

1. Fittings: ASME B 16.18, cast bronze, or ASTM B 16.22 wrought copper alloy.
2. Joints: ASTM B 32, solder.

B. Ductile Iron Pipe: ANSI/AWWA C151.

1. Fittings: Ductile or gray cast iron, standard thickness.
2. Joints: ANSI/AWWA C111, rubber gasket with 3/4 inch diameter rods.

2.09 DOMESTIC WATER PIPE, BURIED WITHIN 5 FEET OF BUILDING, BELOW GRADE

A. Copper Tubing: ASTM B 88, Type K, soft annealed.

1. Fittings: ASME B 16.18, cast bronze, ASTM B 16.22 wrought copper alloy or ASTM B 16.26 cast bronze for flared fittings.
2. Joints: Sweat solder or flared. Note: No joints will be permitted in pressure water pipe below slab on grade. All such piping must be brought up above finished floor line a minimum of 12" before joining. Exception may be taken when pipe is fully enclosed in pressure rated sleeve and pre-approved by the Architect and Engineer.

- B. Ductile Iron Pipe: ANSI/AWWA C151.
 - 1. Fittings: Ductile or gray cast iron, standard thickness.
 - 2. Joints: ANSI/AWWA C111, rubber gasket with 3/4 inch diameter rods. Note: No joints are to be permitted in pressure water pipe below slab on grade except at exterior wall pipe entry from below floor.

2.10 DOMESTIC WATER PIPING, WITHIN BUILDING, ABOVE GRADE

- A. Copper Tubing: ASTM B 88, Type L, hard drawn.
 - 1. Fittings: ASME B 16.18, cast bronze, or ASTM B 16.22 wrought copper alloy.
 - 2. Joints: ASTM B 32, solder.

2.11 EXCAVATION AND BACKFILL

- A. This section shall govern for all excavation and soil testing for the construction and laying of all sewers.
- B. Excavation:
 - 1. Excavate trenches for underground piping to the required depth to ensure 2 foot minimum coverage over piping unless noted otherwise.
 - 2. The bottom of the trench or excavation shall be cut to a uniform grade.
 - 3. Should rock be encountered, excavate 6 inches below grade, fill with bedding material and temp to existing density.
 - 4. Coordinate alignment of pipe trenches to avoid obstructions. Assure that proposed routing of pipe will not interfere with building foundation before any trenching has begun. Should conflicts occur, contact Architect/Engineer before proceeding.
- C. Backfill:
 - 1. Backfill shall not be placed until the work has been inspected, tested and approved. Complete backfill to the surface of natural ground or to the lines and grades indicated on drawings. Use 6 inch stabilized sand bed with 4 inch stabilized sand cover around each pipe and select fill up to finished surface or grade.
 - 2. Compacting Backfill: Place material in uniform layers of 8 inches maximum, loose measure and compact to not less than 95% of maximum soil density as determined by ASTM D-698 Standard Proctor.
 - 3. Restoration: Compact backfill , where trenching or excavation is required in improved areas such as pavements, walks and similar areas, to a condition equal to the adjacent undisturbed earth and restore surface of the area to the condition existing prior to trenching or excavating operation.
 - 4. A clay fill "trench plug" extending 3 feet inside the building line and 5 feet outside the building line shall be placed to completely surround utility lines passing beneath the foundation and grade beam. The materials shall consist of on-site soils with a plasticity index (PI) between 30 and 40 percent compacted to at least 95 percent of the Standard Proctor and maximum dry density as determined by ASTM D-698.

2.12 FLANGES, UNIONS AND COUPLINGS

- A. Pipe size 2 inches and under:
 - 1. Ferrous pipe: ANSI B16.39, 150 psig malleable iron threaded unions.

2. Copper tube and pipe: 150 psig bronze unions with soldered ends.
 3. Ferrous pipe: ANSI B16.5, 150 psig forged steel flanges; screwed neck, 1/16" thick preformed neoprene gaskets.
- B. Pipe size 2-1/2 inches and larger:
1. Ferrous pipe: 150 psig forged steel slip-on flanges; weld neck, 1/16" thick preformed neoprene gaskets.
 2. Copper tube and pipe: 150 psig slip-on bronze flanges; 1/16" thick preformed neoprene gaskets.
- C. Dielectric Connections:
1. Pipe size 2 inches and under: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 2. Pipe size 2-1/2 inch and larger: flange, connection as above, with water impervious isolation barrier.
- D. Mechanical Couplings:
1. Grooved mechanical pipe couplings, fittings, valves and other grooved components may be used as an option to soldered or braised methods. Fittings shall be cast of bronze for copper tubing systems. All grooved components shall be of one domestic manufacturer, and conform to local code approval and/or as listed by ANSI-B-31, B-31.3M B-31.9, ASME, UL/ULC, FM, IAPMO OR BOCA. Grooved end manufacturer to be ISO-9001 certified. Grooved couplings shall meet the requirements of ASTM F-1476. Manufacturer shall be Victaulic or approved equal.

2.13 GATE VALVES

- A. Manufacturers:
1. Nibco No. T-111 up to 2-1/2"; F-617-O 3" and over.
 2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 428 up to 2-1/2"; 465-1/2 3" and over.
 - b. Stockham No. B-100 up to 2-1/2"; G-623 3" and over.
 - c. Grinnell No. 3010 up to 2-1/2"; 6020A 3" and over.
- B. Up to and including 2-1/2" Inches: Bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge threaded ends.
- C. Over 3" Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, solid wedge, flanged ends.
- D. Provide bronze tee or cast iron square nut operator for all valves installed below ground.
1. Valves 2-1/2" and smaller shall be equipped with ASTM B62 solid red bronze tee securely affixed to the valve stem.
 2. Valves 3" and larger shall be equipped with a standard 2" square combination nut/socket securely affixed to the valve stem.
 3. Provide owner with two extended tee handle operating wrenches for each type of valve head installed.

2.14 BALL VALVES

- A. Manufacturers:

1. Nibco No. T-585-70-66
 2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 9303-B
 - b. Stockham Model S-216BR-1R-T
 - c. Grinnell No. 3700-6
- B. Up to and including 2 Inches: Bronze two 600 PSI piece body full port, stainless steel ball and stem, Teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends with union.
- C. Ball valves used for balancing shall have memory stops.

2.15 SWING CHECK VALVES

- A. Manufacturers:
1. Nibco No. T-413-B up to 2-1/2"; F-918 3" and over.
 2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 37 up to 2-1/2"; 372 3" and over.
 - b. Stockham No. B-319; up to 2-1/2"; G931 3" and over.
 - c. Grinnell No. 3300 up to 2-1/2"; 6300A 3" and over.
- B. Up to and including 2-1/2 Inches: Bronze swing disc, screwed ends.
- C. Over 2-1/2 Inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends. Include outside lever and adjustable weight where required for quiet operation.

2.16 SPRING LOADED (SILENT) CHECK VALVES

- A. Manufacturers:
1. Nibco No. W-910
 2. Other acceptable manufacturers offering equivalent products.
 - a. Grinnell No. 402
- B. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer, or flanged ends.

2.17 REGULATING VALVES

- A. Manufacturers:
- a. Watts No. 223-S up to 2-1/2" size valve.
 - b. Watts No. F127W for 3" and Watts No. F127W-WR for 4" size valve.
 - c. Other acceptable manufacturers offering equivalent products.
- B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.
- C. Provide and install pressure regulating valves with inlet strainer and union fittings individually or as integral components of regulator.
- D. Install pressure regulating valve within building immediately downstream of building shut-off valve and prior to any building service branch connection. Each building service PRV installation shall include an integral permanent bypass assembly with a normally closed

bypass throttling globe or ball valve.

2.18 SOLDER

- A. 95.5% tin, 4% copper, 0.5% silver.
- B. Lead free, antimony free, zinc-free.
- C. Silvabrite 100, by Engelhard Corporation or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Coordinate and verify excavations under provisions of Division Two.
- B. Verify that all excavations are to the required grade, dry, and not over-excavated.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale, oil and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Install, clean bank sand backfill in trench to a minimum of 6 inches below pipe, and to cover all piping a minimum of 12 inches above pipe.

3.03 INSTALLATION

- A. Install all materials in accordance with manufacturer's published instructions.
- B. All exposed sewer and water pipe in toilet rooms or other finished areas of the building shall be chromium plated.
- C. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- D. Route piping in orderly manner, parallel and perpendicular to building column grid lines, unless indicated otherwise on drawings, and maintain gradients.
- E. Install piping to conserve building space and not conflict with other trades or interfere with intended use of space.
- F. Group piping whenever practical at common elevations.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Provide clearance for installation of insulation and access to valves and fittings. Valves installed beyond reasonable reach shall be provided with chain operator.
- I. Provide access doors where valves and operable fittings are not exposed. Access doors shall be of approved types set in locations pre-approved by submittal to the Architect.

- J. Establish elevations of buried piping outside the building to ensure not less than 2 feet of cover, or maximum depth of frost penetration, whichever is the greater.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- L. Provide encasement for and support of utility meters in accordance with requirements of utility companies.
- M. Gate valves installed below grade shall be covered with an adjustable cast iron roadway box extended to grade. Cover shall be cast iron with 'water' cast on top and set flush to finished paving or 2" above finished earthen grade. Box shall be supported from undisturbed soil or concrete base and shall not introduce any stress to piping under all traffic conditions.
- N. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting.
- O. Excavate in accordance with Division 22.
- P. Backfill in accordance with Division 22.
- Q. Install bell and spigot pipe with bell end upstream.
- R. Maintain uniformity in the installation of piping materials and joining methods. Do not mix materials types.
- S. Install valves with stems upright or horizontal, not inverted.
- T. Solder joints shall be wiped clean at each joint, remove excess metal while molten and flux residue when cooled.
- U. No PVC pipe or fittings will be allowed for any areas where pipe is installed in return air plenum unless the entire length of all such piping is encased within a minimum 2 hour fire rated enclosure.
- V. Installation of solvent cement joints for PVC piping shall be in strict conformity to the requirements outlined in ASTM D 2855.
- W. Waste nipple from wall to tapped tee shall be schedule 40 threaded galvanized steel pipe or brass or copper with threaded adapter.
- X. Provide approved PVC slip by cast iron no hub adaptor at each transition from underground PVC piping to above ground cast iron pipe using heavy duty wide bodied no hub couplings as specified elsewhere in this section. Transition shall be made as close as possible to floor for sanitary DWV piping systems and at test tee "minimum 12 in. A.F.F." for storm drainage piping. Support vertical cast iron pipe from floor anchors using riser clamp and galvanized all thread rod as specified in section 15140.
- Y. Provide bracing to prevent axial movement for all storm drainage piping above ground floor. Provide restraints for all drainage piping at all changes in direction and at all diameter changes greater than two pipe sizes. Braces blocks, rodding and other permanent methods as prescribed by cast iron soil pipe institute.
- Z. All grooved components (couplings, fittings, valves, gaskets and specialties) shall be of one domestic manufacturer.

- AA. Grooved manufacturer shall provide on-site training for contractor's field personnel by a factory trained representative in the proper use of grooving tools, application of groove, and product installation. Factory trained representative shall periodically visit the job site and inspect installation. Contractor shall remove and replace any improperly installed products.

3.04 APPLICATION

- A. Install union downstream of all valves at equipment or apparatus connections.
- B. Install male adapters each side of threaded valves in copper piped system. Sweat solder adapters to tube prior to make-up of threaded connections.
- C. Install ball valves for shut-off and to isolate all equipment items, distinct parts of systems, or vertical risers.
- D. Each plumbing fixture shall have a shut-off valve on each hot water and cold water supply line.
- E. Each plumbing water rough-in stub out shall be fitted with a shut off valve.
- F. Install globe, ball or butterfly valves for throttling, bypass, or balancing (manual flow control) services.
- G. Ball valves installed in insulated piping shall be fitted with extended lever operators of sufficient length to raise handle above the insulation jacket material. Where valve is used for throttling service valve handle shall be equipped with adjustable memory stop device.
- H. Provide spring loaded, non-slam, check valves on discharge of water pumps.

3.05 ERECTION TOLERANCES

- A. All drainage lines in the building shall have 1/4 inch to the foot fall where possible and not less than 1/8 inch to the foot fall toward the main sewer. Pipe must be so laid that the slope will be uniform and continuous. Permission shall be secured from the Architect and Engineer before proceeding with any Work where existing conditions prevent the installation at minimum grade specified.
- B. Slope all water piping and arrange to drain at low points. Provide loose key operated, polished chrome, sill cock flush to wall where fixture stop will not suffice for this requirement.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, all domestic water systems shall be complete, thoroughly flushed clean and free of all foreign matter or erection residue.
- B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. On building side of the main shut off valve, provide a 3/4" connection through which chlorine can be introduced into the water piping
- D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, in sufficient quantity to obtain 50 to 80 mg/L residual free chlorine solution throughout the entire domestic water piping systems.

- E. Bleed water from outlets as required to ensure complete distribution and test for disinfectant residual at a minimum 15 percent of total outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 5 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

- A. Provide new sanitary and storm sewer services connecting to existing building services or utility lines as shown on the drawings.
- B. Before commencing work, field verify invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover as required.
- C. Provide new domestic water service connecting to existing building services or utility lines as shown on plans. Assure connections are in compliance with requirements of the jurisdiction having authority.
- D. Extension of services to the building shall be fabricated from the same materials as the utility service lines or those materials specified herein.
- E. Should points of connection vary from those indicated on the drawings contractor shall properly allow for this in the actual connections field fabricated.

3.08 RODDING SEWERS

- A. All sanitary soil and waste lines, both in the building and out, shall be rodded out after completion of the installation.
- B. This Work shall be done, as part of the contract, to make certain that all lines are clear, and any obstruction that may be discovered shall be removed immediately. Rodding shall be accomplished by utilizing a rotary cutter, which shall be full size of pipe being cleaned.

3.09 TESTING OF PLUMBING PIPING SYSTEMS

- A. During the progress of the work and upon completion, tests shall be made as specified herein and as required by Authorities Having Jurisdiction, including Inspectors, Owner or Architect. The Architect or duly authorized Construction Inspector shall be notified in writing at least 2 working days prior to each test or other Specification requirement which requires action on the part of the Construction Inspector.
- B. Tests shall be conducted as part of this work and shall include all necessary instruments, equipment, apparatus, and service as required to perform the tests with qualified personnel. Submit proposed test procedures, recording forms, and test equipment for approval prior to the execution of testing.
- C. Tests shall be performed before piping of various systems have been covered or furred-in. For insulated piping systems testing shall be accomplished prior to the application of insulation.

- D. All piping systems shall be tested and proved absolutely tight for a period of not less than 24 hours. Tests shall be witnessed by the Architect or an authorized representative and pronounced satisfactory before pressure is removed or any water drawn off.
- E. Leaks, damage or defects discovered or resulting from test shall be repaired or replaced to a like new condition. Leaking pipe joints, or defective pipe, shall be removed and replaced with acceptable materials. Test shall be repeated after repairs are completed and shall continue until such time as the entire test period expires without the discovery of any leaks.
- F. Wherever conditions permit, each piping system shall thereafter be subjected to its normal operating pressure and temperature for a period of no less than five 5 days. During that period, it shall be kept under the most careful observation. The piping systems must demonstrate the propriety of their installation by remaining absolutely tight during this period.
- G. Domestic Water:
 - 1. Pressure test at one and one half times the normal working pressure or 125 psig, which ever is the greater, for 24 hours.
- H. Sanitary Soil, Waste and Vents and Storm Sewer:
 - 1. After the rough-in soil, waste and vent and other parts of the sanitary sewer including branch laterals have been set from the lowest level, at point of connection to existing utility lines, to above the floor line, all outlets shall be temporarily plugged or capped, except as are required for testing as described herein. Ground work shall not permit the backfill of trenches to cover any joints until the completion of testing. Back fill shall be limited to mid sections of full joints of piping only. For pipe in ground the piping shall be readied as described herein and filled with water to a verifiable and visible level to 10' above the lowest portions of the system being tested.
 - 2. On multi-level buildings only one floor level shall be tested at a time. Each floor shall be tested from a level below the structure of the floor, or the outlet of the building in the case of the lowest level, to a level of 12 inches above the floor immediately above the floor being tested, or the top of the highest vent in the case of the highest building level. The pipes for the level being tested shall be filled with water to a verifiable and visible level as described above and be allowed to remain so for 24 hours. If after 24 hours the level of the water has been lowered by leakage, the leaks must be found and stopped, and the water level shall again be raised to the level described, and the test repeated until, after a 24 hour retention period, there shall be no perceptible lowering of the water level in the system being tested.
 - 3. Should the completion of these tests leave any reasonable question or doubt of the integrity of the installation, additional tests including peppermint smoke, or other measures shall be performed to demonstrate the reliability of these systems to the complete satisfaction of the Owner's duly authorized representative. Such tests shall be conducted and completed before any joints in plumbing are concealed or made inaccessible.

3.10 COMPLETE FUNCTIONING OF WORK

- A. All work fairly implied as essential to the complete functioning of the systems shown on the Drawings and Specification shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specification to establish the type and function of systems but not to set forth each item essential to the functioning of any system. In case of doubt as to the work intended or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for Supplementary Instructions and Drawings, etc.

END OF SECTION

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

- A. **WORK INCLUDED:** Include the following Work in addition to items normally part of this Section:
 - 1. Plumbing fixtures.
 - 2. Drains and cleanouts.
- B. **WORK SPECIFIED ELSEWHERE:**
 - 1. Piping systems.
 - 2. Pipe valves and fittings.
 - 3. Plumbing systems testing.

1.03 WARRANTY

- A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.
- B. Defects shall include, but not be limited to, the following:
 - 1. Noisy operation.
 - 2. Noticeable deterioration of finish.
 - 3. Leakage of water.

1.04 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. **PRODUCT DATA:** Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.
- C. **OPERATION AND MAINTENANCE INSTRUCTIONS:** Provide pre-printed operating and maintenance instructions for each item specified. Instruct and demonstrate the proper operation and maintenance to the Owner's designated representative.

1.05 DELIVERY AND STORAGE

- A. **DELIVERY:** Deliver clearly labeled, undamaged materials in the manufacturers' unopened

containers.

- B. TIMING AND COORDINATION: Deliver materials to allow for minimum storage time at the project site. Coordinate delivery with the scheduled time of installation.
- C. STORAGE: Store materials in a clean, dry location, protected from weather and abuse.

1.06 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.
- B. Confirm and field coordinate that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

PART 2 - PRODUCTS

2.01 MATERIALS

A. PLUMBING FIXTURES:

1. GENERAL: Provide plumbing fixtures as specified on drawings. The approved equal products manufacturers are as follows:
 - a. Water closet, urinals, lavatories, bath tubs and showers: American Standard, Kohler, Eljer.
 - b. Stainless steel sinks: Elkay, Just and Moen.
 - c. Mop sinks: Stern-Williams, Fiat
 - d. Faucets: American Standard, Kohler, Eljer.
 - e. Faucets: Chicago, T&S Brass, Zurn
 - f. Faucets: Moen, Delta Commercial, Speakman
 - g. Shower valves: Leonard, Powers, Symmons, Chicago, Speakman.
 - h. Shower Systems: Bradley, Acorn
 - i. Flush Valves: Sloan "Royal"
 - j. Flush Valves: Sloan "Regal Pro", Zurn "AquaVantage"
 - k. Flush Valves: Sloan "Regal", Zurn "AquaFlush"
 - l. Drinking fountains: Halsey Taylor, Elkay, Haws, Oasis and Sunroc.
 - m. Floor drains and roof drains: Zurn, J.R. Smith, Mifab, Josam and Wade.
 - n. Emergency Fixtures: Bradley, Chicago, Haws, Speakman and Encon
 - o. Trap Primers: PPP inc. (All brass construction). Sioux Chief.
2. CHAIR CARRIERS: ANSI/ASME A112.6.1.; Adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers. As manufactured by Zurn, J. R. Smith, Josam or Wade.
3. DRINKING FOUNTAIN & URINAL WALL SUPPORTS: ANSI/ASME A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs. As manufactured by Zurn, J. R. Smith, Josam or Wade.
4. TRAPS, STOPS AND RISERS: Heavy pattern as manufactured by McGuire, Chicago or Zurn.

B. CLEANOUTS:

1. GENERAL: Provide cleanouts as shown on Drawings and as required by the city building code.
2. ACCEPTABLE MANUFACTURERS: Zurn, J. R. Smith, Mifab, Josam and Wade.
3. TYPES:
 - a. FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable floor level

- b. assembly with round nickel bronze top and gasket cover.
RESILIENT OR TILE FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable assembly with round nickel-bronze top with gasketed water tight cover and depressed top to receive flooring finish material.
- c. DRY WALL CLEANOUTS: Provide cast iron tee and counter sink bronze plug with square nickel bronze frame and stainless steel cover.
- d. Provide membrane clamp rings for slab on grade cleanouts.
- e. All cleanouts shall have tapered bronze plugs.
- f. All cleanouts outside of building on grade shall be set in a 18" x 18" x 4" thick concrete pad.

PART 3 - EXECUTION

3.01 PREPARATION

- A. EXAMINATION OF CONDITIONS: Examine conditions affecting this Work. Report unsatisfactory conditions to the proper authority and do not proceed until those conditions have been corrected. Commencing Work implies acceptance of existing conditions as satisfactory to the outcome of this Work.

3.02 INSTALLATION

- A. Install fixtures in locations and heights as shown on Drawings or as directed by the Architect.
- B. Install materials plumb, level, securely, and in accordance with manufacturer's recommendations.
- C. All rough-in pipe openings, for final connections with all supply waste soil and vent systems shall be closed with caps or plugs during early stages of construction and installation. Tape shall not be considered sufficient protection.
- D. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.
- E. Provide gate valves in piping serving batteries of fixtures. Label stops "Hot" and "Cold." Valves to be located above accessible ceiling. If ceiling are not accessible, provide access panels of adequate size to make valves fully accessible.
- F. Plumbing fixtures shall be supported by a concealed chair carrier where required to properly support the fixture specified. All carriers to be securely mounted, bolted and checked prior to concealment.
- G. Caulk around fixtures with best grade white silicone caulking. Do not use grout.
- H. All handles on supply and drainage fittings or other brass items shall be properly lined up and adjusted. Fittings shall not be left in any haphazard manner.
- I. All fixtures shall have individual chrome plated loose key cutoff stops on supply lines. Where same are not specified as a part of the fixture trim, they shall be installed as close to fixtures as possible in the hot and cold water supply.
- J. Install each fixture with trap, easily removable for servicing and cleaning.
- K. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

- L. Hot and cold water riser air chambers: Provide air chambers for hot and/or cold water riser located at the rough-in tee at all fixtures.

The air chamber shall be of the same materials and the next larger diameter than the required rough-in supply pipe and a minimum of 24" tall.

The contractor may install water hammer arrestors in lieu of air chambers. Water hammer arrestors shall be PDI Certified and sized and placed as recommended by manufacture. Provide an accessible isolation valve and proper access to arrestor for replacement.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.04 ADJUSTING

- A. Adjust work under provisions of Division One.
- B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean work under provisions of Division One.
- B. At completion clean plumbing fixtures and equipment.

3.06 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Division One.
- B. Do not permit use of fixtures.

3.07 ADA ACCESSIBLE FIXTURES

- A. Install fixtures to heights, indicated on architectural drawings.
- B. Handicapped fixtures shall be installed to required heights, shall be of types suitable for, and supplied with controls properly installed, to comply with requirements as directed by ADA Accessibility of Federal Registry, Part III, Department of Justice 28 CFR 36 and comply with all state and local ADA Code requirements.
- C. Exposed accessible sink or lavatory p-trap and angle valve assemblies shall be insulated with the fully molded, Truebro, Handi Lav-guard insulation kit. Provide the proper model for fixtures specified. All kits shall be White or as selected by Architect.
- D. Wall mounted drinking fountains and coolers which protrude into passages or corridor space, whether single or paired with adjacent accessible fixture, shall be supplied with skirt or apron to lower the underside clearance of non-accessible fixture equal to that required for accessible fixture.

END OF SECTION

SECTION 23 02 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.
- C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect, expressed in writing, is equal to that specified.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.
- C. The approximate locations of Mechanical (HVAC) items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.
- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the

discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.
- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".
- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.
- B. All duct or pipe or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit shop drawings for approval.
- C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the contractor at no additional cost to the owner.
- D. Additional coordination with electrical contractor may be required to allow adequate clearances of electrical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

- A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.
- B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

- A. Finish painting is specified. Prime and protective painting are included in the work of this Division.
- B. Owner and General Contractor furnished equipment shall be properly connected to Mechanical (HVAC) systems.
- C. Furnishing and installing all required Mechanical (HVAC) equipment control relays and electrical interlock devices, conduit, wire and J-boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

- A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.
- C. Damaged equipment, duct or pipe shall be promptly removed from the site and new, undamaged equipment, pipe and duct shall be installed in its place promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

- A. The heating, ventilating and air conditioning systems, and the component parts there of, shall be guaranteed to operate without objectionable noise and vibration.
- B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the Building structure, piping and other items.
- C. Carefully fabricate ductwork and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.
- D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

- A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.
- B. Arrange with the serving utility companies for the connection of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.
- C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements which includes and is not limited to the following nationally accepted codes and standards:
 - 1. Air Moving & Conditioning Association, AMCA.
 - 2. American Standards Association, ASA.
 - 3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
 - 4. American Society of Mechanical Engineers, ASME.
 - 5. American Society of Plumbing Engineers, ASPE.
 - 6. American Society of Testing Materials, ASTM.
 - 7. American Water Works Association, AWWA.
 - 8. National Bureau of Standards, NBS.
 - 9. National Fire Protection Association, NFPA.
 - 10. Sheet Metal & Air Conditioning Contractors' National Association, SMACNA.
 - 11. Underwriters' Laboratories, Inc., UL.
 - 12. International Energy Conservation Code, IECC.
 - 13. International Fire Code.
 - 14. International Gas Code.
- D. Where differences existing between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the listed nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Engineer in writing of all differences.
- E. When directed in writing by the Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, correct the deficiencies, and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.
- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of

helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.
- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.
- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.
- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.
- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first

instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

- A. These Specifications are intended to supplement the Drawings and it will not be the province of the Specifications to mention any part of the work which the Drawings are competent to fully explain in every particular and such omission is not to relieve the Contractor from carrying out portions indicated on the Drawings only.
- B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least 7 working days prior to bid opening date for issuance of an addendum.
- C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.
- D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.
- E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing 10 days prior to the bid date without fail.
- F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.
- G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equal construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.
- H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUAL" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUAL" product,

material or method may be used if it complies with the specifications and is submitted for review to the Engineer as outline herein.

- I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical (HVAC) Design Documents and all other trades, including Division 26.
- J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected subcontractors shall be the responsibility of this bidder and not the owner.
- K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.
- L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with above and if accepted, will issue a letter allowing the substitutions.
- M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades and pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

- A. Coordinate with Division 1 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or mylar in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:
 - 1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
 - 2. An index page with a listing of all data included in the Submittal.
 - 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated

with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.

4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
 6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".
- B. Refer to Division 1 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.
- D. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
 2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
 3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
 4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous

- shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. **CONTRACTOR'S CERTIFICATION REQUIRED:** Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. **MANUFACTURER NOT AS SPECIFIED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.
- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Submittals are required for, but not limited to, the following items:
1. Pipe Material and Specialties.
 2. Pipe Fabrication Drawings.
 3. Basic Materials.
 4. Variable Air Volume Boxes.
 5. Air Handling Units.
 6. Cooling Towers.
 7. Chillers.
 8. Air Cooled Condensing Units.
 9. Water Treatment.
 10. Expansion Compensation.
 11. Variable Frequency Drives.
 12. Noise and Vibration Controls.
 13. HVAC Pipe and Duct Insulation.
 14. Hydronic Valves.
 15. Hydronic Piping and Accessories.
 16. Hydronic Pumps.
 17. Roof-Top A/C Units.
 18. Heating Water Boiler.
 19. Portable Pipe Hanger and Equipment Supports.
 20. Duct Specialties.
 21. Duct Fabrication Drawings.
 22. Air Distribution Devices.
 23. Fan Coil Units.
 24. Filters.
 25. Fans.
 26. Fire Dampers and Fire Smoke Dampers.
 27. Temperature Controls and Control Sequences.
 28. Test, Adjust and Balance Reports.
 29. Testing, Adjusting and Balancing Contractor Qualifications.
 30. Coordination Drawings.

