



Procurement Department

INVITATION FOR BIDS (IFB)

FOR

**Fair Avenue Apartments Fire Protection Improvements
FOR**

**HOUSING AUTHORITY OF THE
CITY OF SAN ANTONIO, TEXAS
AND
AFFILIATED ENTITIES**

IFB# 1807-910-23-4821

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**

Fair Avenue Apartments Fire Protection Improvements

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 fire protection improvements and associated work at the Fair Avenue Apartments, 1215 Fair Avenue, San Antonio, TX 78223.

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 IFB 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	December 3, 2018
NON-MANDATORY PRE-SUBMITTAL MEETING	December 14, 2018 at 10:00 a.m. SAHA Central Office, 818 S. Flores, San Antonio, TX 78204
LAST DATE FOR QUESTIONS	December 17, 2018 at 4:00 p.m.
SITE VISIT	December 14, 2018 9:00 am to 3:00
BID DUE DATE	January 3, 2019 at 2:00 p.m. SAHA Procurement Dept. 818 S. Flores, San Antonio, TX 78204
ANTICIPATED APPROVAL BY THE BOARD	Februray/March 2019
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 for the fire protection improvements and associated work at the Fair Avenue Apartments, 1215 Fair Avenue, San Antonio, TX 78223.
- 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 reduce or increase estimated or actual quantities in whatever amount necessary 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 RFP, 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 \$100.00 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.
- 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:** All Surety Bonds shall be issued by companies licensed to do business in the State of Texas, approved by the U.S. Treasury and “A” rated or better by A. M. Best. Acceptable Payment & Performance Bonds shall be provided to SAHA within ten (10) days after Contract execution by both parties. Individual Sureties will not be accepted.
- 3.17.1 Bid Bond:** 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 Notice to Proceed:** Start work date will be determined by the SAHA Project Manager and Contractor’s Manager. Contractor shall not begin work until a Notice to Proceed is received from SAHA signed by the contracting officer.

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 **240 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 BID:

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

- 4.3.2 **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.

4.3.2.1 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, prior to the question submission deadline specified herein, 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. Bid Bond is also placed 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 rehabilitation 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 full address;
 - 5.4.5.3** Detailed description of services provided to the client;
 - 5.4.5.4** Beginning date of service;
 - 5.4.5.5** Completion or projected completion date, and
 - 5.4.5.6** Is project Over/Under budget and construction schedule.
- 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 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".
- 5.6.1 Subcontracting Opportunities:** SAHA has identified the following opportunities for the use of Section 3 and SWMBE sub-contractors:
- Electrical
 - Concrete
 - Painting

- Plumbing

This list should not be considered as all inclusive or mandatory.

- 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 3 most recent years of financial statements (profit and loss and cash flow minimum) 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/DISQUALIFICATION

- 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. In determining the best value SAHA may consider:

- 7.4.1 The purchase price;
- 7.4.2 The reputation of the bidder and his goods or services;
- 7.4.3 The quality of the goods or services;
- 7.4.4 The extent to which the goods or services meet SAHA's needs;
- 7.4.5 The total long term cost;
- 7.4.6 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:

Table on next page.

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 Applicable to this Bid
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 proposal 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 RFP or contract, the alleged aggrieved protestant must have been involved in the RFP process in some manner as a prospective proposer (i.e. recipient of the RFP 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 Proposals or proposals 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, any 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 Indemnification.** The Proposer 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 Proposer, 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, to the extent resulting in whole or

in part from the negligent acts or omissions of the Proposer, any subcontractor, or any employee, agent or representative of the Proposer or any subcontractor. **PROPOSER ACKNOWLEDGES AND AGREES THAT THIS INDEMNITY CONTROLS OVER ALL OTHER PROVISIONS IN THE AGREEMENT, SURVIVES TERMINATION OF THIS AGREEMENT.**

For clarification purposes, Proposer 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 Proposer*, its employees, sub-subcontractors, suppliers, manufacturers, or other persons or entities for whose acts Proposer 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.

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 proposal, 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.