- I. Refer to other Division 23 sections for additional shop drawing requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
 - a. Wall and type locations.
 - b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.
 - d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm and sanitary sewer piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.
 - j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.
 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.
- C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Special Project Requirements, in addition to the requirements specified in Division 23, indicate the following installed conditions:
 1. Duct mains and branches, size and location, for both exterior and interior; locations of dampers, fire dampers, duct access panels, and other control devices; filters, fuel

- fired heaters, fan coils, condensing units, and roof-top A/C units requiring periodic maintenance or repair.
2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
 3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
 5. Contract Modifications, actual equipment and materials installed.
- B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.
- C. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
- D. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.
- E. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.
- F. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
- G. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 OPERATING MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:
 - 1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 - 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 - 4. Servicing instructions and lubrication charts and schedules.

1.17 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.
- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.
- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 23.

1.18 MAINTENANCE MANUALS

- A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in "D ring type" binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼" of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Mechanical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 23 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 23, include the following information for equipment items:

1. Identifying names, name tags designations and locations for all equipment.
 2. Valve tag lists with valve number, type, color coding, location and function.
 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 4. Fabrication drawings.
 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 8. Equipment and motor name plate data.
 9. Wiring diagrams.
 10. Exploded parts views and parts lists for all equipment and devices.
 11. Color coding charts for all painted equipment and conduit.
 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.
- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.19 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 23 Sections for additional Operator Training requirements.

1.20 FINAL COMPLETION

- A. At the completion of the work, all equipment and systems shall be tested and faulty equipment and material shall be repaired or replaced. Refer to Sections of Division 23 for additional requirements.
- B. Clean and adjust all air distribution devices and replace all air filters immediately prior to final acceptance.
- C. Touch up and/or refinish all scratched equipment and devices immediately prior to final acceptance.

1.21 CONTRACTOR'S GUARANTEE

- A. Use of the HVAC systems to provide temporary service during construction period will not be allowed without permission from the Owner in writing and if granted shall not be cause warranty period to start, except as defined below.
- B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one year after its completion and final acceptance, and shall furnish free of additional cost to the Owner all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of issue of Substantial Completion, Beneficial Occupancy by the Owner or the Certificate of Final Payment as agreed upon by all parties.
- C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.
- D. All air conditioning compressors shall have parts and labor guarantees for a period of not less than 5 years beyond the date of final acceptance.
- E. Refer to Sections in Division 23 for additional guarantee or warranty requirements.

1.22 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.
- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.
- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

- F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the "CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per "CD".

The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

- G. This Five Hundred Dollars (\$500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per "CD" cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials and equipment manufactured by a domestic United States manufacturer.
- B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks.
- C. All access panels located in wet areas such as restrooms, locker rooms, shower rooms, kitchen and any other wet areas shall be constructed of stainless steel.
- D. Access Doors: shall be as follows:
 - 1. Plastic Surfaces: Milcor Style K.
 - 2. Ceramic Tile Surface: Milcor Style M.
 - 3. Drywall Surfaces: Milcor Style DW.
 - 4. Install panels only in locations approved by the Architect.

PART 3 - EXECUTION

3.01 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.
- B. Refer to equipment specifications in Divisions 2 through 48 for additional rough-in requirements.

3.02 MECHANICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and route proposed solution to the Architect for review.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curb to match roof slope. Refer to architectural drawings and details.
14. The equipment to be furnished under this Specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.
15. The architectural and structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, ducts, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Mechanical Equipment:
 - a. Mechanical equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Shop drawings shall include dimensions and lettering format for approval. Attachments shall be with escutcheon pins, self-tapping screws, or machine screws.

- b. Tags shall be attached to all valves, including control valves, with nonferrous chain. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the temperature control submittal and the "as-built" drawings.

3.03 CUTTING AND PATCHING

- A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 - 1. Uncover Work to provide for installation of ill-timed Work.
 - 2. Remove and replace defective Work.
 - 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 - 4. Remove samples of installed Work as specified for testing.
 - 5. Install equipment and materials in existing structures.
 - 6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
 - 7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Section "DEFINITIONS" for definition of "Installer."
- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, mechanical ducts and HVAC units, and other mechanical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.04 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

- A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:
 - 1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
 - 2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.

3.05 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

- A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by his contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be apart of this Contract.
- B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.
- C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe and duct pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.
- D. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.
- E. Certain work during the demolition phase of construction may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time at least seventy-two (72) hours in advance in writing.
- F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.
- G. Equipment, piping or other potential hazards to the working occupants of the building shall not be left overnight outside of the designated working or construction area.
- H. Make every effort to minimize damage to the existing building and the owner's property. Repair, patch or replace as required any damage that might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Corporate with the Owner and other trades in scheduling and performance of the work.
- I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, and ventilation services for the existing areas with a minimum of interruption.

- J. All existing pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.
- K. Pipe, duct, equipment and controls serving mechanical and owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.
- L. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.
- M. Refer to Architectural "Demolition and/or Alteration" plans for actual location of walls, ceiling, etc., being removed and/or remodeled.

END OF SECTION

SECTION 23 05 29 – HANGERS AND SUPPORT FOR PIPING AND EQUIPMENT - HVAC

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Pipe, and equipment hangers, supports and associated anchors.
- B. Sleeves and seals.
- C. Flashing and sealing equipment and pipe stacks.

1.02 RELATED WORK

- A. Section 21 00 00 – Fire Suppression.
- B. Section 22 10 00 – Plumbing Piping and Pumps.
- C. Section 23 05 48 – Vibration and Seismic Controls for HVAC Piping and Equipment.
- D. Section 23 07 16 – HVAC Equipment Insulation.
- E. Section 23 07 19 – HVAC Piping Insulation.
- F. Section 23 21 13 – Above Ground Hydronic Piping.
- G. Section 23 21 16 – Underground Hydronic Piping.

1.03 REFERENCES

- A. ANSI/ASME B31.1 - Power Piping.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems.
- C. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems.

1.04 QUALITY ASSURANCE

- A. Supports for Sprinkler Piping: In conformance with NFPA 13.
- B. Supports for Standpipes: In conformance with NFPA 14.

1.05 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division One.
- B. Indicate hanger and support framing and attachment methods.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch Malleable iron, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 to 4 Inches Carbon steel, adjustable, clevis.
- C. Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double

hanger.

- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for pipe sizes 6 inches and over.
- E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- F. Wall Support for Pipe Sizes 4 Inches and over: adjustable steel yoke and cast iron roll.
- G. Vertical Support: Steel riser clamp.
- H. Floor Support for Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.
- I. Floor Support for Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
- J. Roof Pipe Supports and Hangers: Galvanized Steel Channel System as manufactured by Portable Pipe Hangers, Inc. or approved equal.

For pipes 2-1/2" and smaller – Type PP10 with roller
For pipes 3" through 8" – Type PS
For multiple pipes – Type PSE - Custom
- K. Copper Pipe Support and Hangers: Electro-galvanized with thermoplastic elastomer cushions; Unistrut "Cush-A-Clamp" or equal. Hangers: Plastic coated; Unistrut or equal.
- L. For installation of protective shields refer to specification section 22 05 29 - 3.03.
- M. Shields for Vertical Copper Pipe Risers: Sheet lead.
- N. Pipe Rough-In Supports in Walls/Chases: Provide preformed plastic pipe supports, Sioux Chief "Pipe Titan" or equal.

2.02 HANGER RODS

- A. Galvanized Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

2.03 INSERTS

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 FLASHING

- A. Metal Flashing: 20 gage galvanized steel.
- B. Lead Flashing: 4 lb. /sq. ft. sheet lead for waterproofing; 1 lb. /sq. ft. sheet lead for soundproofing.
- C. Caps: Steel, 20 gage minimum; 16 gage at fire resistant elements.
- D. Coordinate with roofing contractor/architect for type of flashing on metal roofs.

2.05 EQUIPMENT CURBS

- A. Fabricate curbs of hot dipped galvanized steel.
- B. For metal roof construction, roof curbs shall be made of aluminum or stainless steel. Coordinate with architectural drawings and details.

2.06 SLEEVES

- A. Sleeves for Pipes through Non-fire Rated Floors: Form with 18 gage galvanized steel, tack welded to form a uniform sleeve.
- B. Sleeves for Pipes through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe, schedule 40.
- C. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated steel sleeves including seals, UL listed.
- D. Sleeves for Round Ductwork: Form with galvanized steel.
- E. Sleeves for Rectangular Ductwork: Form with galvanized steel.
- F. Fire Stopping Insulation: Glass fiber type, non-combustible, U.L. listed.
- G. Caulk: Paintable 25-year acrylic sealant.
- H. Pipe Alignment Guides: Factory fabricated, of cast semi-steel or heavy fabricated steel, consisting of bolted, two-section outer cylinder and base with two-section guiding spider that bolts tightly to pipe. Length of guides shall be as recommended by manufacturer to allow indicated travel.

2.07 FABRICATION

- A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- B. Design hangers without disengagement of supported pipe.
- C. Design roof supports without roof penetrations, flashing or damage to the roofing material.

2.08 FINISH

- A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.01 INSERTS

- A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Coordinate with structural engineer for placement of inserts.
- B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
- C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.
- D. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt

with recessed square steel plate and nut recessed into and grouted flush with slab. Verify with structural engineer prior to start of work.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

<u>PIPE SIZE</u>	<u>MAX. HANGER SPACING</u>	<u>HANGER DIAMETER</u>
(Steel Pipe)		
1/2 to 1-1/4 inch	7'-0"	3/8"
1-1/2 to 3 inch	10'-0"	3/8"
4 to 6 inch	10'-0"	1/2"
8 to 10 inch	10'-0"	5/8"
12 to 14 inch	10'-0"	3/4"
15 inch and over	10'-0"	7/8"
(Copper Pipe)		
1/2 to 1-1/4 inch	5'-0"	3/8"
1-1/2 to 2-1/2 inch	8'-0"	3/8"
3 to 4 inch	10'-0"	3/8"
6 to 8 inch	10'-0"	1/2"
(Cast Iron)		
2 to 3 inch	5'-0"	3/8"
4 to 6 inch	10'-0"	1/2"
8 to 10 inch	10'-0"	5/8"
12 to 14 inch	10'-0"	3/4"
15 inch and over	10'-0"	7/8"
(PVC Pipe)		
1-1/2 to 4 inch	4'-0"	3/8"
6 to 8 inch	4'-0"	1/2"
10 and over	4'-0"	5/8"

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow and at the vertical horizontal transition.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

- E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Install hangers with nut at base and above hanger; tighten upper nut to hanger after final installation adjustments.
- J. Portable pipe hanger systems shall be installed per manufactures instructions.
- K. Distances between supports are maximum distance. Supports shall be provided to carry the pipe/equipment load.

3.03 Insulated Piping: Comply with the following installation requirements.

- A. Clamps: Attach galvanized clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.
- B. Saddles: Install galvanized protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.
- C. Shields: Install protective shields MSS Type 40 on cold and chilled water piping that has vapor barrier. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

<u>NPS</u>	<u>LENGTH</u>	<u>THICKNESS</u>
1/4 THROUGH 3-1/2	12	0.048
4	12	0.060
5 & 6	18	0.060
8 THROUGH 14	24	0.075
16 THROUGH 24	24	0.105

- D. Piping 2" and larger provide galvanized sheet metal shields with calcium silicate at hangers/supports.
- E. Insert material shall be at least as long as the protective shield.
- F. Thermal Hanger Shields: Install where indicated, with insulation of same thickness as piping.

3.04 EQUIPMENT BASES AND SUPPORTS

- A. Provide equipment bases of concrete.
- B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.
- C. Construct support of steel members. Brace and fasten with flanges bolted to structure.

- D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.05 FLASHING

- A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Flash vent and soil pipes projecting 8 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter flash and seal.
- C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
- D. Seal floor shower mop sink and all other drains watertight to adjacent materials.
- E. Provide curbs for mechanical roof installations 8 inches minimum high above roofing surface. Contact architect for all flashing details and roof construction. Seal penetrations watertight.

3.06 SLEEVES

- A. Set sleeves in position in formwork. Provide reinforcing around sleeves.
- B. Extend sleeves through floors minimum one inch above finished floor level. Caulk sleeves full depth with fire rated thermfiber and 3M caulking and provide floor plate.
- C. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with U.L. listed fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- D. Fire protection sleeves may be flush with floor of stairways.

END OF SECTION

SECTION 23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

- 1.03 Refer to Architectural Sections for additional requirements.

PART 2 - PRODUCTS

2.01 VALVE AND PIPE IDENTIFICATION

A. Valves:

1. All valves shall be identified with a 1-1/2" diameter brass disc wired onto the handle. The disc shall be stamped with 1/2" high depressed black filled identifying numbers. These numbers shall be numerically sequenced for all valves on the job.
2. The number and description indicating make, size, model number and service of each valve shall be listed in proper operational sequence, properly typewritten. Three copies to be turned over to Owner at completion.
3. Tags shall be fastened with approved meter seal and 4 ply 0.018 smooth copper wire. Tags and fastenings shall be manufactured by the Seton Name Plate Company or approved equal.
4. All valves shall be numbered serially with all valves of any one system and/or trade grouped together.

B. Pipe Marking:

1. All interior visible piping located in accessible spaces such as above accessible ceilings, equipment rooms, attic space, under floor spaces, etc., shall be identified with all temperature pipe markers as manufactured by W.H. Brady Company, 431 West Rock Ave., New Haven, Connecticut, or approved equal.
2. All exterior visible piping shall be identified with UV and acid resistant outdoor grade acrylic plastic markers as manufactured by Set Mark distributed by Seton nameplate company. Factory location 20 Thompson Road, Branford, Connecticut, or approved equal.
3. Generally, markers shall be located on each side of each partition, on each side of each tee, on each side of each valve and/or valve group, on each side of each

piece of equipment, and, for straight runs, at equally spaced intervals not to exceed 75 feet. In congested area, marks shall be placed on each pipe at the points where it enters and leaves the area and at the point of connection of each piece of equipment and automatic control valve. All markers shall have directional arrows.

4. Markers shall be installed after final painting of all piping and equipment and in such a manner that they are visible from the normal maintenance position. Manufacturer's installation instructions shall be closely followed.
5. Markers shall be colored as indicated below per ANSI/OSHA Standards:

<u>SYSTEM</u>	<u>COLOR</u>	<u>LEGEND</u>
Chilled Water	Green	Chilled Water Supply Chilled Water Return
Condenser Water	Green	Condenser Water Supply Condenser Water Return
Compressed Air	Blue	Compressed Air
Pneumatic Control	Yellow	Pneumatic Controls
Oxygen	Yellow	Oxygen
Nitrogen	Green	Nitrogen
Deionized Water	Green	Deionized Water
Steam	Yellow	Steam Supply Steam Return

C. Pipe Painting:

1. All piping exposed to view shall be painted as indicated or as directed by the Architect in the field. Confirm all color selections with Architect prior to installation.
2. The entire fire protection piping system shall be painted red.
3. All piping located in mechanical rooms and exterior piping shall be painted as indicated below:

<u>System</u>	<u>Color</u>
Condenser Water Supply and Return	Light Green
Chilled Water Supply and Return	Light Blue
Heating Hot Water Supply and Return	Reddish Orange

PART 3 - EXECUTION

- 3.01 All labeling equipment shall be installed as per manufacturers printed installation instructions.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Contractors price shall include all items required as per manufacturers'

requirements.

- 3.03 All piping shall be cleaned of rust, dirt, oil and all other contaminants prior to painting. Install primer and a quality latex paint over all surfaces of pipe.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.02 RELATED DOCUMENTS

Approved submittal date on equipment installed, to accomplish the test procedures, outlined under Services of the Contractor of this Section, will be provided by the Contractor.

1.03 DESCRIPTION

- A. The TAB of the air conditioning systems will be performed by an impartial technical firm whose operations are limited only to the field of professional TAB. The TAB work will be done under the direct supervision of a qualified engineer employed by the TAB firm.
- B. The TAB firm will be responsible for inspecting, adjusting, balancing, and logging the data on the performance of fans, dampers in the duct system, and air distribution devices. The Contractor and the various subcontractors of the equipment installed shall cooperate with the TAB firm to furnish necessary data on the design and proper applications of the system components and provide labor and material required to eliminate deficiencies or malperformance.

1.04 QUALITY ASSURANCE

- A. **QUALIFICATIONS OF CONTRACTOR PERSONNEL:** Submit evidence to show that the personnel who shall be in charge of correcting deficiencies for balancing the systems are qualified. The Owner and Engineer reserve the right to require that the originally approved personnel be replaced with other qualified personnel if, in the Owner and Engineer's opinion, the original personnel are not qualified to properly place the system in condition for balancing.
- B. **QUALIFICATIONS OF TAB FIRM PERSONNEL:**
 - 1. A minimum of one registered Professional Engineer licensed in the State, is required to be in permanent employment of the firm.
 - 2. Personnel used on the jobsite shall be either Professional Engineers or technicians, who shall have been permanent, full time employees of the firm for a minimum of six months prior to the start of Work for that specified project.
 - 3. Evidence shall be submitted to show that the personnel who actually balance the systems are qualified. Evidence showing that the personnel have passed the tests required by the Associated Air Balance Council (AABC) shall be required.
- C. **CALIBRATION LIST:** Submit to the Engineer for approval, a list of the gauges, thermometers, velometer, and other balancing devices to be used in balancing the system. Submit evidence to show that the balancing devices are properly calibrated before proceeding with system balancing.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SERVICES OF THE CONTRACTOR

- A. The Drawings and specifications have indicated valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, install these devices in a manner that leaves them accessible, provide access as requested by the TAB firm.
- B. Have systems complete and in operational readiness prior to notifying the TAB firm that the project is ready for their services, and certify in writing to the Construction Manager that such a condition exists.
- C. As a part of the Work of this Section, make changes in the sheaves, belts, and dampers or the addition of dampers required for correct balance of the new work as required by the TAB firm, at no additional cost to the Owner.
- D. Fully examine the existing system to be balanced, to determine whether or not sufficient volume dampers, balancing valves, thermometers, gauges, pressure and temperature taps, means of reading static pressure and total pressure in duct systems, means of determining water flow, and other means of taking data needed for proper water and air balancing are existing. Submit to the Engineer in writing a listing of omitted items considered necessary to balance existing systems. Submit the list and proposal as a cost add item.
- E. Verify that fresh air louvers are free of blockage, coils are clean and fresh air ducts to each air handling unit has individually adjustable volume regulating dampers.
- F. Provide, correct, repair, or replace deficient items or conditions found during the testing, adjusting, and balancing period.
- G. In order that systems may be properly tested, balanced, and adjusted as specified, operate the systems at no expense to the Owner for the length of time necessary to properly verify their completion and readiness for TAB period.
- H. Project Contract completion schedules shall provide time for allowances to permit the successful completion of TAB services to Owner's final inspection and acceptance. Complete, operational readiness, prior to commencement of TAB services, shall include the following services of the Contractor:
 - 1. Construction status of building shall permit the closing of doors, window, ceilings installed and penetrations complete, to obtain project operating conditions.
 - 2. AIR DISTRIBUTION SYSTEMS:
 - a. Verify installation for conformity to design. Supply, return, and exhaust ducts terminated and pressure tested for leakage as specified.
 - b. Volume and fire dampers properly located and functional. Dampers serving requirements of minimum and maximum outside air, return and relief shall provide tight closure and full opening, smooth and free operation.
 - c. Supply, return, exhaust and transfer grilles, registers and diffusers.
 - d. Air handling systems, units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc., shall be blanked and sealed to eliminate excessive bypass or leakage of air.

- e. Fans (supply and exhaust) operating and verified for freedom from vibrations, proper fan rotation and belt tension; overload heater elements shall be of proper size and rating; record motor amperage and voltage and verify that these functions do not exceed nameplate ratings.
 - f. Furnish or revise fan drives or motors as necessary to attain the specified air volumes.
3. WATER CIRCULATING SYSTEMS:
- a. Position valves pertinent to system design and require operation to permit full flow of water through system components. Operate hydronic systems under full flow conditions until circulating water is clean. Remove and clean strainers as required during this cycle of operation.
 - b. Record each existing pump motor amperage and voltage, for retrofit. Readings shall not exceed nameplate rating.
 - c. Verify, on new equipment, electrical starter overload heater elements to be of proper size and rating.
 - d. Ensure that water circulating systems shall be full of water and free of air; expansion tanks set for proper water level, and air vents installed at high points of systems and operating freely. Advise Owner of deficiencies.
 - e. Check and set operating temperatures of heat exchangers to design requirements.
4. AUTOMATIC CONTROLS:
- a. Verify that control components are installed in accordance with project documents and functional, electrical interlocks, damper sequences, air and water resets, fire and freeze stats.
 - b. Controlling instruments shall be functional and set for design operating conditions. Factory precalibration of room thermostats and pneumatic equipment will not be acceptable.
 - c. The temperature regulation shall be adjusted for proper relationship between the controlling instruments and calibrated by the TAB Contractor. Advise Owner of deficiencies or malfunctions.

3.02 SERVICES OF THE TAB FIRM

- A. The TAB firm will act as liaison between the Owner, Engineer, and the Contractor and inspect the installation of mechanical piping system, sheet metal work, temperature controls and other component parts of the heating, air conditioning and ventilating systems being retrofitted, repaired, or added under this Contract. The reinspection of the Work will cover that part related to proper arrangement and adequate provision for the testing and balancing and will be done when the Work is 80 percent complete.
- B. Upon completion of the installation and start-up of the mechanical equipment, to check, adjust, and balance system components to obtain optimum conditions in each conditioned space in the building. Prepare and submit to the Owner complete reports on the balance and operations of the systems.
- C. Measurements and recorded readings of air, water, and electricity that appear in the reports will be done by the permanently employed technicians or engineers of the TAB firm.
- D. Make an inspection in the building during the opposite season from that in which the initial adjustments were made. At the time, make necessary modifications to the initial adjustments required to produce optimum operation of system components to affect the proper conditions as indicated on the Drawings. At time of opposite season check-out, the Owner's representative will be notified before readings or adjustments are made.

- E. In fan systems, the air quantities indicated on the Drawings may be varied as required to secure a maximum temperature variation of two degrees within each separately controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Contractor to furnish or revise fan drive and motors if necessary, without cost to the Owner, to attain the specified air volumes.
- F. The various existing water circulating systems shall be cleaned, filled, purged of air, and put into operation before hydronic balancing.

3.03 PROFESSIONAL REPORT

- A. Before the final acceptance of the report is made, the TAB firm will furnish the Owner the following data to be approved by the Owner and Engineer:
 - 1. Summary of main supply, return and exhaust duct pitot tube traverses and fan settings indicating minimum value required to achieve specified air volumes.
 - 2. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation as developed by the Engineer and TAB firm.
 - 3. Air quantities at each return and exhaust air handling device.
 - 4. Static pressure readings entering and leaving each supply fan, exhaust fan, filter, coil, balancing dampers and other components of the systems included in the retrofit Work. These readings will be related to performance curves in terms of the CFM handled if available.
 - 5. Motor current readings at each equipment motor on load side of capacitors. The voltages at the time of the reading shall be listed.
 - 6. The final report shall certify test methods and instrumentation used, final velocity reading obtained, temperatures, pressure drops, RPM of equipment, amperage of motors, air balancing problems encountered, recommendations and uncompleted punch list items. The test results will be recorded on standard forms.
 - 7. A summary of actual operating conditions shall be included with each system outlining normal and ventilation cycles of operation. the final report will act as a reference of actual operating conditions for the Owner's operating personnel.

3.04 BALANCING AIR CONDITIONING SYSTEM

A. GENERAL:

- 1. Place all equipment into full operation, and shall continue the operating during each working day of balancing and testing. If the air conditioning system is balanced during Off-Peak cooling season Balancing Contractor shall return to rebalance air side system as required to put system in proper balance at that time.
- 2. The Contractor shall submit detailed balancing and recording forms for approval. After the approval by the Architect, prepare complete set of forms for recording test data on each system. All Work shall be done under the supervision of a Registered Professional Engineer. All instruments used shall be accurately calibrated to within 1% of scale and maintained in good working order.
- 3. Upon completion of the balancing and testing, the Balancing Contractor shall compile the test data in report forms, and forward five copies to the Architect for evaluation.
- 4. The final report shall contain logged results of all tests, including such data as:
 - a. Tabulation of air volume at each outlet.
 - b. Outside dry bulb and wet bulb temperature.
 - c. Inside dry bulb and wet bulb temperatures in each conditioned space

- room or area.
 - d. Actual fan capacities and static pressures. Motor current and voltage readings at each fan.
- B. AIR SYSTEMS: Perform the following operations as applicable to system balance and test:
 1. Check fan rotation.
 2. Check filters (balancing shall be done with clean filters).
 3. Test and adjust blower rpm to design requirements.
 4. Test and record motor full load amperes.
 5. Test and record system static pressures, suction and discharge.
 6. Test and adjust system for design cfm, return air and outside air (+2%). Change-out fan sheaves as required to balance system.
 7. Test and record entering air temperatures, db and wb.
 8. Test and record leaving air temperatures, db and wb.
 9. Adjust all zones to design cfm (+2%).
 10. Test and adjust each diffuser, grille, and register to within 5% of design.
- C. AIR DUCT LEAKAGE: (From SMACNA Duct Standards 3rd Edition) Test all ductwork (designed to handle over 1000 CFM) as follows:
 1. Test apparatus

The test apparatus shall consist of:

 - a. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
 - b. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.
 2. Test Procedures
 - a. Test for audible leaks as follows:
 - 1) Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
 - 2) Start the blower with its control damper closed.
 - 3) Gradually open the inlet damper until the duct pressure reaches 1.2 times the standard designed duct operating pressure.
 - 4) Survey all joint for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
 - b. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
 - 1) Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.
 - 2) Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
 - 3) Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
 - 4) Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which, must be corrected.

D. DX SYSTEMS:

1. Test and record suction and discharge pressures at each compressor and record ambient air temperature entering the condensing coils.
2. Test and record unit full load amps and voltage.
3. Test and record staging and unloading of unit required by sequence of operation or drawing schedule.

E. Automatic temperature controls shall be calibrated and all thermostats and dampers, adjusted so that the control system is in proper operating condition, subject to the approval of the Architect.

F. The Air Balance Contractor shall report to Engineer all air distribution devices or other equipment that operate noisily so that corrective measures may be implemented by the Contractor at no additional cost to the Owner or Architect/Engineer.

END OF SECTION

SECTION 23 07 13 - DUCT INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Ductwork system insulation.

1.02 RELATED SECTIONS

- A. Section 23 02 00 - Basic Materials and Methods
- B. Section 23 05 13 – Common Motor Requirements for HVAC Equipment
- C. Section 23 05 53 – Identification for HVAC Piping and Equipment

1.03 QUALITY ASSURANCE

- A. Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.
- B. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.
 - 1. Exception: Outdoor mechanical insulation may have flame spread index of 75 and smoke developed index of 150.
- C. Duct and plenum insulation shall comply with minimum R-value requirements of 2009 International Energy Conservation Code.
- D. Adhesive and other material shall comply with NFPA and NBFU Standards No. 90A and 90B.

1.04 SUBMITTALS

- A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation, coverings, cements, adhesives, and coatings to site in unopened containers with manufacturer's stamp, clearly labeled with flame and smoke rating, affixed showing fire hazard indexes of products.
- B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.01 GENERAL DESCRIPTION

- A. The type of insulation and its installation shall be in strict accordance with these

specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed.

- B. A sample quantity of each type of insulation and each type of application shall be installed and approval secured prior to proceeding with the main body of the work.

2.02 ACCEPTABLE MANUFACTURERS

- A. Glass fiber materials shall be as manufactured by Knauf, Certain-Teed, Johns-Manville or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.
- B. Adhesives shall be as manufactured by Minnesota Mining, Arabol, Benjamin-Foster, Armstrong or Insulmastic, Inc., and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.
- C. Ceramic fiber materials shall be as manufactured by Primer Refractories, A.P. Green Refractories or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

- A. All insulation shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.
- B. All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

3.02 EXTERNAL DUCT INSULATION

- A. Fasten all longitudinal and circumferential laps with outward clinching staples 3" on center. On rectangular ducts over 24" wide apply as above and hold insulation in place on bottom side with mechanical pins and clips on 12" centers.
- B. Seal all joints, fastener penetrations and other breaks in vapor barrier with 3 inch wide strips of white glass fabric embedded between two coats of vapor barrier mastic, Childers CP-30 or approved equal.
- C. All external duct insulation shall be Johns Manville Type 75 fiberglass duct wrap insulation with reinforced aluminum facing or approved equal.
- D. External duct wrap is required on all outside air ducts and supply air ducts that are not internally insulated. Duct wrap shall be provided as follows:
 - 1. 1½" thick, 1.0 PCF density minimum when ducts are located in conditioned spaces.
 - 2. 2" thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.

3.03 DUCT LINER

- A. Duct liner shall be kept clean and dry during transportation, storage and installation. Care should be taken to protect the liner from exposure to the elements or damage from

mechanical abuse.

- B. All portions of duct designed to receive duct liner shall be completely covered with liner as specified. The smooth, black, acrylic-coated surfaces with flexible glass cloth reinforcement shall face the airstream. All duct liner shall be cut to assure tight, overlapped corner joints. The top pieces shall be supported by the sidepieces. Duct liner shall be installed following the guidelines in the NAIMA "Duct Liner Installation Standard".
- C. The duct liner shall be tested according to erosion test method in UL 181 and shall be guaranteed to withstand velocities in the duct system up to 5000 fpm without surface erosion.
- D. Duct liner shall be adhered to the sheet metal with full coverage of an approved adhesive that conforms to ASTM C 916, and all exposed leading edges and transverse joints shall be coated with Permacote factory-applied or field-applied edge coating and shall be neatly butted without gaps. Shop or field cuts shall be liberally coated with Johns Manville SuperSeal® duct butter and Edge Treatment or approved adhesive.
- E. Metal nosings shall be securely installed over transversely oriented liner edges facing the airstream at forward discharge and at any point where lined duct is preceded by unlined duct.
- F. When velocity exceeds 4000 fpm (20.3 m/sec), use metal nosing on every leading edge. Nosing may be formed on duct or be channel or zee attached by screws, rivets or welds.
- G. The liner shall further be secured with Graham welding pins and washers on not more than 18 inch centers both vertical and horizontal surfaces, and the pins and washers shall be pointed up with adhesive.
- H. Duct liner shall be Johns Manville Linacoustic RC fiberglass duct liner with factory-applied edge coating or approved equal. The liner shall meet the Life Safety Standards as established by NFPA 90A and 90B, FHC 25/50 and Limited Combustibility and the air stream surface coating should contain an immobilized, EPA-registered, anti microbial agent so it will not support microbial growth as tested in accordance with ASTM G21 and G22. The duct liner shall conform to the requirements of ASTM C 1071, with an NRC not less than .70 as tested per ASTM C 423 using a Type "A" mounting, and a thermal conductivity no higher than .25 BTU•in/(hr•ft²•°F) at 75°F mean temperature.
- I. Duct liner is required on all return air ductwork, return air boots and supply air ductwork downstream of the terminal units. Duct liner shall be provided as follows:
 - 1. 1" Thick, 1.5 PCF density minimum when ducts are located in conditioned spaces.
 - 2. 1 ½" Thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.
 - 3. 2" Thick with a minimum installed R-value of 8 when ducts are located outdoors.
- J. Line supply and return ductwork at connection of HVAC unit to a point of 15 feet upstream and downstream of the equipment with Johns Manville, Linacoustic RC with an R-value of 5 or approved equal for thermal insulation and noise control. The liner shall meet the safety standards as indicated above with NRC not less than 0.75 as tested per ASTM C423 using a type "A" mounting and thermal conductivity no higher than 0.24 BTU•in/(hr•ft²•°F) at 75°F mean temperature. Attach with full cover coat of cement, duct dimensions up to 16 inches, provide stick clips or screws and cap for dimension over 16 inches, space 16 inches o.c. maximum. Provide sheet metal liner cap over all leading edges of internal insulation exposed to air stream.

3.04 EXPOSED DUCTWORK LOCATED INDOORS

- A. Duct routed exposed shall be internally lined as specified.

3.05 EXPOSED DUCT LOCATED OUTDOORS

- A. All duct located outdoors shall be internally lined as specified and also shall have a 2" thick, 6 lb. density rigid board external duct insulation, finished with a white weatherproofed canvas material.
- B. Paint non-insulated duct. Coordinate color with Architect.

3.06 AIR DEVICE AND MISCELLANEOUS DUCT INSULATION

- A. The backside of all supply air devices shall be insulated with taped and sealed 1½ inch thick external duct wrap.
- B. The contractor shall install an additional layer of 1½ inch thick external fiberglass duct wrap on any portion of the supply air, return air, outside air, or exhaust air system that has condensation forming during any period of operation. The insulation shall be taped and sealed and located until all evidence of the condensation had been eliminated at no additional cost to the owner.

3.07 KITCHEN GREASE HOOD EXHAUST DUCT

- A. All kitchen range hood exhaust duct shall be enclosed with 2 hours fire rated enclosure.
- B. The duct enclosure shall be sealed around the duct at the points of penetration.
- C. The enclosure shall be separated from the duct by at least 3 inches and not more than 12 inches.
- D. Cleanout openings at exhaust duct with access openings at the fire rated enclosure and access doors shall be provided at each duct offset and as required for proper operation and maintenance.
- E. As an alternate method, the contractor may use the "3M FireMaster Fastwrap" along with "3M Fire Barrier 1000 N/S Silicone Sealant", Johns Manville firetemp Wrap SL2 or approved equals in lieu of the fire rated enclosure, providing the product used shall meet UL requirements and be approved by the local authority have jurisdiction. This application shall follow the manufacturers' strict installation instructions and guidelines.
- F. Insulation and all other requirements shall be provided per local codes.

END OF SECTION

SECTION 23 07 19 – HVAC PIPING INSULATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

- A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.
- B. Furnish and install piping insulation to:
 - 1. Chilled water and heating hot water piping.
 - 2. Condensate drainage piping.
 - 3. Refrigerant piping.
 - 4. All pipes subject to freezing conditions shall be insulated.
- C. Work specified elsewhere.
 - 1. Painting.
 - 2. Pipe hangers and supports.
- D. For insulation purpose piping is defined as the complete piping system including supplies and returns, pipes, valves, automatic control valve bodies, fittings, flanges, strainers, thermometer well, unions, reducing stations, and orifice assemblies.

1.03 WARRANTY

- A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship.
- B. Defects shall include, but not be limited to, the following:
 - 1. Mildewing.
 - 2. Peeling, cracking, and blistering.
 - 3. Condensation on exterior surfaces.

1.04 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. **PRODUCT DATA:** Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, project variations, and accessories.

1.05 DELIVERY AND STORAGE

- A. DELIVERY: Deliver undamaged materials in the manufacturer's unopened containers. Containers shall be clearly labeled with the insulation's flame and smoke ratings.

PART 2 - PRODUCTS

- 2.01 It is the intent of these specifications to secure superior quality workmanship resulting in an absolutely satisfactory installation of insulation from the standpoint of both function and appearance. Particular attention shall be given to valves, fittings, pumps, etc., requiring low temperature insulation to insure full thickness of insulation and proper application of the vapor seal. All flaps of vapor barrier jackets and/or canvas covering must be neatly and securely smoothed and sealed down.
- 2.02 The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved prior to installation.
- 2.03 A sample quantity of each type of insulation and each type application shall be installed and approval secured prior to proceeding with the main body of the work. Condensation caused by improper installation of insulation shall be corrected by Installing Contractor. Any damage caused by condensation shall be made good at no cost to the Owner or Architect/Engineer.
- 2.04 All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to insulation) fire and smoke hazard as tested by Procedure ASTM E084, NFPA 255 and UL 723 not exceeding:

Flame Spread 25
Smoke Developed 50

- 2.05 Accessories, such as adhesives, mastics and cements shall have the same component ratings as listed above.
- 2.06 All products or their shipping cartons shall have a label affixed, indicating flame and smoke ratings do not exceed the above requirements.
- 2.07 APPROVED MANUFACTURERS
 - A. Calcium silicate materials shall be as manufactured by Johns Manville.
 - B. Glass fiber materials shall be as manufactured by Johns Manville or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.
 - C. Adhesives shall be as manufactured by Childers, Foster, HB Fuller or Armstrong, and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.
 - D. Armaflex elastomeric cellular thermal insulation by Armstrong.
 - E. Phenolic foam insulation shall be as manufactured by Kooltherm Insulation (Koolphen).
 - F. Metal jacketing and fitting covers shall be as manufactured by Childers or RPR Products.

2.08 MATERIALS

- A. CHILLED WATER AND HEATING HOT WATER PIPE: Provide fiberglass pipe insulation with ASJ-SSL jacket or phenolic foam with ASJ and all joints sealed.

- B. CONDENSATE DRAINAGE PIPING: Fire resistant fiberglass insulation; insulation not required when piping is exposed on roof.
- C. REFRIGERANT PIPING: Refrigerant pipe insulation shall be model "AP-2000", fire rated for use in environmental air plenums. Apply manufacturers recommended finish and sealant for exterior applications.
- D. METAL JACKETING: Utilize Childers "Strap-On" jacketing. Provide preformed fitting covers for all elbows and tees.

PART 3 - EXECUTION

- 3.01 All insulation shall be installed in accordance with the manufacturers' recommendations and printed installation instructions, including high density inserts at all hangers and pipe supports to prevent compression of insulation.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.
- 3.03 Pipes located outdoors or in tunnels shall be insulated same as concealed piping; and in addition shall have a jacket of 0.016 inch thick, smooth aluminum with longitudinal modified Pittsburg Z-Lock seam and 2 inch overlap. Jacketing shall be easily removed and replaced without damage. All butt joints shall be sealed with gray silicone. Galvanized banding is not acceptable.
- 3.04 All insulated piping located over driveways shall have an aluminum shield permanently banded over insulation to protect it from damage from car antennas.
- 3.05 WATER PIPE INSULATION INSTALLATION
 - A. The insulation shall be applied to clean, dry pipes with all joints firmly butted together. Where piping is interrupted by fittings, flanges, valves or hangers and at intervals not to exceed 25 feet on straight runs, an isolating seal shall be formed between the vapor barrier jacket and the bare pipe. The seal shall be by the applications of adhesive to the exposed insulation joint faces, carried continuously down to and along 4 inches of pipe and up to and along 2 inches of jacket.
 - B. Pipe fittings and valves shall be insulated with pre-molded or shop fabricated glass fiber covers finished with two brush coats of vapor barrier mastic reinforced with glass fabric.
 - C. All under lap surfaces shall be clean and free of dust, etc. before the SSL is sealed. These laps shall be firmly rubbed to insure a positive seal. A brush coat of vapor retarder shall be applied to all edges of the vapor barrier jacket.
- 3.06 STANDBY-GENERATOR ENGINE EXHAUST PIPING
 - A. Entire engine exhaust pipe from exhaust manifold to outside terminal shall be enclosed in a 1" thick layer of calcium silicate insulation shall cover the first layer.
 - B. A second insulating layer of 1" thick calcium silicate shall cover the first layer.
 - C. Joints for the first and second layer shall be staggered.
 - D. Apply aluminum jacket over outer layer of insulation.
 - E. Insulate exhaust muffler in the same manner as the exhaust piping.

3.07 FIRE RATED INSULATION

- A. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe.
- B. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty.
- C. All fire rating material shall be insulated in accordance with manufacturer's printed instructions.

PART 4 - SCHEDULES

4.01 LOW TEMPERATURE SURFACES

MINIMUM INSULATION THICKNESS
BASED ON FIBERGLASS

- A. Condensate drain lines: ¾ inch
- B. Chilled Water Piping:
 - (1) Located outdoors: 2 inch
 - (2) Located indoors:
 - (a) 4 inch and smaller: 1½ inch
 - (b) Larger than 4 inch: 2 inch
- C. Refrigerant Piping
 - (1) 1½" and smaller: 1 inch
 - (2) Larger than 1½ inch: 1½ inch

4.02 HIGH TEMPERATURE SURFACES

MINIMUM INSULATION
THICKNESS

- A. Hot Water Piping:
 - (1) Operating temperature 105°F or less: 1 inch
 - (2) Operating temperature higher than 105°F and pipe size 1½ inch or smaller: 1 inch
 - (3) Operating temperature higher than 105°F and pipe size more than 1½ inch: 2 inch
- B. Steam Piping:
 - (1) Pipe size 1½ inch and smaller: 1½ inch
 - (2) Pipe size more than 1½ inch: 3 inch

END OF SECTION

SECTION 23 23 00 - REFRIGERANT PIPING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

PART 2 - PRODUCTS

2.01 GENERAL

Provide for the systems as shown. Submit shop drawings of piping systems showing all traps, pipe sizes, and accessories; drawing to be marked "Approved", and signed by a representative of the Application Engineering Department of the condensing unit manufacturer. Pipe sizes shall be as recommended by unit manufacturer. Refer to piping schematic on drawings.

2.02 MATERIAL

- A. PIPE: Copper ACR tubing.
- B. FITTINGS: Wrought copper streamlined sweat fitting.
- C. SOLDER: Sil-Fos, except on valves use solder recommended by valve manufacturer.

2.03 ACCESSORIES

All accessories shall be UL listed and rated in accordance with ARI Standard 710.

- A. On systems 7-1/2 tons and larger, each separate refrigerant circuit shall have a separate filter dryer. Each filter dryer shall have a replaceable core and a three valve bypass. The filter drier shall be full line size and installed in the refrigerant liquid line. The filter shall have a minimum 4-3/4 inches diameter shell with removable flange and gasket. Flange shall be tapped for 1/4 inch FPT access valve. Size filter-drier for maximum 2.0 psi pressure drop at evaporator operating temperature. Similar to Mueller Brass Company model Drymaster micro-guard refillable filter series SD-485 through SD19217 or Sporlan catch-all.
- B. On systems less than 7-1/2 tons, the filter dryer shall be the sealed type sizes as above. One drier per refrigerant circuit.
- C. Liquid-Moisture Indicator shall be installed in liquid refrigerant line full line size similar to Mueller Brass Company model "Vuemaster" with soldered ends.
- D. Thermostatic expansion valve shall have adjustable super heat and be as manufactured by Sporlan.

2.04 EVACUATION

Evacuate moisture completely by applying a commercial vacuum pump for a minimum of 24 hours. Moisture indicator shall indicate a completely moisture-free condition at time of final inspection. The vacuum pump shall run until the system indicates a maximum of 35 degrees FDB. The system shall be flushed with the operating refrigerant and the vacuum pump connected and rerun to repeat the evacuation. Evaluation shall be performed under supervision of the Engineer.

2.05 REFRIGERANT AND OIL

- A. Contractor shall leave the refrigeration system with a full charge of refrigerant and oil and shall be responsible for the maintenance of a full charge of refrigerant and oil in the systems for a period of one year from date of acceptance.
- B. Should any leaks in the refrigeration system occur during the guarantee period, the Contractor shall eliminate such leaks and recharge system to a full charge of refrigerant and oil at no cost to the Owner.

PART 3 - EXECUTION

- 3.01 All equipment and piping shall be installed in accordance with the manufacturers recommendations and printed installation instructions.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

END OF SECTION

SECTION 23 37 13 - AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Ceiling air diffusers.
- B. Wall registers and grilles.
- C. Louvers.
- D. Other air devices indicated on drawings and schedules.

1.02 RELATED SECTIONS

- A. Section 23 02 00 – Basic Materials and Methods
- B. Section 23 05 93 – Testing, Adjusting and Balancing
- C. Section 23 31 13 – Metal Ductwork
- D. Section 23 31 16 – Fibrous Glass Ductwork
- E. Section 23 31 19 – Ductwork Accessories

1.03 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of air distribution devices of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards:
 - 1. ARI Compliance: Test and rate air distribution devices in accordance with ARI 650 "Standard for Air Outlets and Inlets".
 - 2. ASHRAE Compliance: Test and rate air distribution devices in accordance with ASHRAE 70 "Method of Testing for Rating the Air Flow Performance of Outlets and Inlets".
 - 3. AMCA Compliance: Test and rate louvers in accordance with AMCA 500 "Test Method for Louvers, Dampers and Shutters".
 - 4. AMCA Seal: Provide louvers bearing AMCA Certified Rating Seal.
 - 5. NFPA Compliance: Install air distribution devices in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data for air distribution devices including the following:
 - 1. Schedule of air distribution devices indicating drawing designation, room location, number furnished, model number, size, and accessories furnished.
 - 2. Data sheet for each type of air distribution devices, and accessory furnished; indicating construction, finish, and mounting details.

3. Performance data for each type of air distribution devices furnished, including aspiration ability, temperature and velocity traverses; throw and drop; and noise criteria ratings. Indicate selections on data.
- B. Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air distribution devices, indicating materials and methods of assembly of components.
- C. Maintenance Data: Submit maintenance data, including cleaning instructions for finishes, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals; in accordance with requirements of Division 1.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver air distribution devices wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.
- B. Store air distribution devices in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

1.06 WARRANTY

- A. Warrant the installation of the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from defective or nonconforming workmanship.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Titus Company
- B. Metalaire Industries, Inc.
- C. Nailor Industries
- D. Krueger
- E. Price
- F. Substitutions under provisions of Division One.

2.02 GENERAL DESCRIPTION

- A. Unless otherwise indicated, provide manufacturer's standard air devices when shown of size, shape, capacity, type and accessories indicated on drawings and schedules, constructed of materials and components as indicated and as required for complete installation and proper air distribution.
- B. Provide air devices that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device and listed in manufacturer's current data.
- C. Unless noted otherwise on drawings, the finish shall be #26 white. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100 hour ASTM D117 Corrosive Environments Salt Spray Test without

creepage, blistering, or deterioration of film. The paint must pass a 250 hour ASTM-870 Water Immersion Test. The paint must also pass the ASTM D-2794 Reverse Impact Cracking Test with a 50 inch pound force applied.

- D. Provide air device with border styles that are compatible with adjacent ceiling or wall system, and that are specially manufactured to fit into the wall construction or ceiling module with accurate fit and adequate support. Refer to architectural construction drawings and specifications for types of wall construction and ceiling systems.
- E. Provide integral volume damper with roll formed steel blades where indicated on drawings or schedules. Dampers shall be opposed blade design with a screw driver slot or a concealed lever operator for adjustment through the face of the air device.
- F. Air devices designated for fire rated systems shall be pre-assembled with UL classified radiation damper and thermal blanket. Fire rated air devices shall be shipped completely assembled; one assembly per carton, Each assembly shall be enclosed in plastic shrink wrap with installation instructions.

2.03 LOUVERS

- A. Except as otherwise indicated, provide manufacturer's standard louvers where shown; of size, shape, capacity and type indicated; constructed of materials and components as indicated, and as required for complete installation.
- B. Provide louvers that have minimum free area, and maximum pressure drop of each type as listed in manufacturer's current data, complying with louver schedule.
- C. Provide louvers with frame and sill styles that are compatible with adjacent substrate, and that are specifically manufactured to fit into construction openings with accurate fit and adequate support, for weatherproof installation. Refer to architectural construction drawings and specifications for types of substrate.
- D. Louvers shall be constructed of aluminum extrusions, ASTM B 221, Alloy 6063-T5. Weld units or use stainless steel fasteners.
- E. Louver Screens: On inside face of exterior louvers, provide 1/2" square mesh anodized aluminum wire bird screens mounted in removable extruded aluminum frames.
- F. Acceptable Manufacturers:
 - 1. Ruskin Manufacturing Company
 - 2. Greenheck Company
 - 3. Louvers and Dampers, Inc.
 - 4. Pottorff
 - 5. Arrow
 - 6. Substitutions under provisions of Division One.

PART 3 – EXECUTION

- 3.01 All interior surfaces of all air devices shall be painted flat black.
- 3.02 See floor plans for type, neck size and CFM of air for all air distribution devices.
- 3.03 Install all air distribution devices as detailed on plans and in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 23 41 00 - AIR FILTERS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

PART 2 - PRODUCTS

2.01 FILTERS

- A. The filters shall be FARR 30/30 2 inch thick or approved equal.
- B. **APPROVED MANUFACTURERS:** The following manufacturers are approved subject to specification compliance.
 - 1. American Air Filter.
 - 2. Airguard Industries, Inc.
 - 3. Cambridge.
 - 4. Filtration Group

2.02 LOW VELOCITY FILTER SECTION

- A. Filters shall be of the throwaway cartridge type in 24 inches X 24 inches X 2 inch frames. When installing multiple filters into slide-in frames tape adjacent filters together with duct tape to prevent bypassing of air around the filter. Media shall be rated at 500 feet per minute.
- B. Filtering media shall be formed of non-woven reinforced cotton fabric type filtering media bonded to 96% open area media support grid folded into a non-creased radial pleat design. The filter pack shall be bonded to the inclosing frame to prevent air bypass. Average efficiency shall be 25-30% on ASHRAE test standard 52-76. Initial resistance shall not exceed 0.20 inches water gauge at 350 FPM face velocity.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install differential pressure switch to activate "Filter Dirty" light when pressure difference across filters reaches 0.5 inch W.G. (adjustable). Locate "filter dirty" lights in mechanical rooms with identifying label
- B. Install and relocate filters in the mechanical or the storage room in accordance with manufacturer's recommendations.
- C. Refer to Section 23 02 00 for additional filter information.

END OF SECTION

SECTION 26 02 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.
- C. The approximate locations of Electrical items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.
- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.
- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.
- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent

of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".

- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.
- I. Contractor shall participate in the commissioning process; including but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 RELATED SECTIONS

- A. General Conditions
- B. Supplementary Conditions
- C. Division One

1.04 COOPERATION WITH TRADES:

- A. Cooperation with trades of adjacent, related, or affected materials or operations shall be considered a part of this work in order to affect timely and accurate placing of work and bring together in proper and correct sequence, the work of such trades.

1.05 REFERENCES

- A. National Electrical Code (NEC)
- B. American Society for Testing and Materials (ASTM)
- C. Underwriter's Laboratories, Inc. (UL)
- D. Insulated Cable Engineer's Association (ICEA).
- E. National Electrical Manufacturer's Association (NEMA).
- F. Institute of Electrical and Electronic's Engineers (IEEE).
- G. American National Standards Institute (ANSI).
- H. National Fire Protection Association (NFPA).
- I. International Energy Conservation Code (IECC).

1.06 COMPLETE FUNCTIONING OF WORK:

- A. All work fairly implied as essential to the complete functioning of the electrical systems shown on the Drawings and Specifications shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specifications to establish the types of the systems, but not set forth each item essential to the functioning of the system. In case of doubt as to the work intended, or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for supplementary instructions, Drawings, etc.

- B. Contractor shall review all pertinent Drawings and adjust his work to all conditions shown there on. Discrepancies between Plans, Specifications, and actual field conditions shall be brought to the prompt attention of the Architect.
 - 1. Approximate location of transformers, feeders, branch circuits, outlets, lighting and power panels, outlets for special systems, etc., are indicated on the Drawings. However, the Drawings, do not give complete and accurate detailed locations of such outlets, conduit runs, etc., and exact locations must be determined by actual field measurement. Such locations will, at all times, be subject to the approval of the Architect.
 - 2. Communicate with the Architect and secure his approval of any outlet (light fixture, receptacle, switch, etc.) location about which there may be the least question. Outlets obviously placed in a location not suitable to the finished room or without specific approval, shall be removed and relocated when so directed by the Architect. Location of light fixtures shall be coordinated with reflected ceiling plans.
- C. Additional coordination with mechanical contractor may be required to allow adequate clearances of mechanical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.07 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.

1.08 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their Owners satisfactorily for not less than 3 years.
 - 3. Perform work by persons qualified to produce workmanship of specified quality. Persons performing electrical work shall be required to be licensed. Onsite supervision, journeyman shall have minimum of journeyman license. Helpers, apprentices shall have minimum of apprentice license.

1.09 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.10 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings

which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.

- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.
- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.
- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.
- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.
- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or

provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.
- C. Damaged equipment shall be promptly removed from the site and new, undamaged equipment shall be installed in its place promptly with no additional charge to the Owner.

1.12 SUBMITTALS

- A. Coordinate with Division 1 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or vellum in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:
 - 1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The

cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.

2. An index page with a listing of all data included in the Submittal.
 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
 4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
 6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "**REVISE AND RESUBMIT**".
- B. Refer to Division 1 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.
- D. Where shop drawings and submittals are marked "**REVIEWED**", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. **REVIEWED:** Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
 2. **REVIEWED AS NOTED:** Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.

3. **NOT APPROVED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
 4. **REVISE AND RESUBMIT:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
 5. **CONTRACTOR'S CERTIFICATION REQUIRED:** Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. **MANUFACTURER NOT AS SPECIFIED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.
- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Furnish detailed shop drawings, descriptive literature, physical data and a specification critique for each section indicating "compliance" and/or "variations" for the following items:
- Distribution Panelboards
 - Lighting and Appliance Panelboards
 - Heavy Duty Disconnect Switches
 - Lighting Fixtures
 - Lighting Contactors
 - Time Clocks
 - Lighting Control System
 - Photocells
 - Wiring Devices and Plates
 - Conduit and Fittings
 - Wire
 - Switchboards
 - Harmonic Mitigating Type Transformers
 - Fire Alarm System
 - Surge Protection Device (SPD)
- I. Refer to each specification section for additional requirements.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:
1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
 - a. Wall and type locations.
 - b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.
 - d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm and sanitary sewer piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.
 - j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.
 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

- C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DRAWINGS

1. Maintain a continuous record during the course of construction of all changes and deviations in the work from the contract drawings. Upon completion of the work, purchase a set of "Auto Positive Tracings" on vellum and make corrections as required to reflect the electrical systems as installed. Location and size of all conduit shall be accurately shown to dimension. Submit three prints of the tracings for approval. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. Record drawings shall be furnished in addition to shop drawings. Symbols on the Record drawings shall correspond to the identification symbols on the contract drawings and equipment identification plates and tags.
2. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
3. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.
4. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.
5. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
6. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.
- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.
- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 26.

1.17 MAINTENANCE MANUALS

- A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in "D ring type" binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼" of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Electrical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 26 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 26, include the following information for equipment items:
 - 1. Identifying names, name tags designations and locations for all equipment.
 - 2. Fault Current calculations and Coordination Study.
 - 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 - 4. Fabrication drawings.
 - 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 - 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.

7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 8. Equipment name plate data.
 9. Wiring diagrams.
 10. Exploded parts views and parts lists for all equipment and devices.
 11. Color coding charts for all painted equipment and conduit.
 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.
- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.18 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 26 Sections for additional Operator Training requirements.

1.19 SITE VISITATION

- A. Visit the site of the proposed construction in order to fully understand the facilities, difficulties and restriction attending the execution of the work.
- B. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.
- C. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- D. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.20 WARRANTY

- A. The undertaking of the work described in this Division shall be considered equivalent to the issuance, as part of this work, of a specific guarantee extending one year beyond the

date of completion of work and acceptance by Owner, against defects in materials and workmanship. Materials, appliances and labor necessary to effect repairs and replacement so as to maintain said work in good functioning order shall be provided as required. Replacements necessitated by normal wear in use or by Owner's abuse are not included under this guarantee.