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ATTACHMENT A

Specifications, Drawings, and Hazardous Materials Survey Report



October 29, 2018

Mr. Ronald M. Bishop, MPH, CIH
Individual Asbestos Consultant
AEHS, Inc.
4402 Centergate
San Antonio, TX 78217

RE: Fair Avenue Apartments – Variance Request

Dear Mr. Bishop:

The Texas Department of State Health Services (DSHS) has received your request for variance dated August 22, 2018, regarding the proposed use of shaving cream and PVC pipe cylinders to drill holes into textured drywall and joint compound with no containment in an asbestos abatement project at the Fair Avenue Apartments located at 1215 Fair Avenue, San Antonio, TX 78223. The variance request was submitted to DSHS in compliance with the Texas Asbestos Health Protection Rules (TAHPR), Section 295.60(a)(2), which authorizes DSHS to approve work practices that vary from the requirements of TAHPR, including alternative control practices such as dry removal or no negative air, as long as they are certified as equally protective of public health by a Certified Industrial Hygienist (CIH) or a licensed Professional Engineer.

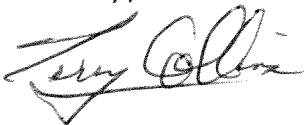
According to the proposed scope of work for the installation of the new fire alarm system and associated hardware submitted with your variance request for this project, holes will be drilled through a section of PVC pipe cylinder filled with shaving cream and into the asbestos-containing textured drywall and joint compound. The asbestos-containing building material will be caught in the shaving cream and be disposed of after every drill hole. This project specification has also been reviewed and certified by you, Mr. Ronald M. Bishop, MPH, CIH as being equally protective of public health.

After careful review of the proposed project scope of work, including the asbestos exposure assessment, the DSHS approves your request for variance from the TAHPR requirement for no negative air during removal, as long as the following conditions are met:

- The project notification submitted to DSHS must include the alternate method described in the proposed scope of work.
- The proposed scope of work for drilling through PVC cylinders packed with shaving cream to catch and hold asbestos-containing drywall texture and joint compound before the asbestos fibers can become airborne must be strictly followed.
- A complete specification for the asbestos abatement work must be on-site during all phases of the project.
- Asbestos-containing waste material (ACWM) must be kept inside the PVC cylinder and remain imbedded in the shaving cream after drilling of the hole and the drill bit shall be removed slowly out of the shaving cream and immediately wet wiped as to minimize any asbestos fiber release to the outside air. The PVC cylinder with ACWM and the contaminated wet wipe(s) must be immediately collected and bagged after every single use and then disposed of properly in accordance with the TAHPR.
- The project scope of work is limited to the Fair Avenue Apartments located at 1215 Fair Avenue, San Antonio, TX 78223.

DSHS believes that close adherence to these provisions, in conjunction with all other requirements of the TAHPR, will reduce the risk of asbestos exposure for both the workers and the public. If you have any questions or need additional information you may contact us by electronic mail at: asbestoshelp@dshs.texas.gov or by telephone at 512-834-6787.

Sincerely,



Terry W. Collins, Asbestos Group Manager
Surveillance Section, Environmental Unit
Consumer Protection Division
Texas Department of State Health Services



Annabelle R. Dillard, Manager
Environmental Hazards Unit, PSQA Section
Consumer Protection Division
Texas Department of State Health Services

Ronald M. Bishop
October 29, 2018
Page 3

Enclosures:

- Variance Request Letter from Ronald M. Bishop, MPH, CIH, dated August 22, 2018
- Proposed scope of work for drilling through textured drywall and joint compound without containment for the installation of a new fire alarm system and associated hardware
- Negative Exposure Assessment (Asbestos Exposure Assessment)

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 9, 2018

Mr. Ken Ofunrein, Inspection Branch Manager
Asbestos Program
Texas Department of State Health Services
P.O. Box 149347
Austin, Texas 78714-9347

Subject: Referral of Certain Asbestos-Related Complaints

Dear Mr. Ofunrein:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the Memorandum of Understanding (MOU) between TCEQ and the Texas Department of State Health Services (DSHS) in Title 30 Texas Administrative Code (TAC) Chapter §7.122. DSHS has jurisdictional authority to regulate and has primary responsibility for emissions related to asbestos demolition and renovation activities per 40 Code of Federal Regulations (CFR) Part 61, Subpart M, including 40 CFR §61.150, which establishes standards for management and disposal of asbestos containing waste. DSHS's regulations require building owners and their agents to properly manage and dispose of asbestos-containing waste material (see 25 TAC §§295.34(b), 295.58(l)) and require asbestos transporters to obtain a license, comply with labeling requirements for asbestos-containing waste material, and ensure that asbestos-containing waste materials are properly disposed of (25 TAC §295.56). As stated in the MOU, TCEQ's role in the current asbestos regulatory framework is derived from 40 CFR §61.154 and applies to the owner or operator of active solid waste disposal sites (landfills), not the generator or transporter. Therefore, we recommend that complaints alleging unauthorized disposal against generators or transporters of asbestos-containing waste material be investigated by DSHS.