- B. All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service call required to diagnose warranty problems.

1.21 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.
- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.
- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

- F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the

"CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per "CD".

The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

- G. This Five Hundred Dollars (\$500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per "CD" cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. The names and manufacturers and model numbers have been used in the Contract documents to establish types of equipment and standards of quality. Where more than one manufacturer is named for a specific item of equipment, only one of the specified manufacturers will be considered for approval. Where only one manufacturer is mentioned with the phrase "or approved equal", Contractor may submit an alternate manufacturer for consideration, provided the following conditions are met:
1. Submit alternate equipment with complete descriptive data in shop drawing form. Provide sample of equipment upon request for review by Architect. Samples will be returned if requested in writing.
 2. Alternate equipment must be equal from the standpoint of materials, construction and performance.
 3. Alternate submittal must be presented to the Engineer/Architect ten (10) days prior to bid date for approval.
- B. The Architect and Engineer shall be the sole judge of quality and equivalence of equipment, materials and methods.

2.02 All materials and products used on this project shall be listed by Underwriters' Laboratories.

2.03 ACCESS DOORS

- A. Wherever access is required in walls or ceilings to concealed junction boxes, pull boxes, equipment, etc., installed under this Division, furnish a hinged access door and frame with flush latch handle to another Division for installation. Doors shall be as follows:
1. Plaster Surfaces: Milcor Style K.
 2. Ceramic Tile Surfaces: Milcor Style M.
 3. Drywall Surfaces: Milcor Style DW.
 4. Install panels only in locations approved by the Architect.

2.04 EQUIPMENT PADS

- A. Unless noted otherwise 4" high concrete pads for floor mounted equipment shall be installed under Division 3. Pads shall conform to the shape of the equipment with a minimum of 3" margin at equipment supports. Top and sides of pads shall be troweled to a smooth finish, equal to floor. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise.

2.05 ESCUTCHEONS

- A. Provide heavy chrome or nickel plated plates, of approved pattern, on conduit passing through walls, floors and ceilings in finished areas. Where conduit passes through a sleeve, no point of the conduit shall touch the building construction. Caulk around such conduit with sufficient layers of two hour rated firesafing by Thermafiber 4.0 P.C.F. density, U.S.G. fire test 4/11/78 and seal off openings between conduit and sleeves with non-hardening mastic prior to application of escutcheon plate. Escutcheons shall be Gravler Sure-Lock, or approved equal.

2.06 SPACE LIMITATIONS

- A. Equipment shall be chosen which shall properly fit into the physical space provided and shown on the drawings, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall be allowed for clearances in accordance with Code requirements. Physical dimensions and arrangement of equipment shall be subject to the approval of the Architect.

2.07 PAINTING

- A. All factory assembled equipment for electrical work, except light fixtures, that normally is delivered with a factory applied finish shall be delivered with a hard surface factory applied finish such as baked-on machinery enamel which will not require additional field painting. The finish shall consist of not less than 2 coats of medium gray color paint USA No. 61 Munsell Notation 8-3G, 6. 10/0.54 enamel. This Contractor shall protect this finish from damage due to construction operations until acceptance of the building. He shall be responsible for satisfactorily restoring any such finishes or replacing equipment that becomes stained or damaged.

2.08 ELECTRICAL SYSTEM IDENTIFICATION

- A. Conduit Systems: Provide adequate marking of major conduit which is exposed or concealed in accessible spaces to distinguish each run as either a power or signal/communication conduit. Except as otherwise indicated, use orange banding with black lettering. Provide self-adhesive or snap-on type plastic markers. Indicate voltage for that raceway. Locate markers at ends of conduit runs, on pull boxes, on junction boxes, near switches and other control devices, near items of equipment served by the conductors, at points where conduit passes through walls or floors, or enters non-accessible construction and at spacings of not more than 50 feet along each run of conduit. Switch-leg conduit and short branches for power connections do not have to be marked, except where conduit is larger than $\frac{3}{4}$ inch. Branch circuit conduits, junction boxes and pull boxes shall be marked with a permanent marker indicating panel name and branch circuit numbers.
- B. Underground Cable Identification: Bury a continuous, preprinted, bright colored plastic ribbon cable marker with each underground cable (or group of cables), regardless of whether conductors are in conduit, duct bank, or direct buried. Locate each directly over cables, 6 to 8 inches below finished grade.
- C. Identification of Equipment:
 - 1. All major equipment shall have a manufacturer's label identifying the manufacturer's address, equipment model and serial numbers, equipment size, and other pertinent data. Care shall be taken not to obliterate this nameplate in any way.

2. A black-white-black laminated plastic engraved identifying nameplate shall be secured by stainless steel screws to each automatic transfer switch, switchboard, distribution panel, motor control center, motor starter panels and panelboards.
 - a. Identifying nameplates shall have ¼ inch high engraved letters and shall contain the following information:
 - 1) Name
 - 2) Voltage
 - 3) Phase
 - 4) "3" or "4" wire, and
 - 5) Where it is fed from.
 - b. An example of a panelboard nameplate is:
Center Panel – 1HB
480/277 volt, 3 phase, 4 wire
Center Fed from DP2
 - c. An example of an automatic transfer switch nameplate is:
Center ATS #2
480/277 volt, 3 phase, 4 wire, 4 pole
Center Fed from MSB and DPE
3. Each feeder device in a switchboard, distribution panel, and motor control center device shall have a nameplate showing the load served in ½ inch high engraved letters.
4. A black-white-black laminated plastic engraved identifying nameplate shall be secured by screws to each safety switch, disconnect switch, individual motor starter, enclosed circuit breaker, wireway, and terminal cabinet.
 - a. Identifying nameplates shall have ¼ inch high engraved letters and shall indicate the equipment served.
 - b. An example if a disconnect switch is: AHU-1.
5. Cardholders and directory cards shall be furnished for circuit identification in panelboards. Cardholder shall be located on inside of panel door and shall be in a metal frame with clear plastic front. Circuit lists shall be typewritten. Circuit descriptions shall include location and name of each item of equipment served. Spares and spaces shall be written in erasable pencil for future use. Circuit directory shall show the room served by each circuit. The final graphs/signage room numbers shall be used. Do not use Architectural numbering on plans.
6. Prohibited Markings: Markings which are intended to identify the manufacturer, vendor, or other source from which the material has been obtained are prohibited for installation within public, tenant, or common areas within the project. Also, prohibited are materials or devices which bear evidence that markings or insignias have been removed. Certification, testing (example, Underwriters' Laboratories, Inc.), and approval labels are exceptions to this requirement.
7. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.
8. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical system, provide tags of plasticized card stock, either preprinted or hand printed. Tags shall convey the message, example: "DO NOT OPEN THIS SWITCH WHEN BURNER IS OPERATING."

PART 3 - EXECUTION

3.01 EXCAVATING AND BACKFILLING

- A. Trenching and backfilling and other earthwork operations required to install the facilities specified herein shall conform to the applicable requirements of Division 2 (95% of

maximum standard density). Where trenching or excavation is required in improved areas, the backfill shall be compacted to a condition equal to that of adjacent undisturbed earth and the surface of the area restored to the condition existing prior to trenching or excavating operations. Provide a minimum of 3" of sand underneath all conduits. The plans indicate information pertaining to surface and sub-surface obstructions; however, this information is not guaranteed. Should obstructions be encountered whether or not shown, the Contractor shall alter routing of new work, reroute existing lines, remove obstructions where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of new work and leave existing surfaces and structures in a satisfactory and serviceable condition. **All work shall comply with OSHA Standards.**

3.02 WORKMANSHIP AND CONCEALMENT

A. The work of this Section shall be performed by workman skilled in their trade. Installation shall be consistent in completeness whether concealed or exposed. Each item of electrical work shall be concealed in walls, chases, under floors and above ceilings except:

1. Where shown to be exposed.
2. Where exposure is necessary to the proper function.

3.03 SLEEVES, CUTTING AND PATCHING

A. This section shall be responsible for placing sleeves for all conduit passing through walls, partitions, sound walls, beams, floors, roof, etc. Sleeves through below-grade walls shall use water-tight fitting manufactured by O.Z. Gedey.

B. All cutting and patching will be done under another Division, but this Section will be responsible for timely performance of this work and layout of holes and setting sleeves.

C. All un-used sleeves shall be sealed with 2 hour UL approved fire sealant manufactured by "3M" or approved equal.

D. Refer to 26 05 33 for additional requirements.

3.04 ELECTRICAL GEAR

A. Install all electrical equipment in accordance with the National Electrical Code and as shown on the drawings.

B. Lighting contractors, time clocks, disconnect switches, etc. mounted in mechanical/electrical rooms shall be mounted at a working height not requiring a ladder, when wall space is available. Installation of these devices at greater elevations shall be approved by the Engineer. Contractor shall provide a coordination sketch of each mechanical/electrical room noting locations and mounting heights of all electrical devices (note bottom and top elevations) shown to be installed. Sketches shall be provided to the Engineer for review and the general contractor for coordination with other trades working in these rooms.

3.05 CLEANING

A. Clean lighting fixtures and equipment.

B. Touch-up and refinish scratches and marred surfaces on panels, switches, starters, and transformers.

3.06 TESTS AND INSPECTIONS

- A. Tests and inspection requirements shall be coordinated with Division I.
- B. Date for final acceptance test shall be sufficiently in advance of completion date of contract to permit alterations or adjustments necessary to achieve proper functioning of equipment prior to contract completion date.
- C. Conduct re-tests as directed by Architect on portions of work or equipment altered or adjusted as determined to be necessary by final acceptance test. No resultant delay or consumption of time as a result of such necessary re-test beyond contract completion date shall relieve Contractor of his responsibility under contract.
- D. Put circuits and equipment into service under normal conditions, collectively and separately, as may be required to determine satisfactory operation. Demonstrate equipment to operate in accordance with requirements of these specifications. Perform tests in the presence of Architect. Furnish instruments and personnel required for tests.
- E. Final Inspection:
 - 1. At the time designated by the Architect, the entire system shall be inspected by the Architect and Engineer. The contractor or his representative shall be present at this inspection.
 - 2. Panelboards, switches, fixtures, etc., shall be cleaned and in operating condition.
 - 3. Certificates and documents required hereinbefore shall be in order and presented to the Architect prior to inspection.
 - 4. Panel covers, junction box covers, etc., shall be removed for visual inspection of the wire, bus bars, etc.
 - 5. After the inspection, any items which are noted as needing to be changed or corrected in order to comply with these specifications and the drawings shall be accomplished without delay.
- F. The contractor shall provide a thermographic test using an independent testing laboratory using an infrared scanning device. This test shall include but not limited to all switchboards, distribution panelboards, panelboards, automatic transfer switches and other electrical distribution devices. This test shall be conducted to locate high temperature levels. This test shall be conducted between 3 to 8 months after occupancy, but not beyond the one year warranty period. Submit test to the architect and engineer using test reporting forms. All unacceptable conditions shall be corrected prior to the end of the warranty period.

END OF SECTION 26 02 00

SECTION 26 05 19 - WIRE, CABLE AND RELATED MATERIALS**PART 1 - GENERAL****1.01 SCOPE**

- A. Provide 600 volt building wire, cable and connectors and 300 volt wire, cable and connectors.
- B. **WORK INCLUDED:** Include the following Work in addition to items normally part of this Section.
 - 1. Wiring for lighting and power.
 - 2. Automatic Control Wiring.
 - 3. Connection of equipment shown.
 - 4. Fire Alarm System.
 - 5. Voice Communications and Sound System.
- C. **WORK SPECIFIED ELSEWHERE:**
 - 1. Heating, ventilating, and air conditioning equipment.
 - 2. Structured cabling system.
 - 3. Coaxial cables

1.02 STANDARDS

- A. UL83
- B. ASTM B-3
- C. All wire cable and connectors shall be UL approved.

1.03 ACCEPTABLE MANUFACTURERS

- A. **600 VOLT WIRE AND CABLE**
 - 1. Southwire
 - 2. Encore
 - 3. Cerro
 - 4. Tyco Thermal Controls
- B. **300 VOLT WIRE AND CABLE**
 - 1. Westpenn
 - 2. Beldon
 - 3. Alpha
 - 4. Tappan - Southwire
- C. **FLEXIBLE CABLE SYSTEMS**
 - 1. AFC Modular Cable Systems
- D. **CONNECTORS**

1. AMP - TYCO
2. Burndy
3. Ideal
4. 3M
5. O.Z. Gedney
6. Thomas & Betts

1.04 SUBMITTALS

- A. Shop drawings shall include, but not limited to:
1. Cutsheets of wire, cable and connectors to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 WIRING

- A. All wire shall be new and continuous without weld, splice, or joints throughout its length. It must be uniform in cross-section, free from flaws, scales and other imperfections.
- B. WIRE MATERIAL: Soft drawn, annealed, 98% pure copper, with tin coating. Aluminum wiring is not acceptable.
- C. TYPES:
1. Provide type **THHN/THWN** insulation for all buried feeders and service entrance conductors.
 2. Provide type "THHN/THWN" insulation for all branch circuits and above grade feeders.
 3. All wire No. 8 and larger shall be stranded. All wire No. 10 and smaller shall be stranded or solid.
 4. Provide type "XHHW" or other 90 degrees insulation wiring for branch circuit wiring installed through continuous rows of fluorescent fixture bodies.
 5. All 300-volt cable including but not limited to telephone, fire alarm, data, CATV and security shall be UL listed for use in return air plenums.
- D. CONDUCTOR SIZES
1. Feeder conductors shall be sized for a maximum of 2% drop in rated voltage at scheduled load.
 2. Branch circuit conductors shall be sized for a maximum 3% drop in the rated voltage to the longest outlet on the circuit.
 3. Minimum wire shall be No. 12, unless otherwise shown on Drawings or required by Code.
- E. COLOR CODING: No. 6 or larger shall use tape for color coding. No. 8 and smaller wire shall be color coded in accordance with the governing authority requirements or as follows:

<u>120/208 VOLT</u>	<u>277/480 VOLT</u>	<u>120/240 VOLT</u>
NEUTRAL: White	Neutral: Gray	Neutral: White
PHASE A: Black	Phase A: Brown	Phase A: Black
PHASE B: Red	Phase B: Purple	Phase B: Orange
PHASE C: Blue	Phase C: Yellow	Phase C: Blue
GROUND: Green	Ground: Green	Ground: Green

2.02 GROUNDING

Permanently connect all conduit work, motors, starters, and other electrical equipment to grounding system in accordance with the National Electrical Code.

PART 3 - EXECUTION

3.01 WIRE

- A. Do not pull wire into conduit until Work of an injurious nature is completed. Where two or more circuits run to a single outlet box, each circuit shall be properly tagged. Wyreze or approved equal may be used as a lubricant where necessary.
- B. Splices shall be fully made up in outlet boxes with compression crimp-on type splice connectors.
- C. Joints and splices will not be permitted in service entrance or in feeders. Joints in branch circuits will be permitted where branch circuits divide, and then shall consist of one through-circuit to which the branch shall be spliced. Joints shall not be left for the fixture hanger to make. Connect joints and splices with Buchanan Series "2000" solderless connectors complete with insulating caps or properly sized wire nuts.
- D. All stranded conductors shall be furnished with lugs or connectors.
- E. Connectors furnished with circuit breakers or switches shall be suitable for copper wire termination.
- F. "Sta-Cons" shall be used to terminate stranded conductors on all switches and receptacles.
- G. All stranded #10 and small conductors shall be terminated with an approved solderless terminal if the device or light fixture does not have provisions for clamp type securing of the conductor.
- H. The jacket for all travelers used on 3-way and 4-way switches shall be pink.

3.02 BALANCING SYSTEM

The load on each distribution and lighting panel shall be balanced to within 10% by proper arrangement of branch circuits on the different phase legs. Provide written documentation showing results. Submit with O & M manuals.

3.03 LOW VOLTAGE WIRING

- A. Low voltage wiring shall be plenum rated. All wiring in mechanical rooms, electrical rooms, drywall ceiling, inaccessible areas, underground, plaster ceiling, inside concealed

walls areas exposed to occupant view, and other areas subject to physical damage shall be run in conduit.

- B. Low voltage wiring shall be routed in separate raceways from power wiring systems.
- C. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of wiring. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel.

3.04 CABLE SUPPORTS

- A. Provide cable supports in all vertical raceways in accordance with Article 300-19 of the NEC.

3.05 DEFECTS

- A. Defects shall include, but are not to limited to, the following:
 - 1. Tripping circuit breakers under normal operation.
 - 2. Improperly connected equipment.
 - 3. Damaged, torn, or skinned insulation.

END OF SECTION

SECTION 26 05 26 - GROUNDING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

- A. WORK COMBINED WITH OTHER SECTIONS: Combine the work specified herein with the following Sections to form a single responsibility for the Work:
 - 1. Electrical.
 - 2. Basic materials and methods.
- B. Provide electrical service, equipment and wiring device grounding as shown, scheduled and as specified.
- C. The types of grounding include, but not limited to, the grounding bonding of all equipment devices, building steel piping, and as required by the National Electrical Code, Local Inspection Department and Power Company.

1.03 STANDARDS

- A. NATIONAL ELECTRICAL CODE (NFPA-70)
- B. Local municipal and State codes that have jurisdiction.
- C. NECA

1.04 ACCEPTABLE MANUFACTURES

- A. Provide grounding products manufactured by Copperweld and Cadweld.

1.05 SUBMITTALS

- A. Shop drawings shall include, but not limited to the following:
 - 1. Cut sheets of ground rods, clamps and connectors.
 - 2. Grounding system diagram.

PART 2 - PRODUCTS

- A. GENERAL: Provide all materials required to construct a complete grounded electrical system.
- B. GROUND RODS: Ground rods shall be 3/4" inch diameter by 10 feet long construction with copper jacket and a steel core.
- C. CLAMPS: Ground clamps shall be copper except for steel or iron pipes in which the clamps shall be galvanized iron.
- D. CONDUCTORS: Conductors shall be connected by means of an approved pressure connector or clamp.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. GENERAL: Install grounding system as shown and specified to ensure a properly grounded system.
- B. SERVICE ENTRANCE GROUNDING SYSTEM: Provide a main bonding jumper between the neutral and ground bus of each switchboard. Route a separate grounding electrode conductor in conduit from each **switchboard** to the ground rod grid, incoming cold water piping system,. Provide a bonding jumper around water meter. The grounding electrode conductor shall be stranded copper, 98% conductivity and shall be run continuous without splices or joints and installed at least 12" below grade.
- C. BUILDING STEEL AND PIPING SYSTEM: Install a bonding jumper between building steel and metallic piping systems to bond them to the electrical grounding system.
- D. NEUTRAL: The neutral shall be grounded only at the service entrance and other separately derived systems. The neutral shall be kept separate from the grounding system and shall not be used as a ground.
- E. GROUNDING SEPARATELY DERIVED ALTERNATING CURRENT SYSTEM
 - 1. TRANSFORMERS: The center point (neutral) of each wye connected transformer shall be bonded to the case and a grounding electrode conductor shall be connected to a ground rod or building steel.
 - 2. STANDBY EMERGENCY GENERATOR: The generator neutral shall be bonded to the generator when a 4 pole switched neutral automatic transfer switch is specified.
- F. GROUNDING CONDUCTOR: A grounding conductor and metallic conduit system shall bond all equipment served by the electrical system. Provide a flexible bonding jumper for isolated metallic piping and ductwork and around expansion fittings and joints.
- G. CONDUIT GROUNDING BUSHING:

Conduit terminating in equipment that has a ground bus such as switchboards, panelboards, etc., shall have grounding bushings installed. Ground each conduit by means of a grounding bushing and to the ground bus in the equipment.
- H. MOTORS: The frame of all motors shall be grounded.
- I. SPECIAL GROUNDING: Provide a #6 AWG copper grounding conductor for each telephone board, television system, etc. Terminate the grounding conductor on ground bus and to the building electrical grounding system. Refer to 800-40(d) and 820-40(d) of the NEC.
- J. REMOTE PANELBOARDS: Provide a grounding electrode conductor all remote panels as required by the NEC and shown on drawings.
- K. LIGHTING FIXTURES: Flexible fixture whips containing a green grounding conductor shall be used to connect light fixtures. Flexible fixture whips shall not exceed ten feet.
- L. RECEPTACLES: All receptacles shall be grounded using the branch circuit grounding conductor. Receptacles shall use an approved grounding yoke.

- 3.02 TESTING: Perform a ground resistance test using a biddle analog or digital portable earth/ground resistance tester. The system resistance shall not exceed 5 OHMS. Provide additional electrodes as required (refer to 250-84 of the NEC or the most current edition 250-56). Test shall not be conducted following wet weather. Provide personal instruments to conduct these tests and submit certified test for review. Test shall be verified by Engineer.

END OF SECTION

SECTION 26 05 33

RACEWAYS

PART 1 - GENERAL

1.01 SCOPE

- A. Provide electrical raceways and fittings as shown, scheduled and specified.
- B. The types of raceways and fittings required are as follows:
 - 1. Rigid hot-dipped galvanized steel conduit (RGS)
 - 2. Intermediate hot-dipped galvanized steel conduit (IMC)
 - 3. Electrical metallic tubing (EMT)
 - 4. PVC
 - 5. Flexible metal conduit
 - 6. Liquid-tight flexible metal conduit (non-metallic is not acceptable)
 - 7. PVC coated rigid galvanized steel conduit
 - 8. Aluminum Rigid Conduit (ARC)

1.02 STANDARDS

- A. ANSI, C80.1 & C80.3
- B. NEMA FB-1
- C. NEMA TC3
- D. UL, 6, 797 & 1242

1.03 ACCEPTABLE MANUFACTURERS

- A. Raceways
 - 1. Allied
 - 2. Triangle
 - 3. Republic
 - 3. Carlon
 - 4. Wheatland Tube
 - 5. Cantex
 - 6. Western Tube
 - 7. Robroy Industries
- B. Fittings
 - 1. Appleton
 - 2. Crouse Hinds
 - 3. Steel City
 - 4. O.Z. Gedney
 - 5. Carlon
 - 6. Raco, Inc.

1.04 SUBMITTALS

- A. Shop drawing shall include but not be limited to:

1. Cutsheets for raceways and fitting.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 PROVIDE CONDUIT AS FOLLOWS:

- A. Except as noted or otherwise specified, all wiring shall be installed in galvanized rigid steel, rigid aluminum conduit or electrical steel tube (EMT) of the proper size to contain the number of conductors required in accordance with the latest edition of the N.E.C. Where conduit sizes are shown on the drawings, these shall take preference. Contractor shall epoxy coat galvanized rigid steel conduit for use in natatoriums.
- B. EMT in sizes up to 4 inches when concealed or not exposed to damage and located indoors only.
- C. PVC coated rigid galvanized steel shall be used for all penetrations of slab on grade.
- D. Rigid galvanized steel where embedded in concrete or masonry construction, mechanical yard or in exterior/interior applications where subject to damage.
- E. Rigid aluminum shall be used in exterior applications. (i.e. roof, top of canopies)
- F. Carlon Schedule 40 PVC may be utilized underground, in or below slab where shown on the construction documents.
- G. MINIMUM SIZE: 3/4inch. All homeruns shall be 3/4" minimum. 1/2" conduit may be used for drops down walls to a single receptacle or switch.
- H. PVC coated rigid galvanized steel conduit shall be coated inside and outside.
- I. PVC coated rigid galvanized steel conduit shall be used at cooling towers, corrosive areas and pool pump rooms.
- J. Fixture whips: Refer to 26 51 00 for additional information.
- K. Flexible metal shall be used for connecting rotating equipment installed in conditioned spaces.
- L. Sealtite shall be used for connecting rotating equipment installed in non-conditioned spaces and outside.
- M. Bear the stamped approval of the UL and be approved by the Architect and Engineer.

2.02 Branch circuits run underground shall be run in Carlon Schedule 40 PVC conduit. Install ground wire in accordance with NEC table 250-122.

2.03 FITTINGS

RACEWAYS

- A. Couplings for rigid steel or intermediate conduit shall be hot dipped galvanized steel. Set screw type is not acceptable.
- B. Steel or malleable iron fittings shall be used on all other raceway types except for PVC.
- D. EMT systems shall utilize steel insulated throat, set screw connectors and steel set screw couplings in all indoor conditioned spaces. EMT system shall utilize steel insulated throat, threadless, watertight compression type connectors and steel threadless watertight compression type coupling in all non-conditioned spaces.
- C. Coupling and connectors accessories and fittings for PVC coated rigid galvanized steel shall be PVC coated.
- D. Metal sealtite fittings shall be steel. Plastic is not acceptable.
- E. Provide nylon bushing on end of all low voltage cabling system conduits (sleeves, rough-ins, etc.).

PART 3 - EXECUTION

3.01 CONDUIT

A. GENERAL

The Drawings are diagrammatic, and are intended to show the general location of outlets, devices, fixtures, and arrangement and control of circuits. The Contractor shall determine exact locations by actual measurement of the building or by reference to the Architectural Drawings.

- B. Of such size, and so installed that conductors may be drawn in without injury or excessive strain.
- C. Where entering panels, pull boxes, junction boxes, or outlet boxes, shall be secured in place with lock nuts inside and outside, and insulated bushings inside.
- D. Have Red seal type VCC or approved equal cable supports in risers, as required by N.E.C.
- E. Have ends reamed after cutting and application of die.
- F. Keep conduit corked and dry during construction, and swab out before conductors are pulled.
- G. Have bends and offsets made with approved tools. Bends or offsets in which the pipe is crushed or deformed shall not be installed.
- H. Where not embedded in concrete or masonry, be firmly secured by approved clamps, half-straps or hangers.
- I. Have O.Z. Gedney or approved equal expansion fittings where crossing building expansion joints.
- J. EXPANSION JOINTS: Make provision for expansion and shifting of metal or PVC conduits where risers occur from underground.

- K. Except in the mechanical equipment rooms, run conduit concealed, and by the shortest practicable route between outlets. Install risers, drops, and offsets necessary to avoid conflict with ductwork, piping, structural members, and similar items.
- L. Install exposed conduit in mechanical rooms, and elsewhere as indicated, parallel to horizontal and vertical lines of walls, ceilings, and floors.
- M. In general, fluorescent fixtures in finished areas having suspended acoustical ceilings shall be connected to outlet boxes of lighting grid by flexible metal conduit; length not to exceed ten feet.
- N. Outlet boxes in partitions shall never be set back to back. They shall be offset to prevent undue noise transmission from room to room.
- O. Concealed conduit shall run in as direct manner as possible using long bends. Exposed conduit shall be run parallel with or at right angles to the lines of the building; and all bends shall be made with standard conduit elbows or conduit benders. Not more than equivalent of four quarter bends shall be used in any run between terminals and cabinet, of between outlet or junction boxes. Approved condulets shall be used in lieu of conduit elbows where ease of installation and appearance warrants their use and approved by the engineer. Conduit joints shall be made with approved couplings and unions.
- P. Conduits shall be continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes and shall be electrically continuous throughout. Terminals of all conduits shall be provided with double lock nuts and bushing or terminated on conduit hubs. Use of running threads is prohibited.
- Q. Each entire conduit system shall be installed complete before any conductors are drawn in. Every run of conduit shall be finished before covering up to guard against obstructions and omissions.
- R. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of conduits. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel and set to extend 4" above slab.
- S. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty. All fire rating material shall be installed in accordance with manufacturer's printed instructions.
- T. All conduit shall be cleaned and swabbed to remove all foreign matter and moisture prior to pulling wire and cable. All boxes in which conduits terminate shall be cleaned of all concrete mortar and other foreign matter.
- U. Provide #30 nylon pulling line in all conduits in which permanent wiring is not installed.
- V. All conduit shall be securely fastened and supported using hot galvanized malleable iron one-hole pipe straps, clamps, hanger or other means approved by the engineer. Supports shall be as required by NEC Table 344-3 (B)(2). Tie wire shall not be used as support or securing means. Support conduit independently of ceiling hanger wire. Use all thread rods to support outlet boxes, junction boxes and conduit.
- W. When PVC conduit is routed underground, all stub-up's and 90° elbows shall be PVC

coated rigid galvanized steel. Use PVC coated rigid galvanized steel when penetrating concrete on grade.

- X. Route all conduit above grade unless otherwise noted on the construction documents.
- Y. Contact the Architect and Engineer for an installation review before covering any below grade or above grade conduit.
- Z. All new outlets shall be flush mounted. In remodeled areas where wall construction prohibits flush mounting, provide wiremold 2400 series. Verify exact location and routing with architect before installation.
- AA. Contractor shall not penetrate water proof barriers without using proper fitting to maintain barriers. This shall include exterior walls and slabs. Coordinate with Architect for proper methods.

3.02 FITTINGS

- A. Install approved expansion fitting in all conduit runs in excess of 150 feet or when crossing building expansion joints.

3.03 CONDUIT CORROSION PROTECTION

- A. Branch circuit conduits installed in concrete slabs on fill or grade shall be positioned in a manner to ensure complete concrete cover. In no case shall such conduits be exposed below or above the slab surfaces, or penetrate the waterproof membrane.
- B. At locations where metallic conduits pass through slabs on grade or transitions below grade, PVC coated rigid galvanized conduit shall be used.

3.04 OUTLET AND JUNCTION BOXES

- A. Provide an approved galvanized outlet box with adequate volume for number of conductors installed.
- B. Provide standard galvanized switch boxes of the required number of gangs. Switch boxes where conduit is exposed shall be handy boxes or approved equal.
- C. Outlet boxes for receptacles shall be similar to Universal 52151 with suitable raised cover. Receptacle boxes where conduit is exposed shall be handy boxes or approved equal.
- D. Weatherproof boxes shall be FS or FD. Provide these boxes in all non-conditioned areas, exterior areas and natatoriums.
- E. Outdoor boxes shall be NEMA 3R, with conduit connections made by Myers Hubs.
- F. See notes and details on Drawings for special box requirements.
- G. Provide junction boxes required to facilitate installation of the various conduit systems. Provide support boxes required for risers, each complete with approved cable supports as described elsewhere in this Division.
- H. Outlet boxes for drywall shall be standard galvanized 4" square boxes with the appropriate device cover.
- I. Provide floor outlet fittings for telephone to match fittings for duplex floor receptacles.

- J. Provide 3-1/2" deep gangable masonry boxes in all masonry wall (CMU). Steel City GW-135-G or approved equal.
- K. Provide shallow 4"x4" boxes in all demountable partitions.
- L. Metallic boxes located in fire rated walls or partitions shall be separated by a minimum horizontal distance of 24 in. This minimum separation distance between metallic boxes may be reduced when "Wall Opening Protective Materials" (CLIV) are installed according to the requirements of their Classification. Metallic boxes shall not be installed on opposite side of walls or partitions of staggered stud construction unless "Wall Opening Protective Materials" are installed with the metallic boxes in accordance with Classification requirements for the protective materials.
- M. Junction, pull boxes, condulets, gutters, disconnects, contactors, etc., above 2-foot x 2-foot grid ceilings shall be mounted within 18-inches of ceiling grid. Above 2-foot x 4 – foot grid ceiling they shall be mounted within 30-inches of ceiling grid. All junction box, pull box, gutter openings shall be side or bottom accessible.

3.05 THRU-WALL SEALS

- A. Provide O.Z. Gedney "Thru-wall" seals for all conduits passing through concrete structure below grade, above grade, and floor penetrations below grade. These prevent moisture from entering the building.
- B. Straight sleeves are not acceptable.

3.06 PULL BOXES

- A. Pull boxes shall be provided for conduit systems as required and shall be constructed of galvanized steel of not less than gauge and size specified by National Electrical Code.
- B. Where two or more feeders pass through a common pull box, they shall be tagged to indicate clearly their electrical characteristics, circuit number, and panel designation.

3.07 WIREWAYS

- A. Wireways shall be installed as indicated or required and locations shall be coordinated with architect.
- B. Wireways shall be made of not less than 16-gauge sheet steel for 4 inch and 6 inch square sizes and 14 gauge steel for 8 inch and 12 inch square sizes. Couplings end plates, and knockouts shall be furnished as required. Each section of wireways shall be rigidly supported.
- C. Wiring in wireways shall be neatly bundled, tied and suitably tagged.
- D. The finish shall be ANSI-49 gray epoxy paint applied by a cathodic electrode position paint process over a corrosion resistant phosphate preparation for NEMA 1 wireways. Provide galvanized steel for NEMA 3R wireways. NEMA 3R wireways and auxiliary gutters are for horizontal mounting only.

3.08 UNDERGROUND DUCTBANK SYSTEM

- A. DUCT SYSTEM

1. The duct system shall consist of Schedule 40 PVC or type 1-EB PVC conduits encased in concrete as detailed on the drawings. Use rigid conduit for stub-ups and the last ten feet at the end of each ductbank. Duct lines shall be laid to a minimum grade of 4 inches per 100 feet and shall be free from either horizontal or vertical waves. Duct lines shall be straight unless otherwise noted on the drawings. Duct lines shall be installed so that the top of concrete in encased duct lines is not less than 24 inches below finished grade or finished paving at any point. Changes in direction or runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet. The long sweep bends may be made up of one or more curved or straight sections and/or combinations thereof using five degree angle couplings. Conduit shall be thoroughly cleaned before using or laying. During construction and after the duct line is completed, the ends of the conduit shall be plugged to prevent water washing mud into the conduits. Particular care shall be taken to keep the conduits clean of concrete, dirt, and any other substance during the course of construction.
 2. Each single conduit of the duct bank shall be completely encased in steel reinforced concrete as indicated. The thickness of concrete encasement indicated is the minimum thickness, and may be increased to fit the actual shape of trench.
 3. Concrete for duct bank envelopes shall be standard 2000 psi concrete mix as described in Division 03,
 - a. Envelopes may be poured directly against sides of trenches if the "cut" is clean, even and free of loose material. All loose dirt and extraneous material shall be removed from the trenches before and during the pouring of concrete to ensure sound envelopes. Concrete shall be carefully spaded during pouring to eliminate all voids under and between the conduit and honeycombing of the exterior surfaces. Power driven tampers or agitators shall not be used, unless specifically designed for the application, in order to ensure that the water-tightness of the conduits is not destroyed.
 - b. Generally, each run of envelopes shall be poured in one continuous operation. Where more than one pour is necessary, each pour shall terminate in a vertical plane. Partial pours shall not terminate in horizontal or angular planes.
- B. For normal underground installation see Section 26 02 00 -3.01 for Excavating and Backfilling.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.01 SCOPE

- A. Provide panelboards as shown, scheduled and as specified herein.
- B. The types of panelboards include:
 - 1. Lighting and appliance panelboards.
 - 2. Power distribution panelboards.

1.02 STANDARDS

- A. Products shall be designed, manufactured, tested and installed in compliance with applicable standards.
- B. Products shall conform to all applicable UL standards and shall be UL-labeled.

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide one of the following manufacturers:
 - 1. General Electric Company
 - 2. Square D Company
 - 3. Siemens
 - 4. Eaton

1.04 SUBMITTALS

- A. Shop drawings shall include, but not be limited to:
 - 1. Cutsheets of all enclosures, circuit breakers, fusible switches, bussing, rating, schedules and all accessories clearly labeled.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 - 1. National Electrical Code.
 - 2. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. General

Furnish and install power distribution, lighting and appliance panelboards **[and load centers]** as indicated in the panelboard schedule and as shown on the plans. Power distribution panelboards shall be equipped with fusible switches or circuit breakers as shown on the schedule. Panelboards shall be equipped with thermal-magnetic, molded case circuit breakers of frame and trip ratings as shown on the schedule.
- B. Busing Assembly and Temperature Rise

Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on the panelboard schedule. Such ratings shall be established by heat rise tests with maximum hot spot temperature on any connector or bus bar not to exceed 50°C. rise above 40°C ambient. Heat rise test shall be conducted in accordance with Underwriters Laboratories Standard UL 67. The use of conductor dimensions will not be accepted in lieu of actual heat tests. All current carrying parts of the bus shall be tin or silver plated copper.

1. Bus structure shall be insulated. Bus bar connections to the branch circuit breakers shall be distributed phase or phase sequence type and shall accept bolt-on circuit breakers for lighting and appliance panelboards.

Provide a bare uninsulated and/or insulated ground bus and full size neutral bus as required and indicated in each panelboard enclosure.

C. Distribution Panelboards

1. Circuit breakers shall be equipped with individually insulated, braced and protected connectors. The front faces of all circuit breakers shall be flush with each other. Large, permanent, individual circuit numbers shall be affixed to each breaker in a uniform position. Tripped indication shall be clearly shown by the breaker handle taking a position between "ON" and "OFF". Provisions for additional breakers shall be such that no additional connectors will be required to add breakers. Circuit breakers shall be of the frame size, trip setting and interrupting capacity as indicated on the drawings.

Current limiting circuit breakers shall be equal to Square D Company "I-Limiter" Series.

Circuit breakers shall be conventional interrupting capacity but in no case be less than the following symmetrical amperes RMS.

FRAME SIZE/ VOLTAGE	CONVENTIONAL INTERRUPTING CAPACITY	HIGH INTERRUPTING CAPACITY	CURRENT LIMITING
100AF/240V	10,000 AIC	65,000 AIC	200,000 AIC
225AF/240V	10,000 AIC	65,000 AIC	200,000 AIC
400AF/240V	42,000 AIC	65,000 AIC	200,000 AIC
600AF/240V	42,000 AIC	65,000 AIC	200,000 AIC
800AF/240V	42,000 AIC	65,000 AIC	200,000 AIC
1000AF/240V	42,000 AIC	65,000 AIC	200,000 AIC
1200AF/240V	42,000 AIC	65,000 AIC	200,000 AIC
100AF/480V	14,000 AIC	25,000 AIC	200,000 AIC
225AF/480V	22,000 AIC	65,000 AIC	200,000 AIC
400AF/480V	30,000 AIC	35,000 AIC	200,000 AIC
600AF/480V	30,000 AIC	65,000 AIC	200,000 AIC
800AF/480V	30,000 AIC	65,000 AIC	200,000 AIC
1000AF/480V	30,000 AIC	65,000 AIC	200,000 AIC
1200AF/480V	50,000 AIC	65,000 AIC	200,000 AIC

D.

480/277 Volt Lighting Panelboards

Main breakers shall be vertically mounted. Horizontally mounted main breakers are not

acceptable.

Circuit breakers shall be bolt-on thermal-magnetic, molded case circuit breakers. Breakers shall be 1, 2 or 3 pole with an integral crossbar to assure simultaneous opening of all poles in multiple circuit breakers. Breaker shall have an over-center, trip-free, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication. Handles shall have "ON", "OFF" and "TRIPPED" positions. Circuit breakers shall be UL listed in accordance with UL Standard 489 and shall be rated 277 volt ac (single pole, 15-30 amperes) or 480Y/277 volts ac (2 and 3 pole) with continuous current ratings as noted on the plan. Interrupting ratings shall be a minimum of 18,000 rms symmetrical amperes at 277 volts ac (single pole) or 480Y/277 volts ac (2 and 3 pole). Single pole, 15 and 20 ampere circuit breakers intended to switch fluorescent lighting loads on a regular basis shall carry the SWD marking.

1. The lugs for terminating conductors shall be rated at 75° C on all panel boards and circuit breakers.

E. 240 Volt Lighting and Appliance Panelboard

Main breakers shall be vertically mounted. Horizontally mounted main breakers are not acceptable.

Circuit breakers shall be bolt-on thermal-magnetic, molded case circuit breakers. Breakers shall be 1, 2, or 3 pole with an integral crossbar to assure simultaneous opening of all poles in multiple circuit breakers. Breakers shall have an overcenter, trip-free, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication. Handles shall have "ON", "OFF" and "TRIPPED" positions.

Circuit breakers shall be UL listed in accordance with UL standard 489 and shall be rated 240 volts ac maximum with continuous current rating as noted on the plans.

Branch circuit breakers feeding convenience outlets shall have sensitive instantaneous trip settings of not more than 10 times the trip settings of the breaker to prevent repeated arcing short resulting from frayed appliance cords. Single pole 15 and 20 ampere circuit breakers shall be UL listed as "Switching Breakers" at 120V ac and carry the SWD marking.

UL Class A ground fault circuit protection shall be provided on all receptacle circuits serving wet areas and on all 120V ac branch circuits as specified on the plans or panelboard schedule. This protection shall be an integral part of the branch circuit breaker which also provides overload and short circuit protection for branch circuit wiring. Tripping of a branch circuit breaker containing ground fault circuit interruption shall not disturb the feeder circuit to the panelboard. A single pole circuit breaker with integral ground fault circuit interruption shall require no more panelboard branch circuit space than a conventional circuit breaker. Circuit breakers shall be rated 10,000 AIC at 240V unless otherwise noted on plans.

Provide double sized neutral bus with panels served from a non-linear transformer or when indicated on drawings. This shall be a UL approved assembly.

F. Cabinets and Fronts

The panelboard bus assembly shall be enclosed in a steel cabinet with multiple knockouts. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets. Wiring gutter space shall be in accordance with UL Standard 67 for panelboards. The box shall be fabricated from galvanized steel or equivalent rust

resistant steel. All NEMA-1 lighting and receptacle panels shall have hinged front covers. The front cover shall have a door with hinges, latch and a lock. The hinged front covers shall allow full access to the circuit breaker gutter area without having to remove the entire front cover. All panelboard lock shall be keyed alike. Circuit breaker and fusible distribution panels shall have four-piece trims. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. Provide NEMA 1 enclosure where installed indoors unless otherwise noted. Provide NEMA 3R enclosure where installed outside or in a sprinkled area.

G. Safety Barrier

The distribution panelboard interior assembly shall be dead front with panelboard front removed. Main lugs or main breakers shall have barriers on five sides. The barrier in front of the main lugs shall be hinged to a fixed part of the interior. The end of the bus structure opposite the mains shall have barriers.

H. Integrated Equipment Short Circuit Rating

Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule or on the plans. This rating shall be established by testing with the over-current devices mounted in the panelboard. The short circuit tests on the over-current devices and on the panelboard structure shall be made simultaneously by connecting the fault to each over-current device with the panelboard connected to its rated voltage source. Method of testing shall be per Underwriters Laboratories Standard UL 67. The source shall be capable of supplying the specified panelboard short circuit current or greater. Testing of panelboard over-current devices for short circuit rating only while individually mounted is not acceptable. Also, testing of the bus structure alone is not acceptable. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install panelboards, including electrical connections, in accordance with manufacturers written instructions, NEC and recognized industry practices.
- B. Housekeeping Pads: Mount floor mounted panelboards on 4 inch high concrete housekeeping pads.
- C. Fuses: Install fuses of the rating and class as shown in each fusible distribution panel scheduled on drawings.
- D. Conduits: Stub up three one inch conduits to an accessible location above the ceiling for each recessed panelboard.

3.02 IDENTIFICATION

- A. Nameplate: Each panelboard shall have an engraved bakelite nameplate. Nameplates shall be white with black letters and show panel designation. Nameplates shall be attached with stainless steel screws.
- B. Directory Card: Place a neat, carefully typewritten directory card identifying the load served by each branch circuit in the frame on the panel door, under a clear plastic cover.

Spares and spaces shall be written with erasable pencil for future use.

- C. Replacement Components: Where circuit breakers or fuses are applied in compliance with the series combination ratings marked on the equipment by the manufacturers, the equipment enclosure(s) shall be legibly marked in the field to indicate the equipment has been applied with a series combination rating. The marking shall be readily visible and state "caution - Series Rated System." (NEC 110-22). Nameplate shall also identify replacement components.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.01 SCOPE

- A. Provide wiring devices as shown; scheduled, required and as specified.
- B. The types of wiring devices required include:
 - 1. Receptacles
 - 2. Switches
 - 3. Coverplates

1.02 STANDARDS

- A. NEMA WD-1
- B. NEMA WD-5
- C. UL
- D. Federal Spec WC-596-F and WS-896

1.03 ACCEPTABLE MANUFACTURERS

- A. Leviton Manufacturing
- B. Hubbell
- C. Pass & Seymour

1.04 SUBMITTALS

- A. Shop drawings shall include but not limited to:
 - 1. Cut sheets of all devices indicating NEMA configuration, rating, materials, color, and all accessories.
 - 2. Cut sheets of all coverplates indicating materials, color and any engraving specified on drawing or in the specifications.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. GENERAL

- 1. Provide factory assemble wiring devices with the rating type and color as required and specified for the service indicated.
- 2. Provide matching one-piece multiple gang plates where switches are ganged.

- 3. Provide wall plates for each receptacle furnished. Architect reserves the right to select wiring device styles and colors to match wall finish.
- 4. Wall plates shall be of same manufacturer as devices.

2.02 SWITCHES

[SELECT TOGGLE OR ROCKER TYPE SWITCHES AND COLOR]

- A. Provide specification grade **[Ivory, White, Gray, Red]** toggle switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.
- B. Wall switches shall be 20 amp, 120-277 volt and shall be Leviton, Hubbell or P&S as follows:
 - 1. SINGLE POLE SWITCHES:
Leviton 1221-2, Hubbell HBL 1221, P&S PS20AC1
 - 2. DOUBLE POLE SWITCHES:
Leviton 1222-2, Hubbell HBL 1222, P&S PS20AC2
 - 3. THREE WAY SWITCHES:
Leviton 1223-2, Hubbell HBL 1223, P&S PS20AC3
 - 4. FOUR WAY SWITCHES:
Leviton 1224-2, Hubbell HBL 1224, P&S PS20AC4
 - 5. MOMENTARY CONTACT SWITCHES:
Leviton 1257, Hubbell HBL 1557, P&S 1251
 - 6. THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL 1385, P&S 1225
 - 7. KEY TYPE LOCKABLE CORBIN STYLE:
Leviton 1221-2KL with 2KL key or P&S PS20AC1-KL with 4609 key for each switch, Hubbell #HBL 1221-RKL.
- C. Dimmers: Provide Lutron Nova "T" series or Leviton or as shown on drawings. Wall box dimmers shall be sized to handle the load. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.
- D. Light Handle Switches: Provide Leviton 1221-7L-LHC, Hubbell HBL1221-IL, P&S PS20AC1-ISL lighted handles to switch emergency lights were noted on the drawings.

OR

- A. Provide specification grade **[Ivory, White, Gray, Red]** Decora style rocker switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.
- B. Wall switches shall be 20 amp, 120-277 volt and shall be Leviton, Decora, Pass & Seymour Decorator, or Hubbell Style line Series 21 as follows:
 - 1. SINGLE POLE SWITCHES: Leviton 5621-2, P&S 2621, Hubbell 2121
 - 2. DOUBLE POLE SWITCHES: Leviton 5622-2, P&S 2622, Hubbell 2122
 - 3. THREE WAY SWITCHES: Leviton 5623-2, P&S 2623, Hubbell 2123
 - 4. FOUR WAY SWITCHES: Leviton, 5624-2, P&S 2624, Hubbell 2123
 - 5. MOMENTARY CONTACT SWITCHES:
Leviton, 1257, Hubbell HBL 1557, P&S 1251
 - 6. THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL 1385, P&S 1225

- C. Dimmers: Provide Lutron Nova "T" series or Leviton wall box dimmers sized to handle the load. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.
- D. Light Handle Switches: Provide Leviton 5649-2 or P&S 2625 lighted handles to switch emergency lights where noted on the drawings.

2.03 RECEPTACLES

[SELECT CONVENTIONAL OR DECORATOR TYPE RECEPTACLES AND COLOR]

- A. Provide specification grade **[Ivory, White, Gray, Red]** receptacles where indicated on the Drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.
- B. Receptacles shall be Leviton, Hubbell or Pass & Seymour as follows:
 1. Duplex 20A-125V-self grounding: (Nema configuration 5-20R):
Leviton 5362, Hubbell HBL5362, P&S 5362A
 2. Simplex 20A-125V-Self Grounding: (Nema configuration 5-20R):
Leviton 5361, Hubbell HBL5361, P&S 5361
 3. Isolated ground duplex, 20A-125V: (Orange, Nema configuration 5-20R)
Leviton 5362IG, Hubbell IG5362, P&S IG6300.
 4. Clock hanger receptacle 15A-125V: (Brown with stainless steel plate with hanger, Nema configuration 5-15R).
Leviton 5361-CH, Hubbell 5235, P&S S3733-SS
 5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; (Nema Configuration 5-20R, shall incorporate features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter, Leviton 8899, P & S 2094.
 6. Tamper resistant receptacles 20A-125V (Nema configuration 5-20R):
Leviton 8300-SG, Hubbell HBL8300SG, P&S TR63-H.
 7. Surge Protection Duplex Receptacles 20A-125V, (Nema 5-20R) Hospital grade to include LED light and audible alarm:
Leviton 8380, Hubbell HBL 8362SA, P&S 8300SP
 8. Equipment receptacles shall be coordinated with owner/manufacture requirements and the correct and appropriate receptacle and coverplate shall be installed.

OR

- A. Provide specification grade, Decora type **[Ivory, White, Gray, Red]** receptacles where indicated on the Drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.
- B. Receptacles shall be Leviton, Decora, Hubbell Style Line Series 21 or Pass & Seymour Decorator as follows:
 1. Duplex 20A-125V-self grounding: (Nema configuration 5-20R):
Leviton 16362, P&S 2091 Hubbell 2162.
 2. Simplex 20A-125V-Self Grounding: (Nema configuration 5-20R):
Leviton 16351, P&S 26361, or Hubbell 2161.
 3. Isolated ground duplex, 20A-125V: (Orange, Nema configuration 5-20R)

- 4. Leviton 16362-IG, P&S IG8300XSP (where X denotes color) or Hubbell IG2162. Clock hanger receptacle 20A-125V: (Brown with stain finish stainless steel plate with hanger, Nema configuration 5-20R).
Leviton 5361-CH, Hubbell 5235, P&S S3733-SS
- 5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; GF-5352. (Nema Configuration 5-20R, shall incorporate features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter Leviton 8899 or P&S 2094.
- 6. Tamper resistant receptacles 15A-125V: (Nema configuration 5-20R):
Leviton 16262-SG
- 7. Surge Protection Duplex Receptacles 20A-125V, (Nema 5-20R) Hospital grade to include LED light and audible alarm:
Leviton 8380, Hubbell HBL 8362SA, P&S 8300SP
- 8. Special equipment receptacles shall be coordinated with owner/manufacture requirements and the correct and appropriate receptacle and coverplate shall be installed.

2.04 Floor boxes shall be cast iron as manufactured by Hubbell or equal by Wiremold and as indicated below:

- A. Slab at grade (dual level, fully adjustable type 1).
 - 1. Single gang: #B-2436 w/#SB-3083 carpet flange.
 - 2. Two gang: #B-4233 w/#SB-3084 carpet flange.
 - 3. Three gang: #B-4333 w/#SB-3085 carpet flange.
- B. Slab above grade (shallow, semi-adjustable, type II)
 - 1. Single gang: #B-2414 w/#SB-3083 carpet flange.
 - 2. Two gang: #B-4214 w/#SB-3084 carpet flange.
 - 3. Three gang: #B-4314 w/#SB-3085 carpet flange.
- C. Cover plates shall have brass finish as follows:
 - 1. #S-3825 for duplex flap for duplex receptacles.
 - 2. #S-2425 for data/communications.

2.05 PVC floor boxes manufactured by Wiremold shall be as follows:

- A. Provide #881 dual service PVC floor box with divider and 897CTC cover.

2.06 PLATES

[SELECT PLATE TYPE]

- A. Furnish and install plates on all outlet boxes. Oversize (Jumbo) plates are not acceptable.
- B. **[Plates shall be 302/304 smooth stainless steel.]**
[Plates shall be smooth nylon.]
[Plates shall be 302/304 smooth stainless steel in kitchen and coffee bar areas.]
- C. Provide Taymac Bell, Carlon or Leviton NEMA 3R weatherproof coverplates on all exterior wiring devices. Enclosure shall be suitable for wet locations when in use.
- D. Plates shall be Leviton, Pass & Seymour or Hubbell 302/304 smooth stainless steel on all

receptacles 30 amps and larger.

2.07 Fire rated poke through devices shall be as follows:

- A. Flush fire rated poke through devices shall be Wiremold RC2001 Series (black) with pre-wired 20A, 125V duplex receptacle and (4) individual openings for telephone, signal or Category 5 data cables.
- B. Poke through devices with above floor service fittings shall be Wiremold RC700 Series with (1) 20A, 125V duplex receptacle and telephone data cover plate.

PART 3 - EXECUTION

3.01 WIRING DEVICE MOUNTING HEIGHTS

- A. Unless noted to the contrary on plans, or directed otherwise during the progress of the Work, wiring devices shall be set as follows:
 - 1. Switches 42" above finished floor.
 - 2. Wall mounted receptacles shall be installed vertically at 15 inches to the bottom outlet above finished floor unless otherwise noted or as required by local codes.
 - 3. Wall telephone outlets shall be mounted 15 inches to the bottom above finished floor unless otherwise noted. Mount even with wall mounted receptacles.
 - 4. At locations above counters, set devices at 6 inches above to the centerline counter tops, verify exact mounting height with the architect.

3.02 INSTALLATION (Refer to 26 05 33 for outlet box specifications.)

- A. Wall switches shall be set in a suitable steel box and shall be installed on the strike side of the door as finally hung, whether so indicated on the Drawings or not.
- B. Receptacles shall be installed in a suitable steel box.
- C. The Architect reserves the right to relocate wiring device up to a distance of 5 feet from the location shown, before rough-in, without additional cost.
- D. Provide multi-gang device covers at locations where devices gang together.
- E. Device locations are indicated schematically on the drawings along with the type and mounting height. Final locations and mounting heights shall be coordinated with the Architect on the jobsite, and with shop drawings of equipment; including equipment to be furnished and installed by the Owner. Devices installed in walls covered with vinyl, fabric wallpaper or other special finishes shall be coordinated and verified with the Architect on the job-site.
- F. Stranded wire termination to switches, receptacles, devices and miscellaneous control devices shall be with an approved solderless terminal if clamp type securing is not possible (i.e. Sta-Con crimp on fork tongue connectors; Burndy Type TP-F).
- G. Provide keyed switches in all common areas not monitored by the faculty (i.e. gym, corridors, cafeteria, commons natatoriums).

END OF SECTION

SECTION 26 28 16 - SAFETY AND DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 SCOPE

- A. Provide safety and disconnect switches as shown, scheduled and as specified herein.

1.02 STANDARDS

- A. Products shall be designed, manufactured, tested and installed in compliance with applicable standards.
 - 1. NEMA KS1 - Enclosed switches
 - 2. Federal specification W-S-865C-Heavy duty switches
- B. Products shall conform all applicable UL standards, including UL98 (standard for safety, enclosed and dead front switches) and shall be UL-labeled.

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide one of the following manufacturers:
 - 1. General Electric Company
 - 2. Square D Company
 - 3. Siemens
 - 4. Eaton

1.04 SUBMITTALS

- A. Shop drawings shall include, but not be limited to:
 - 1. Cutsheets of switches with ratings, physical dimensions and all accessories clearly labeled.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 - 1. National Electrical Code.
 - 2. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Furnish and install heavy duty type safety switches with the number of switched poles as indicated on the plans and specifications. All safety switches shall be NEMA Heavy Duty Type HD, and Underwriters Laboratories listed.