Please see the enclosed attachment regarding the referral of two complaints received by the TCEQ Region 4 Dallas-Fort Worth Office to DSHS for further evaluation.

If there are any clarifications needed regarding the jurisdictional understanding or referral of these complaints, please contact TCEQ Office of Legal Services, Litigation Division at 512-239-3400 for further discussion.

Sincerely,

A handwritten signature in cursive script, appearing to read "Erin Gorman".

Erin Gorman
Waste Section Manager
DFW Regional Office

Enclosure: Complaint Referrals

cc: Mr. James A. Zoretic, MD, MPH, Regional Director; Texas Department of State Health Services;
1301 South Bowen Road, Suite 200; Arlington, Texas 76013

TCEQ DFW REGION COMPLAINT REFERRALS TO DSHS REGARDING ASBESTOS

The TCEQ Region 4 Dallas-Fort Worth Office recently received two complaints from DSHS alleging the unauthorized disposal of regulated asbestos-containing material (RACM) by a generator and/or transporter. The TCEQ formally requests these two complaints be referred to DSHS to investigate whether the building owner has complied with the regulations relating to on-site asbestos waste management and transportation to the waste disposal site. The TCEQ could be notified for a potential investigation when the complaint alleges mismanagement of RACM once it has been received at the waste disposal site.

Complaint 1:

Date Received: 05/02/2018

Complainant: Mr. Ted Wyman, DSHS Inspector

Incident Description: The complainant alleges that the property owner is mismanaging and disposing of friable asbestos waste at an unauthorized facility.

Location: Super Value Inn

Address: 111 Interstate 20 Frontage Road, Weatherford, Texas 76087

DSHS was already conducting a separate investigation related to this site but TCEQ was asked to investigate the unauthorized disposal allegation.

Complaint 2:

Date Received: 08/16/2018

Complainant: Mr. Ted Wyman, DSHS Inspector

Incident Description: The complainant alleges that the property owner is mismanaging and disposing of friable asbestos waste at an unauthorized facility.

Location: Medical and Dental Offices

Address: 3232 Broadway Boulevard, Garland, Texas 75043



AEHS, Inc.

An Environmental, Health, and Safety Consulting Firm

4402 Center Gate, San Antonio, Texas 78217 (210) 656-9300 fax (210) 656-8499

August 22, 2018

Mr. Todd Wingler, PE
Environmental and Sanitation Licensing Group MC 2835
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

Dear Mr. Wingler:

In concert with our previous telephone conversations, this letter is requesting a variance from the Texas Asbestos Health Protection Rules – TAHPR §295.60. OPERATIONS: ABATEMENT PRACTICES AND PROCEDURES FOR PUBLIC BUILDINGS. This variance request is in accordance with TAHPR §295.60(a)(2). The control methods are at least as protective of the public health (workers, building occupants, and the environment).

An Asbestos Exposure Assessment for simulating the installation of a new fire alarm system including the attachment of pipe run brackets, smoke alarms, smoke alarm strobes, etc., was conducted. This involved the monitoring during 50 simulated attachments which included the disturbance of asbestos containing textured drywall at the Fair Avenue Apartments. The apartment chosen was typical, included asbestos containing texture, and was unoccupied. The specific methodology to simulate the proposed variance is at Enclosure 1. Additionally, the monitoring results are included with Enclosure 1.

Based on the results of the Asbestos Exposure Assessment, a Negative Exposure Assessment was prepared and is included as Enclosure 2.

This information is provided by Ronald M. Bishop, MPH, CIH. Ron is a Certified Industrial Hygienist, Certified Safety Executive, Certified Environmental and Safety Compliance Officer as well as a Texas Department of State Health Services (TDSHS) Mold Assessment Consultant, Lead Risk Assessor and Project Designer, and Asbestos Consultant as well as a Green Consultant. Ron Bishop is also a TDSHS Lead, Asbestos, and Mold instructor for AEHS, Inc., which is a TDSHS certified Training Provider in the aforementioned disciplines.

The results of the air monitoring indicated that all sample results were at least a magnitude below the clearance level for asbestos abatement and therefore the general public could occupy the area.

If you have any questions or desire additional information, please contact Ron Bishop at 210 656-9300.