2.02 MATERIALS AND COMPONENTS

- A. Switch Interior

All switches shall have switch blades that are fully visible in the "OFF" position when the door is open. Switches shall have removable arc suppressor where necessary, to permit easy access to line side lugs. Lugs shall be front removable and UL listed for 60°C and 75°C copper or aluminum cables. All switches blades and contacts shall be plated copper. Adjust fuse block to accept Class J fuses.

B. Switch Mechanism

Switches shall have a quick-make and quick-break operating handle and mechanism, which shall be an integral part of the box, not the cover. Padlocking provisions shall be provided for locking in the "OFF" position with at least three padlocks. Switches shall have a dual cover interlock to prevent unauthorized opening of the switch door when the handle is in the "ON" position, and to prevent closing of the switch mechanism with the door open. A means shall be provided to permit authorized personnel to release the interlock for inspection purposes. Handle position shall indicate if switch is "ON" or "OFF".

C. Neutral

Provide a solid neutral with the safety switch where a neutral is present in the circuit.

D. Ratings

Switches shall be horsepower rated for ac and/or dc as indicated by the plans. The fused switches shall have Class R rejection fuse clips or adjusted for Class J fuses. UL listed short circuit ratings of the switches, when equipped with Class R fuses, shall be 200,000 symmetrical amperes.

E. Enclosures

1. Indoor switches shall be furnished in NEMA 1 enclosures.
2. Outdoor switches, switches located in wet areas or sprinkled areas shall be furnished in NEMA 3R enclosures.
3. Switches installed in wet areas such as cooling tower areas shall be NEMA 4X stainless steel or fiberglass reinforced polyester.
4. Switches installed in kitchens shall be stainless steel.
5. Switches installed in areas of a corrosive nature and subjected to salt air shall be NEMA 4X stainless steel or fiberglass reinforced polyester.

F. Service Entrance

Switch shall be suitable for use as service entrance equipment when installed in accordance with the National Electrical Code.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install safety and disconnect switches, including electrical connections, and fuses in accordance with manufacturer's written instructions, NEC and recognized industry practices.
- B. Location: Install switches within sight of controllers.
- C. Hubs: Provide bolt-on hubs for rainproof or wet area applications.

3.02 IDENTIFICATION

- A. Nameplate: Each disconnect switch shall have an engraved bakelite nameplate. Nameplates shall be white with black letters and show equipment served. Nameplates shall be attached with stainless steel screws.

END OF SECTION

SECTION 26 51 00 - LIGHTING FIXTURES**PART 1 - GENERAL****1.01 SCOPE**

- A. Furnish and install general and emergency lighting fixtures as noted on the drawings. Fixtures shall be completely wired with lamps installed and shall be in perfect operating condition at the time of substantial completion.
- B. The types of lighting fixtures required for this project include:
 - 1. Fluorescent
 - 2. Incandescent and
 - 3. High-Intensity-Discharge (HID)

1.02 STANDARDS

- A. All fixtures shall conform to all applicable UL standards and shall be UL label including damp and wet location ratings.
- B. All fluorescent ballast shall comply with certified ballast manufacture (CBM) standard and CBM labeled.
- C. NFPA 101
- D. ANSI C82.1
- E. NEMA-LE
- F. IEEE Publication 587 Category "A" (Electronic Ballast)

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide lighting fixtures produced by manufacturers as shown and scheduled.
- B. BALLAST:
 - 1. Provide one of the following manufacturers
 - a. Advance Transformer Company
 - b. Universal Lighting Technologies
 - c. Osram Sylvania
- C. LAMPS:
 - 1. Provide one of the following manufacturers
 - a. General Electric Company
 - b. Osram Sylvania
 - c. North American Philips

1.04 SUBMITTALS

- A. Shop drawings shall include a brochure with a separate cut sheet for each fixture type arranged in alphabetical order with fixture and all accessories/options clearly labeled. Provide performance data for each fixture. Provide an independent test lab report for each fixture if requested by the Architect/Engineer.
- B. Provide ballast and lamp data brochures indicating which lamp and ballast (if required) will be used in each fixture type.

- C. Furnish air handling and heat removal data for light fixtures specified with these requirements.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 1. National Electrical Code.
 2. Local, municipal, or state codes that have jurisdiction.
 3. UL fire resistance directory.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. General:

Provide the size, type and rating of each light fixture shown and scheduled. All light fixtures shall complete with reflectors, lens, trim rings, flanges, lamps, lamp holders, ballast, starters, fuses, wiring, earthquake clips, etc. to provide a complete functioning light fixture.

- B. Lighting Fixture Types:

1. Fluorescent Fixtures
 - a. Fixture ballast and lamp holders shall be pre-wired and installed. Fixture shall be equipped with a top access plate with knockouts for conduit entry. Fixture shall also include knockouts at each end plate for conduit entry.
 - b. Provide disconnect switch as required by the 2008 National Electrical Code.
 - c. Fixtures shall be cold roll steel finished using a multistage iron phosphate pretreatment to ensure maximum bonding and rust inhibitor. Finish shall be a lighting grade, baked white enamel finish with a minimum reflectance of 85%.
 - d. Door frame shall be heavy gauge flush white steel or aluminum and hinged from one side and use a positive spring action latch on the other side for latching.
 - e. Any lamp shall be easily replaced without removing another lamp.
 - f. Fixtures installed in continuous rows shall utilize nipples or other accessories such as snap together plug in connectors supplied by the fixture manufacturer.
 - g. Provide battery ballast for emergency light fixtures.
2. Exit signs
 - a. Exit signs shall meet all federal, state and local codes.
 - b. Provide fire alarm interface relay when required to flash exit signs.
 - c. Provide battery packs for emergency operation when specified.

2.02 BALLASTS - COORDINATE WITH LIGHT FIXTURE SCHEDULE

- A. Fluorescent

1. High efficiency electronic ballast shall be high power factor (98% minimum), operate lamp at 40 KHz, less than 10% total harmonic content, NORMAL BALLAST FACTOR (.88) , crest factor less than 1.7, parallel lamp configuration universal voltage, multi-lamp, class "P" thermally protected, sound "A" rating, encased and potted and 0°F minimum starting temperature. Provide 5 year warranty parts and labor. Ballast shall be Osram Sylvania QHE series or

approved equal by Universal Lighting Technologies or Advance Transformer Company.

1. Program start electronic ballast shall be high power factor 98% minimum), operate lamp at 40 KHz, less than 10% total harmonic content, normal ballast factor 50,000 switching cycles, universal voltage, crest factor less than 1.7, multi-lamp, class "P" thermally protected, sound "A" rating, encased and potted and 0°F minimum starting temperature. Provide 5 year warranty parts and labor. Ballast shall be Osram Sylvania PSN Series or approved equal by Universal Lighting Technologies or Advance Transformer Company.
2. All outdoor ballast unless otherwise noted shall be high power factor, rapid start, class P thermally protected, encased and potted, sound rating B and a 0°F temperature rating. Ballast shall be CBM certified by an ETL and UL approved.
3. Provide suitable dimming ballast where indicated.
4. Compact fluorescent ballast shall be electronic, shall have circuitry designed to shut down the system reliably and safely when lamps have reached their end of life, high power factor, sound rating "A" and UL approved. Provide 5-year warranty, parts and labor.

B. HID

1. Provide high power factor, constant wattage auto-transformer with a -20 degree F temperature rating. Ballast shall have a sound rating of "B" for lamps less than 400 watts. Ballast for recessed downlights or located remotely shall be encased and potted and shall be provided with a splice box. Provide 120 volt tap for auxiliary lamp when specified.

2.03 LAMPS – COORDINATE WITH LIGHT FIXTURE SCHEDULE

- A. F032T8 fluorescent lamps shall be 24,000 hours 3,500°K, 32 watt and low mercury. Life rating is based on 3 hours/start.
- A. Extended life F032 T8 Fluorescent lamps shall be 40,000 hours 3,500°K, 32 watt and low mercury. Life rating is based on 3 hours/start using programmed start ballast.
- B. All incandescent lamps shall be inside frosted, extended life rated for 2500 hours unless otherwise noted. 130 volt lamps may be used to provide extended life.
- C. All HID lamps shall be base up, base down, horizontal, or universal burn as indicated or specified.
- D. All compact fluorescent (T5 and smaller diameter) lamps shall be 3500°K and 4-pin

2.04 EMERGENCY FLUORESCENT BATTERY BALLAST

- A. Provide Bodine #B50 emergency battery ballast for emergency light fixtures using T8 or T12 lamps in 9 or 10 foot ceiling.
- B. Provide Bodine #B30 Emergency Ballast for emergency light fixtures using T8 lamps in ceiling heights greater than 12 feet.
- C. Provide Bodine #B84C emergency battery ballast for emergency light fixtures using compact fluorescent lamps.
- D. Provide unswitched hot leg. Hot leg shall originate from the same branch circuit as required in NEC article 700.12 (F).

PART 3 - EXECUTION

3.01 INSTALLATIONS

A. General

1. Install the type of light fixture where shown and indicated in accordance with manufacturer's written instructions.
2. Provide earthquake clips on all recessed lay-in light fixtures as required by building code.
3. Adjust all adjustable light fixtures, as directed by the Architect.
4. Provide safety chains and wire guards for light fixtures located in gymnasium, multi-purpose rooms, play areas, etc.

B. Coordination

1. The contractor shall verify the type of fixtures with the ceiling types as indicated on the drawings. Any discrepancies shall immediately be brought to the architect's attention before the contractor places his order and accepts delivery. Fixtures shall fit exact in the type of ceiling scheduled. Provide plaster frames, trim rings and other accessories required for a correct fit.
2. Provide supports attached to structural member to support fixtures when the ceiling system cannot maintain support. Provide separate supports for all recessed ceiling mounted HID fixtures.
3. Refer to architectural reflected ceiling plan for the exact location of all light fixtures. Notify the architect for any discrepancies or conflicts with structural, architectural, mechanical piping or ductwork before installation.

C. Mounting

1. Provide support channels to support outlet boxes used support surface mounted light fixtures such as exit signs or downlights.
2. Pendant or surface mounted fixture shall be provided with required mounting devices and accessories, including hickey and stud-extensions, ball-aligners, canopies and stems. Locations of fixtures in mechanical areas shall be coordinated with mechanical contractor. Mounting stems of pendant fixtures shall be of the correct length to uniformly maintain the fixture heights shown on the drawings or established in the field. The allowable variation tolerance in mounting individual fixtures shall not exceed 1/4 inch and shall not vary more than 1/2 inch from the floor mounting height shown on the Drawings. Fixtures hung in continuous runs shall be installed absolutely level and in line with each other. Hanging devices shall comply with Code requirements. Fixtures shall employ single - not twin - stem hangers unless otherwise noted.
3. All structure mounted fixtures (i.e. bracket mounted, pipe mounted and surface mounted) shall be provided with cables of suitable size and weight to support the weight of the fixture. Cables shall be fastened around or fastened to the housing of the fixture. On pendant fixtures, one safety cable of suitable size and weight to support the weight of the fixture assembly shall connect the top of the pendant to the supporting structure by means of welding or bolting, and one safety cable shall connect the housing of the fixture to the bottom of the pendant. Where more than one pendant per fixture occurs, only one pendant must be cabled. Track fixtures for pendant mounted track shall also be supplied with clip-on safety cables of suitable size and weight to support the weight of the fixture.

D. Electrical Connection

1. All light fixtures installed in an accessible suspended ceiling shall be connected from a branch circuit junction box using 1/2" flexible metal conduit or MC cable fixture pigtails not exceeding 8'- 0". All fixtures must be grounded by using a

grounding conductor. Fixture to fixture wiring of fixtures installed in an accessible ceiling is not permitted. Fixture whips shall not lay-on ceiling tile or grid. Provide caddy clips to provide additional support.

- E. Fire Rated Ceiling
 - 1. Provide fire rated canopy or enclosure for all fixtures recessed in a fire rated ceiling. The fire rated canopy or enclosure shall be as required by the UL design number listed in the UL fire resistance directory. Refer to architectural drawing for the UL design number. Coordinate with ceiling installer and manufacturer.
- F. Air Handling Fixtures
 - 1. Install all air handling light fixtures with return air slot in the open position, if it is to be as an air handling fixture. Coordinate with mechanical contractor.

3.02 FINAL INSPECTION

- A. Remove all plastic and protective coating from all fixtures. Fixtures shall be thoroughly cleaned. Replace any damaged fixture or fixture parts including reflectors, louvers, lens and metal parts that show signs of corrosion.
- B. All final incandescent lamps used during construction shall be replaced with new lamps. Replace all other defective ballast, lamps or discolored lamps, showing signs of excessive usage.
- C. Demonstrate proper operation of all fixtures and controls.

END OF SECTION

SECTION 323119 - DECORATIVE METAL GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Prehung Swing Gates to match existing.

1.2 PREINSTALLATION MEETINGS

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

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For fencing and gates.
 - 1. Include plans, elevations, sections, and attachment details.
- C. Samples: For each fence material and for each color specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

PART 2 - PRODUCTS

2.1 PREHUNG SWING GATES

- A. Steel Frames and Bracing: Fabricate members from square steel tubing to match existing metal gates with 16 gauge wall thickness. Hot-dip galvanize frames after fabrication. Hinges to be hidden tamper-resistant.
- B. Gate Hardware: To match existing metal gate. Owner to provide deadbolt and cylinder lockset.
- C. Steel Finish: Primed, Shop painted High-Performance coating.

- D. Screen Material: Match existing

2.2 STEEL AND IRON

- A. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 50, with G90 coating.
- D. Aluminum-Zinc, Alloy-Coated Steel Sheet: ASTM A 792/A 792M, structural quality, Grade 50, with AZ60 coating.

2.3 COATING MATERIALS

- A. Epoxy Primer for Galvanized Steel: Epoxy primer recommended in writing by topcoat manufacturer.
- B. Polyurethane Intermediate Coat and Topcoat: Complying with MPI #72 and compatible with undercoat.

2.4 METALLIC-COATED-STEEL FINISHES

- A. Galvanized Finish: Clean welds, mechanical connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a zinc-phosphate conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780/A 780M.
- C. Powder Coating: Immediately after cleaning and pretreating, apply manufacturer's standard TGIC polyester powder-coat finish to a minimum dry film thickness of 2 mils.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 PREHUNG GATE INSTALLATION

- A. Install frames and gates to match existing metal gates. Make level, plumb, and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION 323119

ATTACHMENT B
HUD Forms and
Conflict of Interest Questionnaire
Form 1295 Certificate of Interested Parties

*(Form 1295 is to be completed online by the **Selected Respondent** and submitted to the Texas Ethics Commission pursuant to Government Code 2252.908 and a copy returned to SAHA with the Certification prior to contract execution. A copy of the 1295 Form is included herein for information purposes only).*

**U.S. Department of Housing and
Urban Development**
Office of Public and Indian Housing

**Instructions to Bidders for Contracts
Public and Indian Housing Programs**

Instructions to Bidders for Contracts

Public and Indian Housing Programs

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1. Bid Preparation and Submission

(a) Bidders are expected to examine the specifications, drawings, all instructions, and, if applicable, the construction site (see also the contract clause entitled **Site Investigation and Conditions Affecting the Work** of the *General Conditions of the Contract for Construction*). Failure to do so will be at the bidders' risk.

(b) All bids must be submitted on the forms provided by the Public Housing Agency/Indian Housing Authority (PHA/IHA). Bidders shall furnish all the information required by the solicitation. Bids must be signed and the bidder's name typed or printed on the bid sheet and each continuation sheet which requires the entry of information by the bidder. Erasures or other changes must be initialed by the person signing the bid. Bids signed by an agent shall be accompanied by evidence of that agent's authority. (Bidders should retain a copy of their bid for their records.)

(c) Bidders must submit as part of their bid a completed form HUD-5369-A, "Representations, Certifications, and Other Statements of Bidders."

(d) All bid documents shall be sealed in an envelope which shall be clearly marked with the words "Bid Documents," the Invitation for Bids (IFB) number, any project or other identifying number, the bidder's name, and the date and time for receipt of bids.

(e) If this solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "No Bid" in the space provided for any item on which no price is submitted.

(f) Unless expressly authorized elsewhere in this solicitation, alternate bids will not be considered.

(g) Unless expressly authorized elsewhere in this solicitation, bids submitted by telegraph or facsimile (fax) machines will not be considered.

(h) If the proposed contract is for a Mutual Help project (as described in 24 CFR Part 905, Subpart E) that involves Mutual Help contributions of work, material, or equipment, supplemental information regarding the bid advertisement is provided as an attachment to this solicitation.

2. Explanations and Interpretations to Prospective Bidders

(a) Any prospective bidder desiring an explanation or interpretation of the solicitation, specifications, drawings, etc., must request it at least 7 days before the scheduled time for bid opening. Requests may be oral or written. Oral requests must be confirmed in writing. The only oral clarifications that will be provided will be those clearly related to solicitation procedures, i.e., not substantive technical information. No other oral explanation or interpretation will be provided. Any information given a prospective bidder concerning this solicitation will be furnished promptly to all other prospective bidders as a written amendment to the solicitation, if that information is necessary in submitting bids, or if the lack of it would be prejudicial to other prospective bidders.

(b) Any information obtained by, or provided to, a bidder other than by formal amendment to the solicitation shall not constitute a change to the solicitation.

3. Amendments to Invitations for Bids

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date on the bid form, or (3) by letter, telegram, or facsimile, if those methods are authorized in the solicitation. The PHA/IHA must receive acknowledgement by the time and at the place specified for receipt of bids. Bids which fail to acknowledge the bidder's receipt of any amendment will result in the rejection of the bid if the amendment(s) contained information which substantively changed the PHA's/IHA's requirements.

(c) Amendments will be on file in the offices of the PHA/IHA and the Architect at least 7 days before bid opening.

4. Responsibility of Prospective Contractor

(a) The PHA/IHA will award contracts only to responsible prospective contractors who have the ability to perform successfully under the terms and conditions of the proposed contract. In determining the responsibility of a bidder, the PHA/IHA will consider such matters as the bidder's:

- (1) Integrity;
- (2) Compliance with public policy;
- (3) Record of past performance; and
- (4) Financial and technical resources (including construction and technical equipment).

(b) Before a bid is considered for award, the bidder may be requested by the PHA/IHA to submit a statement or other documentation regarding any of the items in paragraph (a) above. Failure by the bidder to provide such additional information shall render the bidder nonresponsible and ineligible for award.

5. Late Submissions, Modifications, and Withdrawal of Bids

(a) Any bid received at the place designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and it:

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 20th of the month must have been mailed by the 15th);

(2) Was sent by mail, or if authorized by the solicitation, was sent by telegram or via facsimile, and it is determined by the PHA/IHA that the late receipt was due solely to mishandling by the PHA/IHA after receipt at the PHA/IHA; or

(3) Was sent by U.S. Postal Service Express Mail Next Day Service - Post Office to Addressee, not later than 5:00 p.m. at the place of mailing two working days prior to the date specified for receipt of proposals. The term "working days" excludes weekends and observed holidays.

(b) Any modification or withdrawal of a bid is subject to the same conditions as in paragraph (a) of this provision.

(c) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent either by registered or certified mail is the U.S. or Canadian Postal Service postmark both on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a legible date or the bid, modification, or withdrawal shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, bidders should request the postal clerk to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(d) The only acceptable evidence to establish the time of receipt at the PHA/IHA is the time/date stamp of PHA/IHA on the proposal wrapper or other documentary evidence of receipt maintained by the PHA/IHA.

(e) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent by Express Mail Next Day Service-Post Office to Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" label and the postmark on both the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph (c) of this provision, excluding postmarks of the Canadian Postal Service. Therefore, bidders should request the postal clerk to place a legible hand cancellation bull's eye postmark on both the receipt and Failure by a bidder to acknowledge receipt of the envelope or wrapper.

(f) Notwithstanding paragraph (a) of this provision, a late modification of an otherwise successful bid that makes its terms more favorable to the PHA/IHA will be considered at any time it is received and may be accepted.

(g) Bids may be withdrawn by written notice, or if authorized by this solicitation, by telegram (including mailgram) or facsimile machine transmission received at any time before the exact time set for opening of bids; provided that written confirmation of telegraphic or facsimile withdrawals over the signature of the bidder is mailed and postmarked prior to the specified bid opening time. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for opening of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

6. Bid Opening

All bids received by the date and time of receipt specified in the solicitation will be publicly opened and read. The time and place of opening will be as specified in the solicitation. Bidders and other interested persons may be present.

7. Service of Protest

(a) Definitions. As used in this provision:

"Interested party" means an actual or prospective bidder whose direct economic interest would be affected by the award of the contract.

"Protest" means a written objection by an interested party to this solicitation or to a proposed or actual award of a contract pursuant to this solicitation.

(b) Protests shall be served on the Contracting Officer by obtaining written and dated acknowledgement from —

Director Of Procurement
San Antonio Housing Authority
818 S. Flores
San Antonio, TX 78204

[Contracting Officer designate the official or location where a protest may be served on the Contracting Officer]

(c) All protests shall be resolved in accordance with the PHA's/IHA's protest policy and procedures, copies of which are maintained at the PHA/IHA.

8. Contract Award

(a) The PHA/IHA will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the PHA/IHA considering only price and any price-related factors specified in the solicitation.

(b) If the apparent low bid received in response to this solicitation exceeds the PHA's/IHA's available funding for the proposed contract work, the PHA/IHA may either accept separately priced items (see 8(e) below) or use the following procedure to determine contract award. The PHA/IHA shall apply in turn to each bid (proceeding in order from the apparent low bid to the high bid) each of the separately priced bid deductible items, if any, in their priority order set forth in this solicitation. If upon the application of the first deductible item to all initial bids, a new low bid is within the PHA's/IHA's available funding, then award shall be made to that bidder. If no bid is within the available funding amount, then the PHA/IHA shall apply the second deductible item. The PHA/IHA shall continue this process until an evaluated low bid, if any, is within the PHA's/IHA's available funding. If upon the application of all deductibles, no bid is within the PHA's/IHA's available funding, or if the solicitation does not request separately priced deductibles, the PHA/IHA shall follow its written policy and procedures in making any award under this solicitation.

(c) In the case of tie low bids, award shall be made in accordance with the PHA's/IHA's written policy and procedures.

(d) The PHA/IHA may reject any and all bids, accept other than the lowest bid (e.g., the apparent low bid is unreasonably low), and waive informalities or minor irregularities in bids received, in accordance with the PHA's/IHA's written policy and procedures.

(e) Unless precluded elsewhere in the solicitation, the PHA/IHA may accept any item or combination of items bid.

(f) The PHA/IHA may reject any bid as nonresponsive if it is materially unbalanced as to the prices for the various items of work to be performed. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated for other work.

(g) A written award shall be furnished to the successful bidder within the period for acceptance specified in the bid and shall result in a binding contract without further action by either party.

9. Bid Guarantee (applicable to construction and equipment contracts exceeding \$25,000)

All bids must be accompanied by a negotiable bid guarantee which shall not be less than five percent (5%) of the amount of the bid. The bid guarantee may be a certified check, bank draft, U.S. Government Bonds at par value, or a bid bond secured by a surety company acceptable to the U.S. Government and authorized to do business in the state where the work is to be performed. In the case where the work under the contract will be performed on an Indian reservation area, the bid guarantee may also be an irrevocable Letter of Credit (see provision 10, Assurance of Completion, below). Certified checks and bank drafts must be made payable to the order of the PHA/IHA. The bid guarantee shall insure the execution of the contract and the furnishing of a method of assurance of completion by the successful bidder as required by the solicitation. Failure to submit a bid guarantee with the bid shall result in the rejection of the bid. Bid guarantees submitted by unsuccessful bidders will be returned as soon as practicable after bid opening.

10. Assurance of Completion

(a) Unless otherwise provided in State law, the successful bidder shall furnish an assurance of completion prior to the execution of any contract under this solicitation. This assurance may be [Contracting Officer check applicable items] —

(1) a performance and payment bond in a penal sum of 100 percent of the contract price; or, as may be required or permitted by State law;

(2) separate performance and payment bonds, each for 50 percent or more of the contract price;

(3) a 20 percent cash escrow;

(4) a 25 percent irrevocable letter of credit; or,

(5) an irrevocable letter of credit for 10 percent of the total contract price with a monitoring and disbursements agreement with the IHA (applicable only to contracts awarded by an IHA under the Indian Housing Program).

(b) Bonds must be obtained from guarantee or surety companies acceptable to the U.S. Government and authorized to do business in the state where the work is to be performed. Individual sureties will not be considered. U.S. Treasury Circular Number 570, published annually in the Federal Register, lists companies approved to act as sureties on bonds securing Government contracts, the maximum underwriting limits on each contract bonded, and the States in which the company is licensed to do business. Use of companies listed in this circular is mandatory. Copies of the circular may be downloaded on the U.S. Department of Treasury website <http://www.fms.treas.gov/c570/index.html>, or ordered for a minimum fee by contacting the Government Printing Office at (202) 512-2168.

(c) Each bond shall clearly state the rate of premium and the total amount of premium charged. The current power of attorney for the person who signs for the surety company must be attached to the bond. The effective date of the power of attorney shall not precede the date of the bond. The effective date of the bond shall be on or after the execution date of the contract.

(d) Failure by the successful bidder to obtain the required assurance of completion within the time specified, or within such extended period as the PHA/IHA may grant based upon reasons determined adequate by the PHA/IHA, shall render the bidder ineligible for award. The PHA/IHA may then either award the contract to the next lowest responsible bidder or solicit new bids. The PHA/IHA may retain the ineligible bidder's bid guarantee.

11. Preconstruction Conference (applicable to construction contracts)

After award of a contract under this solicitation and prior to the start of work, the successful bidder will be required to attend a preconstruction conference with representatives of the PHA/IHA and its architect/engineer, and other interested parties convened by the PHA/IHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract (e.g., Equal Employment Opportunity, Labor Standards). The PHA/IHA will provide the successful bidder with the date, time, and place of the conference.

12. Indian Preference Requirements (applicable only if this solicitation is for a contract to be performed on a project for an Indian Housing Authority)

(a) HUD has determined that the contract awarded under this solicitation is subject to the requirements of section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e(b)). Section 7(b) requires that any contract or subcontract entered into for the benefit of Indians shall require that, to the greatest extent feasible

(1) Preferences and opportunities for training and employment (other than core crew positions; see paragraph (h) below) in connection with the administration of such contracts or subcontracts be given to qualified "Indians." The Act defines "Indians" to mean persons who are members of an Indian tribe and defines "Indian tribe" to mean any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians; and,

(2) Preference in the award of contracts or subcontracts in connection with the administration of contracts be given to Indian organizations and to Indian-owned economic enterprises, as defined in section 3 of the Indian Financing Act of 1974 (25 U.S.C. 1452). That Act defines "economic enterprise" to mean any Indian-owned commercial, industrial, or business activity established or organized for the purpose of profit, except that the Indian ownership must constitute not less than 51 percent of the enterprise; "Indian organization" to mean the governing body of any Indian tribe or entity established or recognized by such governing body; "Indian" to mean any person who is a member of any tribe, band, group, pueblo, or community which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs and any "Native" as defined in the Alaska Native Claims Settlement Act; and Indian "tribe" to mean any Indian tribe, band, group, pueblo, or community including Native villages and Native groups (including

corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs.

(b) (1) The successful Contractor under this solicitation shall comply with the requirements of this provision in awarding all subcontracts under the contract and in providing training and employment opportunities.

(2) A finding by the IHA that the contractor, either (i) awarded a subcontract without using the procedure required by the IHA, (ii) falsely represented that subcontracts would be awarded to Indian enterprises or organizations; or, (iii) failed to comply with the contractor's employment and training preference bid statement shall be grounds for termination of the contract or for the assessment of penalties or other remedies.

(c) If specified elsewhere in this solicitation, the IHA may restrict the solicitation to qualified Indian-owned enterprises and Indian organizations. If two or more (or a greater number as specified elsewhere in the solicitation) qualified Indian-owned enterprises or organizations submit responsive bids, award shall be made to the qualified enterprise or organization with the lowest responsive bid. If fewer than the minimum required number of qualified Indian-owned enterprises or organizations submit responsive bids, the IHA shall reject all bids and readvertise the solicitation in accordance with paragraph (d) below.

(d) If the IHA prefers not to restrict the solicitation as described in paragraph (c) above, or if after having restricted a solicitation an insufficient number of qualified Indian enterprises or organizations submit bids, the IHA may advertise for bids from non-Indian as well as Indian-owned enterprises and Indian organizations. Award shall be made to the qualified Indian enterprise or organization with the lowest responsive bid if that bid is -

(1) Within the maximum HUD-approved budget amount established for the specific project or activity for which bids are being solicited; and

(2) No more than the percentage specified in 24 CFR 905.175(c) higher than the total bid price of the lowest responsive bid from any qualified bidder. If no responsive bid by a qualified Indian-owned economic enterprise or organization is within the stated range of the total bid price of the lowest responsive bid from any qualified enterprise, award shall be made to the bidder with the lowest bid.

(e) Bidders seeking to qualify for preference in contracting or subcontracting shall submit proof of Indian ownership with their bids. Proof of Indian ownership shall include but not be limited to:

(1) Certification by a tribe or other evidence that the bidder is an Indian. The IHA shall accept the certification of a tribe that an individual is a member.

(2) Evidence such as stock ownership, structure, management, control, financing and salary or profit sharing arrangements of the enterprise.

(f) (1) All bidders must submit with their bids a statement describing how they will provide Indian preference in the award of subcontracts. The specific requirements of that statement and the factors to be used by the IHA in determining the statement's adequacy are included as an attachment to this solicitation. Any bid that fails to include the required statement shall be rejected as nonresponsive. The IHA may require that comparable statements be provided by subcontractors to the successful Contractor, and may require the Contractor to reject any bid or proposal by a subcontractor that fails to include the statement.

(2) Bidders and prospective subcontractors shall submit a certification (supported by credible evidence) to the IHA in any instance where the bidder or subcontractor believes it is infeasible to provide Indian preference in subcontracting. The acceptance or rejection by the IHA of the certification shall be final. Rejection shall disqualify the bid from further consideration.

(g) All bidders must submit with their bids a statement detailing their employment and training opportunities and their plans to provide preference to Indians in implementing the contract; and the number or percentage of Indians anticipated to be employed and trained. Comparable statements from all proposed subcontractors must be submitted. The criteria to be used by the IHA in determining the statement(s)'s adequacy are included as an attachment to this solicitation. Any bid that fails to include the required statement(s), or that includes a statement that does not meet minimum standards required by the IHA shall be rejected as nonresponsive.

(h) Core crew employees. A core crew employee is an individual who is a bona fide employee of the contractor at the time the bid is submitted; or an individual who was not employed by the bidder at the time the bid was submitted, but who is regularly employed by the bidder in a supervisory or other key skilled position when work is available. Bidders shall submit with their bids a list of all core crew employees.

(i) Preference in contracting, subcontracting, employment, and training shall apply not only on-site, on the reservation, or within the IHA's jurisdiction, but also to contracts with firms that operate outside these areas (e.g., employment in modular or manufactured housing construction facilities).

(j) Bidders should contact the IHA to determine if any additional local preference requirements are applicable to this solicitation.

(k) The IHA [] does [] does not [Contracting Officer check applicable box] maintain lists of Indian-owned economic enterprises and Indian organizations by specialty (e.g., plumbing, electrical, foundations), which are available to bidders to assist them in meeting their responsibility to provide preference in connection with the administration of contracts and subcontracts.

General Conditions for Construction Contracts - Public Housing Programs

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing
OMB Approval No. 2577-0157 (exp. 3/31/2020)

Applicability. This form is applicable to any construction/development contract greater than \$150,000.

This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 2 CFR 200, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135. The form is required for construction contracts awarded by Public Housing Agencies (PHAs).

The form is used by Housing Authorities in solicitations to provide necessary contract clauses. If the form were not used, HAs would be unable to enforce their contracts.

Public reporting burden for this collection of information is estimated to average 1.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Responses to the collection of information are required to obtain a benefit or to retain a benefit.

The information requested does not lend itself to confidentiality.

HUD may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB number.

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1. Definitions

- (a) "Architect" means the person or other entity engaged by the PHA to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When a PHA uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.
 - (b) "Contract" means the contract entered into between the PHA and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor, any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.
 - (c) "Contracting Officer" means the person delegated the authority by the PHA to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the PHA in all dealings with the Contractor.
 - (d) "Contractor" means the person or other entity entering into the contract with the PHA to perform all of the work required under the contract.
 - (e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.
 - (f) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Contract (ACC), to provide financial assistance to the PHA, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to the PHA for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.
 - (g) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.
 - (h) "PHA" means the Public Housing Agency organized under applicable state laws which is a party to this contract.
 - (j) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.
 - (l) "Work" means materials, workmanship, and manufacture and fabrication of components.
- (a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the PHA pursuant to the clause entitled Availability and Use of Utility Services herein.
 - (b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least [] (12 percent unless otherwise indicated) of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the PHA.
 - (c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.
 - (d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save the PHA, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.
 - (e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.
 - (f) The Contractor shall confine all operations (including storage of materials) on PHA premises to areas authorized or approved by the Contracting Officer.
 - (g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the PHA and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.
 - (h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

3. Architect's Duties, Responsibilities, and Authority

- (a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.

2. Contractor's Responsibility for Work

- (b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.
- (c) The Architect's duties and responsibilities may include but shall not be limited to:
- (1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to the PHA which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;
 - (2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;
 - (3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,
 - (4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

4. Other Contracts

The PHA may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with PHA employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by PHA employees

Construction Requirements

5. Pre-construction Conference and Notice to Proceed

- (a) Within ten calendar days of contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of the PHA, its Architect, and other interested parties convened by the PHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The PHA will provide the Contractor with the date, time, and place of the conference.
- (b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice.

6. Construction Progress Schedule

- (a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring labor, materials, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments or take other remedies under the contract until the Contractor submits the required schedule.
- (b) The Contractor shall enter the actual progress on the chart as required by the Contracting Officer, and immediately deliver three copies of the annotated schedule to the Contracting Officer. If the Contracting Officer determines, upon the basis of inspection conducted pursuant to the clause entitled Inspection and Acceptance of Construction, herein that the Contractor is not meeting the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the PHA. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.
- (c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the Default clause of this contract.

7. Site Investigation and Conditions Affecting the Work

- (a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is

reasonably ascertainable from an inspection of the site, including all exploratory work done by the PHA, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the PHA.

- (b) The PHA assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the PHA. Nor does the PHA assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

8. Differing Site Conditions

- (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.
- (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to the PHA within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.
- (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.
- (d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

9. Specifications and Drawings for Construction

- (a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be

promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

- (b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", or "the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by", or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.
- (c) Where "as shown" "as indicated", "as detailed", or of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place" that is "furnished and installed".
- (d) "Shop drawings" means drawings, submitted to the PHA by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The PHA may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.
- (e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the PHA's reasons therefore. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.
- (f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.
- (g) It shall be the responsibility of the Contractor to make timely requests of the PHA for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which shall be

required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

- (h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the PHA and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.
- (i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

10. As-Built Drawings

- (a) "As-built drawings," as used in this clause, means drawings submitted by the Contractor or subcontractor at any tier to show the construction of a particular structure or work as actually completed under the contract. "As-built drawings" shall be synonymous with "Record drawings."
- (b) As required by the Contracting Officer, the Contractor shall provide the Contracting Officer accurate information to be used in the preparation of permanent as-built drawings. For this purpose, the Contractor shall record on one set of contract drawings all changes from the installations originally indicated, and record final locations of underground lines by depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks.
- (c) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all as-built drawings prepared by subcontractors are submitted to the Contracting Officer.

11. Material and Workmanship

- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.
- (b) Approval of equipment and materials.
 - (1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the

machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

- (2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.
- (3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.
- (4) Approval of a sample shall not constitute a waiver of the PHA right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.
- (5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.
- (6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.
- (c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35.

12. Permits and Codes

- (a) The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any

waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

- (b) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where the PHA can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

13. Health, Safety, and Accident Prevention

(a) In performing this contract, the Contractor shall:

- (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
- (2) Protect the lives, health, and safety of other persons;
- (3) Prevent damage to property, materials, supplies, and equipment; and,
- (4) Avoid work interruptions.

(b) For these purposes, the Contractor shall:

- (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and
- (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.

(c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.

(d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.

(e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as the PHA, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

14. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the PHA in the condition and at the time required by the specifications.

15. Availability and Use of Utility Services

- (a) The PHA shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the PHA or, where the utility is produced by the PHA, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.
- (b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the PHA, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

16. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

- (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.
- (b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.
- (e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced in the same condition as at the time of award of this contract.

- (f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
- (g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
- (h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
- (i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
- (j) The Contractor shall indemnify and save harmless the PHA from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which the PHA may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
- (k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

17. Temporary Buildings and Transportation of Materials

- (a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the PHA. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

18. Clean Air and Water

The contractor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

19. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

20. Inspection and Acceptance of Construction

- (a) Definitions. As used in this clause -
 - (1) "Acceptance" means the act of an authorized representative of the PHA by which the PHA approves and assumes ownership of the work performed under this contract. Acceptance may be partial or complete.
 - (2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
 - (3) "Testing" means that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
- (b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to PHA inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
- (c) PHA inspections and tests are for the sole benefit of the PHA and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of the PHA after acceptance of the completed work under paragraph (j) below.
- (d) The presence or absence of the PHA inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
- (e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The PHA may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The PHA shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

- (f) The PHA may conduct routine inspections of the construction site on a daily basis.
- (g) The Contractor shall, without charge, replace or correct work found by the PHA not to conform to contract requirements, unless the PHA decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.
- (h) If the Contractor does not promptly replace or correct rejected work, the PHA may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.
- (i) If any work requiring inspection is covered up without approval of the PHA, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, the PHA considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.
- (j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, the PHA will promptly arrange for the inspection. Unless otherwise specified in the contract, the PHA shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the PHA's right under any warranty or guarantee.

21. Use and Possession Prior to Completion

- (a) The PHA shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the PHA intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The PHA's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the PHA has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the PHA's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas

occupied without proper remuneration therefore. If prior possession or use by the PHA delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

22. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

23. Warranty of Construction

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of 2 years (one year unless otherwise indicated) from the date of final acceptance of the work. If the PHA takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the PHA takes possession.
- (b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to PHA-owned or controlled real or personal property when the damage is the result of—
 - (1) The Contractor's failure to conform to contract requirements; or
 - (2) Any defects of equipment, material, workmanship or design furnished by the Contractor.
- (c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.
- (d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.
- (e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the PHA shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:
 - (1) Obtain all warranties that would be given in normal commercial practice;
 - (2) Require all warranties to be executed in writing, for the benefit of the PHA; and,
 - (3) Enforce all warranties for the benefit of the PHA.
- (g) In the event the Contractor's warranty under paragraph (a) of this clause has expired, the PHA may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

- (h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the PHA nor for the repair of any damage that results from any defect in PHA furnished material or design.
- (i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
- (j) This warranty shall not limit the PHA's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

24. Prohibition Against Liens

The Contractor is prohibited from placing a lien on the PHA's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

Administrative Requirements

25. Contract Period

this contract within _____ calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

26. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

27. Payments

- (a) The PHA shall pay the Contractor the price as provided in this contract.
- (b) The PHA shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. The PHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
- (c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a

basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to HUD. If the contract covers more than one project, the Contractor shall furnish a separate breakdown for each. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.

- (d) The Contractor shall submit, on forms provided by the PHA, periodic estimates showing the value of the work performed during each period based upon the approved submitted not later than 30 days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.
- (e) Along with each request for progress payments and the required estimates, the Contractor shall furnish the following certification, or payment shall not be made: I hereby certify, to the best of my knowledge and belief, that:
 - (1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
 - (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements; and,
 - (3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

Name:

Title:

Date:

- (f) Except as otherwise provided in State law, the PHA shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, the PHA may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, the PHA shall reinstate the ten (10) percent (or other percentage as provided in State law) retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.
- (g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments.

Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the PHA's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the PHA.

- (h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the PHA, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of the PHA to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of the PHA in the course of their employment, the Contractor shall restore such damaged work without cost to the PHA and to seek redress for its damage only from those who directly caused it.
- (i) The PHA shall make the final payment due the Contractor under this contract after (1) completion and final acceptance of all work; and (2) presentation of release of all claims against the PHA arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.
- (j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.
- (k) The PHA shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of the PHA to withhold moneys from the Contractor shall in no wise impair the obligations of any surety or sureties under any bonds furnished under this contract.

28. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or

responsibilities of the parties (e.g., change in the PHA address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.

- (c) When a proposed modification requires the approval of HUD prior to its issuance (e.g., a change order that exceeds the PHA's approved threshold), such modification shall not be effective until the required approval is received by the PHA.

29. Changes

- (a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
 - (1) In the specifications (including drawings and designs);
 - (2) In the method or manner of performance of the work;
 - (3) PHA-furnished facilities, equipment, materials, services, or site; or,
 - (4) Directing the acceleration in the performance of the work.
- (b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral orders) before the Contractor gives written notice as required. In the case of defective specifications for which the PHA is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.
- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.
- (f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:

- (1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.
- (2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.
- (3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change. The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net-change in direct costs for the Contractor or subcontractor performing the work.
- (g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.
- (h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.
- (i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.
- (j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

30. Suspension of Work

- (a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the PHA.
- (b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have

been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

- (c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

31. Disputes

- (a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the PHA against the Contractor shall be subject to a written decision by the Contracting Officer.
- (d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.
- (e) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the PHA in accordance with the PHA's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.
- (f) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

32. Default

- (a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to

proceed with the work (or separable part of the work) that has been delayed. In this event, the PHA may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the PHA resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the PHA in completing the work.

- (b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—
- (1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of the PHA or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with the PHA, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and
 - (2) The Contractor, within days (10 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract.
- (c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of the PHA.

33. Liquidated Damages

- (a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the PHA as liquidated damages, the sum of \$ _____ [Contracting Officer insert amount] for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the PHA. The Contractor remains liable for damages caused other than by delay.
- (b) If the PHA terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final

completion of the work together with any increased costs occasioned the PHA in completing the work.

- (c) If the PHA does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

34. Termination for Convenience

- (a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the PHA. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.
- (b) If the performance of the work is terminated, either in whole or in part, the PHA shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the PHA of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by the PHA to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until the PHA or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to the PHA; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.
- (c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise indicated) of receipt of the Contractor's claim.
- (d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

35. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from the PHA under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

36. Insurance

- (a) Before commencing work, the Contractor and each subcontractor shall furnish the PHA with certificates of insurance showing the following insurance is in force and will insure all operations under the Contract:
- (1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.
 - (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than \$ 2MM [Contracting Officer insert amount]

per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.

- (3) Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$ 500K [Contracting Officer insert amount] per occurrence.
- (b) Before commencing work, the Contractor shall furnish the PHA with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor and the PHA as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by the PHA shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by the PHA. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by the PHA. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the PHA. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the PHA's existing fire and extended coverage policy can be endorsed to include such work.
- (c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

37. Subcontracts

- (a) Definitions. As used in this contract -
- (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.

- (2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.
- (b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.
- (c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Contractor.
- (d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.
- (e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and the PHA or between the subcontractor and HUD.

38. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

- (a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;
- (c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and
- (e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

39. Equal Employment Opportunity

During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.
- (b) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or handicap. Such action shall include, but not be limited to, (1) employment, (2) upgrading, (3) demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training, including apprenticeship.

- (c) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.
- (d) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or handicap.
- (e) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
- (f) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
- (g) The Contractor shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor shall permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (h) In the event of a determination that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts, or Federally assisted construction contracts under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.
- (i) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.
- (j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.
- 40. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.**
- (a) The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.
- (c) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- (d) The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (e) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (f) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (g) With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

41. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

42. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of the PHA, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the PHA was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

43. Limitations on Payments made to Influence Certain Federal Financial Transactions

- (a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

44. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the PHA harmless from loss on account thereof; except that the PHA shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

45. Examination and Retention of Contractor's Records

- (a) The PHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.
- (b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.
- (c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the PHA, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

46. Labor Standards - Davis-Bacon and Related Acts

If the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

- (a) Minimum Wages.
 - (1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall

be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.
- (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the

amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

- (b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.
- (c) Payrolls and basic records.
- (1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (2) (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)
- (ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;
- (B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
- (C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.
- (iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.
- (3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to

make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under

the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
- (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
- (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
- (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the PHA, HUD, the U.S. Department of Labor, or the employees or their representatives.
- (i) Certification of eligibility.
 - (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

- (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
- (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
 - (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
- (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

47. Non-Federal Prevailing Wage Rates

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
 - (1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL-recognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

48. Procurement of Recovered Materials.

- (a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The Contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
- (b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of \$10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was with a Federal agency or a State agency or agency of a political subdivision of a State; and (ii) purchased a total of in excess of \$10,000 of the item both under and outside that contract.

CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

FORM CIQ

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

OFFICE USE ONLY

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

2 **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information is being disclosed.

Name of Officer

4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

Yes No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

Yes No

5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6 Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

(a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed;
- or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:

- (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
- (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:

- (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
- (B) that the vendor has given one or more gifts described by Subsection (a); or
- (C) of a family relationship with a local government officer.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

OFFICE USE ONLY

Complete Nos. 1 - 4 and 6 if there are interested parties.
 Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the goods or services to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is NO Interested Party.

6 AFFIDAVIT I swear, or affirm, under penalty of perjury, that the above disclosure is true and correct.

 Signature of authorized agent of contracting business entity

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said _____, this the _____ day of _____, 20 _____, to certify which, witness my hand and seal of office.

 Signature of officer administering oath Printed name of officer administering oath Title of officer administering oath

ADD ADDITIONAL PAGES AS NECESSARY

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

0348-0046

(See reverse for public burden disclosure.)

1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. Report Type: <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, <i>if known</i> : Congressional District, if known:	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known:	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, <i>if applicable</i> : _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$ _____	
10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i>	b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i>	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Federal Use Only:		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Certification of Payments to Influence Federal Transactions

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157 (Exp. 01/31/2017)

Applicant Name

Program/Activity Receiving Federal Grant Funding

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, Disclosure Form to Report Lobbying, in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

I hereby certify that all the information stated herein, as well as any information provided in the accompaniment herewith, is true and accurate.

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

Name of Authorized Official

Title

Signature

Date (mm/dd/yyyy)

ATTACHMENT C
Profile of Firm Form
Company Biography

PROFILE OF FIRM FORM (Page 1 of 2)

(1) Prime ___ Joint Venture/Partner ___ Sub-contractor ___ (This form shall be completed by and for each).

(2) Legal Name of Firm: _____ Telephone: _____ Fax: _____
 dba if applicable: _____

(3) Street Address, City, State, Zip: _____

(4) Identify Principals/Partners in Firm

NAME	TITLE	% OF OWNERSHIP

(5) Please indicate the operating structure of your company.

Publicly Held Corporation
 Privately Held Corporation
 Government Agency
 Non-Profit Organization
 Partnership
 Sole Proprietorship

(6) Bidder's Diversity Statement: You must check all of the following that apply to the ownership of this firm and enter where provided the correct percentage (%) of ownership of each:

{Minority (MBE), or Woman-Owned (WBE) Business Enterprises qualify by virtue of 51% or more ownership and active management in the firm.}

African American _____%
 Native American _____%
 Hispanic American _____%
 Asian/Pacific American _____%
 Hasidic Jew _____%
 Asian/Indian American _____%

Woman-Owned (MBE) _____%
 Woman-Owned (Caucasian) _____%
 Disabled Veteran _____%
 Caucasian American (Male) _____%
 Other (Specify): _____%

(7) Is the business 51% or more owned by a public housing resident? ___ Yes ___ No. If yes, provide name and address of the public housing facility:

Facility Name: _____

Facility Address: _____ City: _____

SWMBE Certification Number: _____

Certification Agency: _____

(NOTE: A CERTIFICATION/NUMBER IS NOT REQUIRED – ENTER IF AVAILABLE)

(8) Federal Tax ID Number: _____

(9) City of San Antonio Business License No.: _____

(10) State of Texas License Type and No.: _____

PROFILE OF FIRM FORM (Page 2 of 2)

(11) Has your firm or any member of your firm been a party to litigation with a public entity? If yes, when, with whom and state the circumstances and any resolution.

(12) Has your firm or any member of your firm ever sued or been sued by the San Antonio Housing Authority or its affiliated entities? If yes, when and state the circumstances and any resolution of the lawsuit.

(13) Has your firm or any member of your firm ever had a claim brought against because of breach of contract or nonperformance? If yes, when and state the circumstances and any resolution of the matter.

(14) Debarred Statement: Has this firm, or any principal(s) ever been debarred from providing any services by the Federal Government, any state government, the State of Texas, or any local government agency within or without the State of Texas? Yes No

Initials _____

If "Yes," please attach a full detailed explanation, including dates, circumstances and current status.

(15) Disclosure Statement: Does this firm or any principals thereof have any current, past personal or professional relationship with any Commissioner or Officer of SAHA? Yes No

Initials _____

If "Yes," please attach a full detailed explanation, including dates, circumstances and current status.

(16) Verification Statement: The undersigned Offerer hereby states that by completing and submitting this form he/she is verifying that all information provided herein is, to the best of his/her knowledge, true and accurate, and agrees that if the SAHA discovers that any information entered herein is false, that shall entitle the SAHA to not consider nor make award or to cancel any award with the undersigned party.

Initials _____

(18) In performing this contract, the contractor(s) shall comply with any and all applicable federal, state or local laws including but not limited to: Occupational Safety & Health, Equal Employment Opportunity, Immigration and Naturalization, The Americans with Disabilities Act, State Tax and Insurance Law, and the Fair Housing Act.

Initials _____

Signature

Date

Printed Name

Company

Company Biography

Company Name: _____

Headquarters Location: _____

Field Office Locations: _____

Business Specialty or Focus: _____

Number of Full Time Staff: _____

Founding Date and Brief History: _____

Texas Projects and/or Clients: _____

(past & current)

Previous Housing Authority Experience: YES NO

List the Authorities: _____

Proposed Subcontractors

Note: A completed Profile of Firm Form must be submitted for each subcontractor.

Proposed Subcontractors					
Item	Company Name	Address	Phone	Specialty	S/W/M/V BE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

<p>I understand and agree that if awarded a contract as a result of this solicitation that the use of the above subcontractors is subject to the approval of SAHA and becomes a part of the contract. I further understand that any change in subcontractors also requires the pre-approval of SAHA.</p>	<p>_____</p> <p>(Signature)</p> <p>_____</p> <p>(Printed Name & Title)</p> <p>_____</p> <p>(Company Name)</p>
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ATTACHMENT D

Section 3 Guidelines and Forms

SAN ANTONIO HOUSING AUTHORITY

SECTION 3 PROGRAM

CONTRACTOR COMPLIANCE GUIDE

BACKGROUND

The San Antonio Housing Authority (SAHA) adopted a formal Section 3 program, policy, and procedures on June 2, 2011 (Resolution 5164) to provide the framework for its compliance with Section 3 of the Housing and Urban Development (HUD) Act of 1968 which applies to all employment and economic projects funded in whole or in part by HUD.

Therefore, all prime contractors participating on a HUD-assisted project shall comply with all applicable sections of the SAHA Section 3 Program.

The objective of the SAHA Section 3 Program is to ensure to the greatest extent feasible that employment and other economic-related opportunities are directed to low- and very-low income individuals and businesses owned by such individuals.

SECTION 3 GUIDANCE

1. The SAHA Section 3 Program adopted on June 2, 2011 is hereby incorporated by reference as part of this Interim Section 3 Guidance. Notice is hereby given that it is the responsibility of bidder/proposer or contractor to ensure understanding and compliance with all applicable sections of the Section 3 Program. Bidders/proposers and/or prime contractors are directed to the SAHA website for more information on the Section 3 Program.
2. The Section 3 Program requirements apply to all HUD-assisted projects covered by Section 3 and are therefore applicable to SAHA bidders/proposers and recipients of contracts and subcontracts.
3. In order to achieve the Section 3 Program objectives, numerical goals for training/employment and subcontracting opportunities for Section 3 residents and Business Concerns have been established. The Section 3 goals (below) apply to the entire Section 3 covered project and represent minimum numerical goals set forth in the Section 3 Program. In the absence of evidence to the contrary, a contractor that meets the minimum numerical goals will be considered to have complied with the Section 3 Program requirements. SAHA reserves the right to increase project-specific goals as may be deemed appropriate by the SAHA representatives. Contractors are advised to read each solicitation carefully to determine the applicable goals for compliance. In the event the solicitation changes the goals listed below, Contractor must follow the stricter goals.

Employment: Thirty percent (30%) of new hires per contract should be Section 3 residents.

Contracting: Subcontract ten percent (10%) of the total value of a construction contract with Section 3 Business Concerns.

Professional Services: Subcontract three percent (3%) with Section 3 Business Concerns on non-construction contracts (professional services).

3. In order to ensure the greatest impact on employment, contracting and economic opportunities, SAHA contractors and subcontractors shall direct their efforts to Section 3 residents and Business Concerns on a “preference” tiered basis as follows:

Training/Employment

- a) Category 1: Residents of the housing development or developments for which the Section 3 covered assistance is expended.
- b) Category 2: Residents of the other housing developments managed by the housing authority that is expending the Section 3 covered assistance.
- c) Category 3: Participants in HUD Youthbuild programs being carried out in the metropolitan area in which the Section 3 covered assistance is expended.
- d) Other Section 3 residents.

Contracting Opportunities

- a) Category 1: Business Concerns that are 51 percent or more owned by residents of the housing development or developments for which the Section 3 covered assistance is expended, or whose full-time permanent workforce includes 30 percent of those persons as employees.
- b) Category 2: Business Concerns that are 51 percent or more owned by residents of other housing developments or developments managed by the housing authority that is expending the Section 3 covered assistance, or whose full-time permanent workforce includes 30 percent of those persons as employees.
- c) Category 3: HUD Youthbuild programs being carried out in the metropolitan area (or non-metropolitan county) in which the Section 3 covered assistance is expended.
- d) Category 4: Business concerns that are 51 percent or more owned by Section 3 residents or whose permanent, full-time workforce includes no less than 30 percent Section 3 residents, or that subcontract in excess of 25 percent of the total amount of subcontracts to Category 1 or 2 business concerns identified above.

4. To more effectively apply the Section 3 preferences, the following incentives shall be applicable to Section 3 HUD-assisted projects:

Solicitations Under \$50,000

On solicitations under \$50,000 and where two or more certified Section 3 Business Concerns are available to compete, SAHA will institute a “first source” solicitation initiative whereby two of the three solicited firms must be Section 3 Business Concerns.

Solicitations Greater than \$50,000

On Requests for Proposals the following incentives will be instituted:

- 1) A twenty percent (20%) preference will be instituted for Category 1 Section 3 Business Concerns bidding as prime contractors.
- 2) A fifteen percent (15%) preference will be instituted for Category 2 Section 3 Business Concerns bidding as prime contractors.
- 3) A ten percent (10%) preference will be instituted for Category 3 Section 3 Business Concerns bidding as prime contractors.
- 4) A five percent (5%) preference will be instituted for Category 4 Section 3 Business Concerns bidding as prime contractors.
- 5) A five percent (5%) preference will be provided to SAHA prime contractors that have achieved both the resident hires and business concern contracting goals in their immediate past contract performance within the last year.
- 6) A five percent (5%) preference will be provided to SAHA prime contractors participating in a SAHA approved Joint Venture or Mentor-Protégé program with an eligible Section 3 Business Concern.
- 7) A five percent (5%) preference will be provided to prime contractors that have formal apprenticeship programs approved by DOL and commit to training no less than ten (10) eligible Section 3 residents through such programs annually that provide no less than 250 hours of formal training.