Sincerely,



Ronald M. Bishop, MPH, CIH

ABIH 814

TDSHS No. 105492

Asbestos Exposure Assessment

- a. Installed critical barriers (2 layers of 6 mil thick poly) covering all openings to include all supply and return diffusers and the exterior door.
- b. The room was set up to be placed under negative pressure of at least -0.02 wc using a negative air machine.
- c. A three stage DECON was erected IAW TAHPR.
- d. The simulation was conducted by a TDSHS licensed abatement contractor using licensed supervisor(s) and registered workers. All personnel were current in their respirator fit-testing, medical evaluation, and training. The negative air machine was turned off during the simulation to represent actual conditions.
- e. The PPE included disposable coveralls, half facepiece respirators with P100 filters, and nitrile gloves.
- f. Three (3) inch in diameter cylinders one (1) inch thick were used to surround the attachment location. The cylinders were made from PVC pipe.
- g. The cylinders were placed over the location where the drilling disturbance was to occur and filled with a foamy shaving cream.
- h. After the drilling occurred, the cylinder was removed and the shaving cream wiped with a disposable rag from the wall and cylinder. The shaving cream was disposed of into a properly labelled asbestos waste container for disposal into a regulated disposal facility.
- i. Air monitoring occurred as one personal sample, one area sample, and one sample at the exit to the room.
- j. The samples were analyzed by AEHS, Inc., which is a TDSHS licensed PCM laboratory. All results were less than 0.01 fibers per cubic centimeter and in fact approximately 1 magnitude below the clearance level.
- k. The room was then placed under negative pressure and cleared (clearance) IAW the TAHPR.



DAILY LOG OF ACTIVITY

PROJECT NO: 18-097 DATE: 8/20/2018

LOCATION: 1215 Fair Ave.

CONTRACTOR: TLI SUPERVISOR: Ray M.

ACTIVITY:

0800 - AEHS arrives on site

0815 - Room 210 was occupied so we are drilling holes in 211

0830 - Background pumps are up and running while crew begins to prep.

0845 - Begin paperwork

0900 - Check on prep work.

1000 - Ron Bishop arrives on the job site. / Backgrounds finish running

1015 - crew continues to prep area.

1045 - Pumps have started and work has begun.

1130 - work has finished (all 50 holes have been drilled)

1145 - crew begins cutting out hole where all 50 holes were

1200 - crew has finished cutting hole out of the wall / final clean up

1250 - crew has finished final clean up / AEHS take in pumps for clearance

1300 - All three low-flow pumps have been turned off and collected Clearance samples have begun

AEHS REPRESENTATIVE SIGNATURE: [Signature]

CREW SIZE: 3 NEGATIVE AIR UNITS: 1 RESPIRATOR TYPE: half/mouth

ACM TO BE REMOVED: Drilling holes

DECON: MANUALLY CONSTRUCTED POP-UP TRAILER

AIR SAMPLES COLLECTED: INSIDE CONTAINMENT [checked] OUTSIDE CONTAINMENT [checked]

NEGATIVE AIR MACHINE _____ DECON _____ BAG OUT _____ BACKGROUND _____

PERSONNEL [checked] PCM CLEARANCE [checked] TEM CLEARANCE _____



DAILY LOG OF ACTIVITY (CONTINUED)

PROJECT NO: 18-097

DATE: 8/20/2018

1430- Samples for clearance are finished and begin reading

1520- Clearance has been achieved and AEHS packs up equipment

1550- AEHS leaves the job site.

1615- AEHS arrives @ offices.

Air Sampling Log

Project Number : 18-097 1215 Fair Ave.

Project Name : 1215 Fair Ave.

Date : 8/20/2018

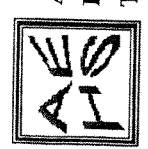
Sampled By : *Chuy Gising*

Analyzed By : *Chuy Gising*

Sample Number	Type	Sample Location Name / SSN	Pump Number	Flow Rate (L/min)	Time		Total Time (min)	Total Volume (L)	Fiber Count	Results (f/cc)	TWA (f/cc)
					Start	Stop					
1	B	Background	2140	14.0	08:30	10:00	90	1260	135/100	0.005	/
2	B	Background	1881	14.0	08:30	10:00	90	1260	17/100	0.006	/
3	A	Inside Containment	070	2.0	10:45	12:50	125	250	5/100	0.009	/
4	A	Outside Containment	066	2.0	10:45	12:50	125	250	35/100	0.006	/
5	P	Joe Snyder	060	2.0	10:45	12:50	125	250	3/100	0.006	0.002
6	C	Inside Containment	1881	14.0	13:00	14:30	90	1260	16/100	0.006	/
7	C	Outside Containment	2140	14.0	13:00	14:30	90	1260	4/100	0.001	/