On Invitations for Bids the following preference will be instituted:

- 1). Contractors who are certified as Section 3 Business Concerns and whose prices are within the independent cost estimate of the project and are both responsive and responsible, shall receive a preference according to the following table, where x is the amount by which the Section 3 Business Concern may be above the lowest responsive bid.

x=lesser of:
<p>When the lowest responsive bid is less than \$100,000 10% of that bid or \$9,000.</p>
<p>When the lowest responsive bid is:</p> <p>At least \$100,000, but less than \$200,000 9% of that bid, or \$16,000.</p> <p>At least \$200,000, but less than \$300,000 8% of that bid, or \$21,000.</p> <p>At least \$300,000, but less than \$400,000 7% of that bid, or \$24,000.</p>

At least \$400,000, but less than \$500,000 6% of that bid, or \$25,000.
At least \$500,000, but less than \$1 million 5% of that bid, or \$40,000.
At least \$1 million, but less than \$2 million 4% of that bid, or \$60,000.
At least \$2 million, but less than \$4 million 3% of that bid, or \$80,000.
At least \$4 million, but less than \$7 million 2% of that bid, or \$105,000.
\$7 million or more 1½% of the lowest responsive bid, with no dollar limit.

2) Where two or more Section 3 business concerns are both responsive and responsible, the Section 3 business concern with the lowest price shall receive the contract award.

A successful contractor's usage of the above preferences shall be capped annually at \$1 million dollars in the aggregate. Once a contractor has been awarded annually \$1 million dollars in contracts as a result of a preference, the contractor is no longer eligible for the above preferences for the remainder of the calendar year.

5. Bidders/proposers must either achieve the Section 3 Program employment and subcontracting goals identified above (under number 3) or demonstrate acceptable good faith efforts to achieve the numerical goals in the proposal/bid. SAHA representatives shall review and deem acceptable, in their sole determination, a bidder or proposer's good faith efforts prior to the award of the contract. Please be advised that a contractor Section 3 performance will be considered and evaluated on future SAHA contracts and will be a factor in the selection and/or contract award.
6. To ensure that the SAHA Section 3 Program benefits individuals and businesses that are eligible Section 3 residents and Business Concerns, all Section 3 resident and Business Concerns must be deemed eligible through documentation of a "Section 3 Eligibility Form" for each eligible individual or business. Notice is hereby given that it is the responsibility of the prime contractor to ensure that all participating and eligible Section 3 residents and/or Business Concerns (vendors, suppliers or subcontractors) submit the necessary information for proper SAHA status review and credit.
7. All SAHA prime contractors must submit a Section 3 program compliance report on a monthly basis in the form and content as requested by SAHA staff. This report shall document Section 3 resident and Business Concern training, employment, and subcontracting monthly performance against goals and opportunities.
8. Failure or refusal by a SAHA bidder/proposer or contractor to satisfy or comply with the Section 3 Program requirements, either during the bid/proposal process or during the term of the SAHA agreement, shall constitute a material breach of contract whereupon the contract, at the option of SAHA, may be cancelled, terminated, or suspended in whole or in part; and, the contractor debarred from further contracts with SAHA as a non-responsible contractor. SAHA may at its discretion also declare bids/proposals not complying with the Section 3 Program requirements in whole or in part nonresponsive and eliminate them from consideration of a contract award.

INTERIM PRIME CONTRACTOR COMPLIANCE REQUIREMENTS

Prime contractors participating on SAHA Section 3 HUD-assisted projects are specifically required to address and satisfy the Section 3 Program requirements described below *prior* to the award of the contract. The Section 3 Program requirements shall be applicable throughout the duration of the contract and to any amendment and renewal.

1. In the absence of evidence to the contrary, a prime contractor that meets the minimum Section 3 Program numerical goals set forth in the solicitation will be considered to have complied with the Section 3 Program requirements. A prime contractor who meets this goal must submit with the bid/proposal a “*Good Faith Effort Compliance Plan*” (**Attachment A**) by simply completing Sections A and B which present the project and contractor information and goal commitment information respectfully.
2. In evaluating compliance, a prime contractor that *has not* met the numerical goals set forth in the solicitation has the burden of fully demonstrating its efforts to achieve the Section 3 goals through the submittal and approval of a “*Good Faith Effort Compliance Plan*” (**Attachment A**) to include completion of Sections A, B and C which must be included with the bid/proposal. SAHA representatives shall review and determine in their sole discretion whether a bidder or proposer’s (contractor) good faith effort compliance plan achieves the Section 3 Program goals and objectives. A responsive good faith effort compliance plan shall address all questions in Sections A, B and C and describe the concrete efforts that were taken and will be taken to reach numerical goals in hiring/employment, training, and contracting. The final agreed-upon plan shall become part of the SAHA contract.
3. SAHA reserves the right to disregard bids/proposals as non-responsive bids and proposals which fail to demonstrate a good faith effort towards compliance with the Section 3 Program requirements.
4. As required under the Section 3 Program’s contractual clause, prime contractors specifically agree to include the Section 3 Clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agree to take appropriate action, as provided in an applicable provision of the subcontract or in the Section 3 Clause, upon a finding that a subcontractor is in violation of the regulations in 24 CFR Part 135. A prime contractor shall not subcontract with any subcontractor where the bidder/proposer has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
5. Prime contractors shall submit a properly completed and executed “Section 3 Eligibility Form” for all participating Section 3 residents and/or Section 3 Business Concerns (**Attachment B**). It is the responsibility of the prime contractor to ensure that eligible Section 3 residents and Business Concerns submit all necessary information for SAHA review and credit, to include an eligible Section 3 prime contractor, if applicable.

6. Prime contractors requesting a Section 3 Program preference based upon employment or ownership interest shall submit a properly completed and executed Section 3 Eligibility Forms for all employees and owners who qualify, and provide any supporting documentation that may subsequently be required by SAHA. Prime contractors and subcontractors must employ any Section 3 residents full-time for not less than one month prior to the submittal of the bid/proposal in order for the prime contractor to receive credit for employing the Section 3 resident for a preference.
7. Notwithstanding the fact that a prime contractor may have the capability to complete a total project with its own workforce and without the use of subcontractors, all SAHA prime contractors on a HUD-assisted project shall be required to achieve the Section 3 Program numerical goals or demonstrate a good faith effort to achieve those goals within the industry. Should the need arise to hire or subcontract during the term of a contract, the hiring and/or subcontracting goals shall still be applicable and the training component remains in force.
8. All changes to the original list of subcontractors submitted with the bid or proposal shall be submitted for review and approval in accordance with SAHA's procedures when adding, changing, or deleting subcontractors/sub-consultants. Prime contractors are required to make a good faith effort to replace any Section 3 Business Concern with another eligible Section 3 Business Concern. SAHA may deny such requests when it finds that a prime contractor fails to provide acceptable justification or when the effect of such change would dilute a preference received on a HUD-assisted contract.
9. All prime contractors participating on a HUD-assisted project shall submit a Section 3 Performance Report no later than the third business day of the following month detailing Section 3 employment and contracting activity not only for themselves but also all subcontractors on the project. The report is to also detail training and other economic opportunity activities by the prime contractor and subcontractors.

SAN ANTONIO HOUSING AUTHORITY SECTION 3 PROGRAM UTILIZATION PLAN

INSTRUCTION SHEET

Please read these instructions carefully before completing the required *Section 3 Utilization Plan* document. These instructions are designed to assist bidders/proposers document Section 3 Program compliance. or present a detailed explanation why, despite their best efforts the minimum numerical goals were not met. These numerical goals are **minimum** targets that must be reached in order for SAHA to consider a recipient in compliance.

Questions regarding completion of the *Section 3 Utilization Plan* document should be directed to: Section 3 Coordinator, at 210 -477 -6165 or section3@saha.org.

- Bidders/proposers are required to make sincere efforts to achieve the Section 3 Program numerical goals as specified in solicitation documents. A bidders/proposers approved Section 3 Utilization Plan will be monitored throughout the duration of the SAHA contractual term.
- Contractor shall submit a *Section 3 Utilization Plan* at the time of bid/proposal submittal in order to be considered responsive.
- This *Section 3 Utilization Plan* is subject to SAHA's review and approval. SAHA may at its sole discretion approve or disapprove the plan. SAHA's determination is administratively appealable to the CEO and to the Board of Commissioners pursuant to SAHA's Section 3 Program, Policy & Procedures.
- All bidders/proposers are to complete the following:

- _____ **Section A**, Bidder/Proposer Information
- _____ **Section B**, Contractor Commitments - New Hires
- _____ **Section C**, Contractor Commitments - Subcontractors
- _____ **Section D**, Contractor Commitments – Other Economic Opportunities
- _____ **Section E**, Good Faith Efforts
- _____ **Section F**, Section 3 Compliance Certification

Optional:

- _____ Certification for Section 3 Business Concerns
- _____ Section 3 Individual Verification Form (S3-6003b REV 2/2016)

- SAHA requires all Section 3 residents and/or Business Concerns to certify or submit evidence to SAHA, contractor, or subcontractor, that the person or business is Section 3 eligible. SAHA has developed a Certification Process for this purpose. It is the responsibility of the Contractor to submit these forms to the SAHA Section 3 Coordinator at section3@saha.org.

SECTION 3 PROGRAM UTILIZATION PLAN

Project Title: _____

SECTION A – BIDDER/PROPOSER INFORMATION

Name of Firm: _____

Contact Person: _____ Telephone: _____

Email: _____

Is your firm a "Section 3 Business Concern": Yes _____ No _____
 If "Yes"; complete the Certification for Section 3 Business Form and attach the Required Documentation.

SECTION B – CONTRACTOR COMMITMENTS – NEW HIRES (If more space is needed, please provide an attachment).

Hiring Goal: A minimum of Thirty percent (30%) of the aggregate number of new hires shall be Section 3 residents

B.1 Explain how you intend to recruit a minimum of 30% of Section 3 residents for **full-time new hires**, and what actions you will use to require subcontractors to do the same. **Note:** Section 3 individuals must work a minimum of 32 hours per week or 135 hours per month to be considered full-time employees.

B.2 Complete the table below to identify the bidder's/proposer's employee positions required for the execution of this project.

Job Category*	Number of Positions to be Filled with Section 3 Residents	Anticipated wages per hour
Professionals		
Technicians		
Office/Clerical		
Officers/Managers		
Sales		
Craft Workers (Skilled)		
Operatives (Semi-Skilled)		
Laborers (Unskilled)		
Service Workers		
Other List & describe		

B.3 The contractor has committed to employ _____ resident(s) in order to comply with its Section 3 requirements. Indicate the estimated percentage of Section 3 new hires for this project: _____

SECTION C – CONTRACTOR COMMITMENTS – SUBCONTRACTORS (If more space is needed, please provide an attachment).

Contracting Goal: A minimum of ten percent (10%) of all covered **construction** contracts shall be awarded to Section 3 business concerns. Three percent (3%) of all covered **non-construction** contracts shall be awarded to Section 3 business concerns

C.1 Describe how bids from Section 3 businesses will be solicited for subcontracting.

C.2 Complete the table below to identify the subcontractors/suppliers that will be utilized for the execution of this project.

Subcontractor/Supplier Listing

Subcontractor or Supplier/ Name and Address and phone number	Scope of Work/Product	\$ Value	Certified Section 3 Business Concern (Y/N)

(Make Additional Copies as Necessary)

C.3 The Prime Contractor will subcontract with a total of _____ Section 3 Business Concerns totaling _____% of the Contract Value. **NOTE:** *The contractual opportunity goal is a percentage of the total gross dollar value of the proposed contract awarded to a Section 3 eligible Business Concern. SAHA will only credit participation by Section 3 Business Concerns that submit documentation acceptable to SAHA certifying their Section 3 status.*

**SECTION D – CONTRACTOR COMMITMENTS – OTHER ECONOMIC OPPORTUNITIES
(If more space is needed, please provide an attachment).**

B.3 The undersigned bidder/proposer will satisfy the Section 3 *other economic opportunity* goal:
Yes _____ No _____

Please outline your plan to provide other economic opportunities to Section 3 residents. Examples of plans may include training agreements, internship programs, mentorship programs etc.

SECTION E – GOOD FAITH EFFORTS

NOTE: Fill this section only, if Plan as submitted fails to meet the employment and contractual opportunity goals as stated herein or as amended in the solicitation.

D.1 If no contracting, hiring or other economic opportunities are anticipated, briefly explain why.

SECTION F: SECTION 3 UTILIZATION PLAN CERTIFICATION

I CERTIFY THAT I HAVE REVIEWED AND FULLY UNDERSTAND SAHA'S SECTION 3 PROGRAM AND THE SECTION 3 CLAUSE INCORPORATED BY REFERENCE INTO THIS DOCUMENT. I HEREBY AFFIRM THAT THE INFORMATION SUBMITTED HEREIN IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

I HEREBY CERTIFY THAT THE ABOVE TABLES IDENTIFY THE NUMBER OF SECTION 3 BUSINESS CONCERNS THE COMPANY WILL UTILIZE AND THE NUMBER OF SECTION 3 RESIDENTS THE COMPANY PROPOSES TO EMPLOY.

I FURTHER UNDERSTAND AND AGREE THAT, THIS DOCUMENT SHALL BE ATTACHED THERETO AND BECOME A BINDING PART OF THE SAHA CONTRACT.

NAME AND TITLE OF AUTHORIZED OFFICIAL:

SIGNATURE: _____ DATE: _____

San Antonio Housing Authority

Section 3 Individual New Hire Verification Form

NEW HIRES MUST COMPLETE THIS FORM. The Section 3 Program requires that recipients of certain HUD financial assistance, to the greatest extent feasible provide employment, training or education opportunities for low- and very-low income persons in connection with projects and activities in their neighborhood. Completion of this form helps your new employer and SAHA monitor compliance to the Section 3 program and may help in obtaining future business with the Housing Authority. Your information is kept CONFIDENTIAL and will not affect any federal subsidies you currently receive, if any.

CONTACT INFORMATION					
First Name:	Last:	M.I.:	Suffix:		
Residence Address:			City:		
State:	Zip:	County:		Phone:	
Email Address (required):				DOB:	
Date of Hire:		Company Name:			
Job Title:		Type of job:		Full-Time (32+ hours per week)	Part-Time

INCOME DISCLOSURE (CHECK ONE OPTION BELOW)

In order to be eligible as a Section 3 individual, your household income must meet the income criteria by household size. Individuals are eligible for Section 3 status if their household income is at or below 80% of Area Median Income in Bexar County during the current calendar year or be a resident of public housing or Section 8.

Option 1: I choose to disclose this information

Choose the number of individuals in your household in the chart below to determine your HUD income limit. The dollar amount below the number you indicate is your HUD income limit.

FY 2018 80% Area Median Income Limits (by Household Size)

Number of persons in household	1	2	3	4	5	6	7	8
80% of Area Median Income (FY 2018 HUD Income Limits)	\$37,450	\$42,800	\$48,150	\$53,450	\$57,750	\$62,050	\$66,300	\$70,600

YOU MUST ANSWER THE FOLLOWING QUESTIONS IF YOU ARE CLAIMING SECTION 3 ELIGIBILITY:

Is your household income at or below the HUD income limit for the current year? **Yes** **No**

If your answer is YES and you reside in Bexar County, you are a Section 3 individual, regardless of public housing status.

Are you a resident of public housing or Section 8? **Yes** **No**

If your answer is YES, you are a Section 3 individual regardless of your income.

Option 2: I choose NOT to disclose this information OR I do not qualify as a Section 3 eligible individual.

CERTIFICATION

By signing, I authorize my employer to release relevant information to the San Antonio Housing Authority (SAHA) for contract compliance purposes. I further affirm that the information on this form is to the best of my knowledge and belief true, correct, and complete.

Signature _____

DATE: _____

M/WBE UTILIZATION STATEMENT
SAN ANTONIO HOUSING AUTHORITY
M/WBE PROGRAM OFFICE

Please read these instructions carefully before completing the required Minority/Women Business Enterprise (M/WBE) Utilization Statement. These instructions are designed to assist prime contractors/consultants document M/WBE program compliance or in preparing the required detailed and complete good faith effort information.

Contractors/Consultants are required to submit detailed documentation when the contract specified M/WBE participation ranges or goals are not met. The SAHA M/WBE Program Manager will review and consider a bidder's or proposer's good faith efforts in assisting SAHA to meet its M/WBE policy and program objectives.

A. Bidders/Proposers are required to make sincere efforts in attempting to achieve the applicable SAHA M/WBE participation ranges or goals. The approved M/WBE participation ranges or goals will be monitored throughout the duration of the project;

B. All bidders/proposers are to complete Section A, Project Identification and Section B, Project M/WBE Utilization, if applicable. Should there be subcontracting/sub consulting opportunities, yet the bidder/proposer *not* achieve the project's applicable M/WBE participation range or goal, the bidder/proposer must complete all other sections of the Statement.

C. This Statement should be prepared by the company's project M/WBE Coordinator or designee. The Statement must be signed and dated by an authorized company official. The Coordinator or designee should have a working knowledge as to the project's subcontracting or sub-consulting and supplier activities (actual and anticipated). This individual shall be a key figure in directing the prime contractor's M/WBE activities.

D. The M/WBE Utilization Statement demonstrating a contractor's good faith efforts is subject to the SAHA M/WBE Program Coordinator's review and approval.

E. SAHA requires all M/WBE firms to be certified as such by an entity acceptable to SAHA for project M/WBE credit.

F. SAHA reserves the right to approve all additions or deletions of subcontractors, subconsultants, and/or major vendors. In the event that an M/WBE subcontractor, subconsultant, and/or major vendor is replaced, the contractor must make a good faith effort to involve and utilize another M/WBE subcontractor, sub consultant, and/or major vendor.

Should you have any questions or need additional information, please contact:

Charles Bode
818 S Flores
Asst. Director of Procurement
charles_bode@saha.org
210-477-6165

FOR SAHA PROCUREMENT DEPARTMENT USE ONLY

Reviewed by: _____

Date: _____

Signature of SAHA Official: _____

Recommendation: Approval: _____ Denial: _____

subject to the SAHA M/WBE Program Manager's review and approval.

M/WBE UTILIZATION STATEMENT
 SAN ANTONIO HOUSING AUTHORITY
 M/WBE PROGRAM OFFICE

SECTION A: PROJECT IDENTIFICATION

Project Number _____ Project Title _____

Contract Amount _____ Company Name _____

Project Participation Range/Goal: M/WBE ____ %

Contract Anticipated Participation Range: M/WBE ____ %

The M/WBE participation range/goal is expressed as a percentage of the total dollar amount of the prime contract awarded to M/WBEs. The goal is applicable for those areas, which the prime contractor has subcontracted, sub-consulted, and/or major supplies necessary in the performance of the contract.

SECTION B: SUBCONTRACTOR/SUB CONSULTANT/VENDOR UTILIZATION

1. List all actual *and* anticipated subcontracts, subconsultants, and/or major material purchases, include *both* M/WBE and non-M/WBE, to be utilized on the project (*use additional sheets if necessary*).

TRADE AREA	ESTIMATED AMOUNT (\$)	SUB/SUPPLIER	SUB/SUPPLIER	
			M/WBE	Yes (✓) No

2. MBE utilization in total dollars: _____ WBE utilization in total dollars: _____

3. Overall MBE utilization percentage (%): _____

4. Overall WBE utilization percentage (%): _____

5. Overall M/WBE utilization percentage (%): _____

6. Anticipated M/WBE utilization on this contract will occur:

Throughout ___ Beginning 1/3 ___ Middle 1/3 ___ Final 1/3 ___

Please Note: SAHA will credit only those M/WBEs that have been certified by an entity acceptable to SAHA. All changes, additions, or deletions occurring during the life of this contract relative to use of the listed subcontractors, sub-consultants and/or

major suppliers, M/WBE or otherwise, must be submitted to SAHA for review and approval.

If Bidder/Proposer is unable to meet the M/WBE participation range/goal, please proceed to complete Section C and submit documentation demonstrating contractual good faith efforts.

SECTION C: GOOD FAITH EFFORT

The following items are minimally considered as good faith efforts and demonstrate specific initiatives made in attempting to achieve SAHA's M/W/BE participation ranges. The bidder/proposer is not limited to these particular areas and may include other efforts deemed appropriate. Please feel free to elaborate on any question below.

Required Questions	Yes	No
1. If applicable, was your company represented at the pre-bid conference?		
2. Did your company request and obtain a copy of the certified M/WBE firms?		
3. Were M/WBE firms solicited for contract participation?		
4. Provide listing of solicited M/WBEs with whom contact was made? Please identify name of company, contact person, date, phone number and briefly describe nature of solicitation. (Include as an Attachment)		
5. Was direct contact made with SAHA's M/WBE Program Office? If yes, please identify date/person contacted and assistance sought. (Include as an Attachment)		
6. Identify all M/WBE support agencies/associations contacted for M/WBE assistance or solicitation (Minority Chamber's of Commerce, purchasing councils, contractor groups, etc.). (Please attach copies of solicitation letters of assistance and/or describe, as an Attachment to this section, the personal contact made)		
7. Were bid opportunities related to this project advertised in minority/women newspapers and trade journals? (If yes, please include a copy of the advertisement or detail the name of the publication(s), date of advertisement and describe the solicitation)		
8. Were copies of plans and specification furnished to any M/WBEs?		
9. Were subcontractors, subconsultants, and/or suppliers (if applicable) required to provide insurance or be bonded? (If yes, please detail any assistance that was provided or if they were referred, to whom)		
10. List, as an Attachment, all M/WBE bids received but rejected. Identify company name, contact person, telephone number, date, trade area, and the reason for rejecting the bid/proposal.		
11. Discuss any other effort(s) aimed at involving M/WBEs (Include as an Attachment) : (a) Identify any specific efforts to divide work, in accordance with normal industry practices, to allow maximum M/WBE participation.		

(b) Discuss joint ventures initiatives, requesting second-tier M/WBE subcontracting, etc., if any.		
(c) List all other good faith efforts employed, please elaborate.		

The undersigned acknowledges and states that all information submitted as part of this Good Faith Effort Statement is true and correct to the best of his/her knowledge. I further agree that this document shall be attached thereto and become a binding part of the SAHA contract.

Print Name

Title Date

Signature

Telephone Number

ATTACHMENT E

Wage Decision

General Decision Number: TX180021 01/05/2018 TX21
 Superseded General Decision Number: TX20170021

State: Texas

Construction Type: Residential

Counties: Bexar, Comal and Guadalupe Counties in Texas.

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories.)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.35 for calendar year 2018 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.35 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2018. The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/05/2018

* SUTX1983-005 05/01/1983	Rates	Fringes
Air Conditioning Mechanic.....	\$ 7.25	
CARPENTER.....	\$ 7.25	
CEMENT MASON/CONCRETE FINISHER.....	\$ 7.46	
DRYWALL HANGER.....	\$ 8.73	
ELECTRICIAN.....	\$ 9.66	
IRONWORKER.....	\$ 7.25	
LABORER.....	\$ 7.25	
PAINTER (Including Drywall taping).....	\$ 8.16	
PLUMBER.....	\$ 7.70	
ROOFER, Including Built Up, Composition and Single Ply Roofs.....	\$ 7.25	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

**ATTACHMENT F
Form of Bid
Bid Fee Sheet
Bidder's Certification**

FORM OF BID

(This Form must be fully completed and placed under Tab #1 of the bid submittal.)

INSTRUCTIONS: The items listed below must be completed and included in the bid unless otherwise specifically noted. Please complete this form by marking X, where provided, to indicate that the referenced information has been included. Also, complete the Section 3 Statement and the Bidder’s Statement noted on the subsequent page:

X=ITEM INCLUDED	SUBMITTAL ITEMS
_____	Tab 1 Form of Bid (Attachment F)
_____	Tab 2 HUD Forms & Conflict of Interest Questionnaire(Attachment B)
_____	Tab 3 Profile of Firm Form, Company Profile (Attachment C)
_____	Tab 4 Client Information
_____	Tab 5 Joint Venture/Partnership Information
_____	Tab 6 Subcontractor Information
_____	Tab 7 Section 3 Preference
_____	Tab 8 S/W/MBE Small Business Plan
_____	Tab 9 Section 3 Good Faith Effort Compliance Plan
_____	Tab 10 Financial Viability and Other Information

SECTION 3 STATEMENT

Are you claiming a Section 3 business preference? YES___ or NO___. If “YES,” pursuant to the documentation justifying such submitted under Tab No. 8, which category are you claiming?

- _____ Category I – Owned by a public housing resident where work is performed
- _____ Category II – Owned by any other public housing resident
- _____ Category III – HUD Youthbuild Program
- _____ Category IV – 30% of workforce is Section 3 qualified or sub-contract greater than 25% of contract value to certified Section 3 Business Concern

Bid Fee Sheet

The undersigned proposer hereby states that by completing and submitting this Form and all other documents within this submittal, he/she is verifying that all information provided herein is, to the best of his/her knowledge, true and accurate, and that if SAHA discovers that any information entered herein to be false, that shall entitle SAHA to not consider or make award or to cancel any award with the undersigned party. Further, by completing and submitting the submittal, and by entering the costs where provided, the undersigned is thereby agreeing to abide by all terms and conditions pertaining to this IFB as issued by SAHA, in hard copy. Pursuant to all IFB Documents, all attachments, and all completed Documents submitted by proposer, including these forms, addendums, and all attachments, the undersigned proposes to supply SAHA with the services described herein for the fee(s) entered within the areas provided.

Base Bid:

Description	Unit of Measure	Base Cost
Rebuild Unit As Specified	Job	\$

Unit Price items: Unit price items are for unforeseen or additional requested work and are at the sole discretion of SAHA.

Landscaping	UOM	Price
Top Soil (less than 500C.Y)	Cu. yd.	
Top Soil (more than 500C.Y)	Cu. yd.	
Bermuda Sodding (less than 2,000 SY)	Sq. yd.	
Bermuda Sodding (more than 2,000 SY)	Sq. yd.	
ST Augustine Sodding (less than 2,000 SY)	Sq. yd.	
ST Augustine Sodding (more than 2,000 SY)	Sq. yd.	
Zysoia Sodding (less than 2,000 SY)	Sq. yd.	
Zysoia Sodding (more than 2,000 SY)	Sq. yd.	
Hydromulching	Sq. yd.	
2" diameter minimum Crepe Myrtle tree installation	Each	
Tree Trimming	Cu. yd.	
Concrete	UOM	Price
Remove Concrete curb (more than 500 LF)	Ln. ft.	
Install Concrete curb (more 500 LF)	Ln. ft.	
Remove Concrete Driveway & sidewalk (>1000 SF)	Sq. ft.	
Install Concrete Driveway & sidewalk (>1000 SF)	Sq. ft.	
Remove Concrete Driveway & sidewalk (<1,000 SF)	Sq. ft.	
Install Concrete Driveway & sidewalk (<1,000 SF)	Sq. ft.	
Remove Miscellaneous Concrete	Sq. ft.	
Plumbing	UOM	Price
Valve Box Adjustment	Ea.	
1/2" Type L Copper Pipe	Ln. ft.	
3/4" Type L Copper Pipe	Ln. ft.	
1" Type L Copper Pipe	Ln. ft.	
2" PVC drain pipe (sewer)	Ln. ft.	
4" PVC drain pipe (sewer)	Ln. ft.	
2" PVC pipe coupling (sewer)	Ea.	
Company Name:		

Plumbing continued	UOM	Price
4" PVC pipe coupling (sewer)	Ea	
2" PVC 90 connector (sewer)	Ea	
4" PVC 90 connector (sewer)	Ea	

Addenda Acknowledgements

Addendum #1 _____ Date _____

Addendum #2 _____ Date _____

Addendum #3 _____ Date _____

<hr/> Signature	<hr/> Date
<hr/> Printed Name	<hr/> Company
<hr/> E-mail address if available	
<hr/> Phone	<hr/> Fax