Types: A = Area B = Background P = Personnel C = Clearance FB = Field Blank
 Comments :

*Note: TWA calculated for actual exposure time which was greater than 480 minutes (8 hours).
 *Note: TWA calculated using 8 hours (assume that person had zero exposure for balance of the 8 hours).
 *Note: NIOSH Method 7400 used, Estimate LOD: 7 fibers/mm²



AEHS, Inc. 4402 Centergate, San Antonio, Texas 78217
 Phone: (210) 656-9300 Fax: (210) 656-8499
 TDSHS Asbestos Consulting Agency License # 10-0335 TDSHS Asbestos Laboratory License # 30-0295



Visual/Final Inspection
Asbestos Removal, Renovation, & Demolition

Date: 8/20/2018

Project Number: 18-097

Location: 1215 Fair Ave.

1. Visual

Residual dust on:	Yes	No
Floor	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ceiling	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ventilation Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pipes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ducts	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lights	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other _____	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Record any other problems encountered: _____

AEHS Representative: *Clay Brey*

Owner Representative: _____

Contractor Representative: _____

2. Final Clearance

Air Sampling Date: 8/20/2018 Aggressive Passive _____

Rate: 14.0 Time: 90 Volume: 1200 Analytical Method: PCM

Results: 0.000 f/cc 0.001 f/cc _____ f/cc _____ f/cc
_____ f/cc _____ f/cc _____ f/cc _____ f/cc

PCM Clearance Standard: 0.01 f/cc TEM Clearance Standard: 70 Structures/mm²

Date Clearance Standard Met: 8/20/2018

I certify that clearance was achieved

Signature of AEHS Representative: *Clay Brey*

Negative Exposure Assessment

Based on the Asbestos Exposure Assessment, this Negative Exposure Assessment is provided in support of the variance request for installing of a new fire alarm system including the attachment of pipe run brackets, smoke alarms, smoke alarm strobes, etc., was conducted. The results depicted that the procedures were at least as protective of public health as the requirements in Texas Asbestos Health Protection Rules – TAHPR §295.60. OPERATIONS: ABATEMENT PRACTICES AND PROCEDURES FOR PUBLIC BUILDINGS.

1. Procedure:

- a. Install critical barriers (2 layers of 6 mil thick poly) covering all openings to include all supply and return diffusers and the exterior door.
- b. Construct a one stage DECON.
- c. Place a drop cloth of six mil thick poly under the area where the penetrations will occur.
- d. Use three (3) inch in diameter cylinders (PVC pipe) one (1) inch thick to surround the attachment location.
- e. The cylinders will be placed over the location where the drilling disturbance will occur and filled with a foamy shaving cream.
- f. After the drilling occurs, the cylinder will be removed and the shaving cream wiped with a disposable rag from the wall and cylinder. The shaving cream will be disposed of into a properly labelled asbestos waste container for disposal into a regulated disposal facility.
- g. Fold the drop cloth inwardly and place into the properly labelled asbestos waste container.
- h. Wet wipe the critical barriers and place into the properly labelled asbestos waste container.
- i. Wet wipe the DECON.
- j. HEPA Vacuum the Room.

2. Worker Protection and Training.

- a. All workers will be trained in asbestos awareness in accordance with OSHA's 29 CFR 1926.1101. The asbestos awareness training will include: Background, Hazards, PPE, and Task Specific procedures.
- b. Personal Protective Equipment will include disposable coveralls and nitrile gloves.

c. All personnel will exit through the single stage DECON by washing all exposed skin after removing of the gloves and coveralls.

3. Occupant Protection.

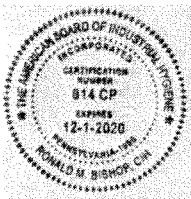
- a. Critical barriers as per procedure.
- b. DECON as per procedure.
- c. Final cleaning as per procedure.
- d. Wet wipe the critical barriers and place into the properly labelled asbestos waste container.
- e. Wet wipe the DECON.
- f. HEPA Vacuum the Room.

4. Environmental Protection.

- a. Critical barriers as per procedure.
- b. DECON as per procedure.
- c. Final cleaning as per procedure.
- d. Fold the drop cloth inwardly and place into the properly labelled asbestos waste container.



Ronald M. Bishop, MPH, CIH
ABIH 814
TDSHS Asbestos Consultant No. 105492



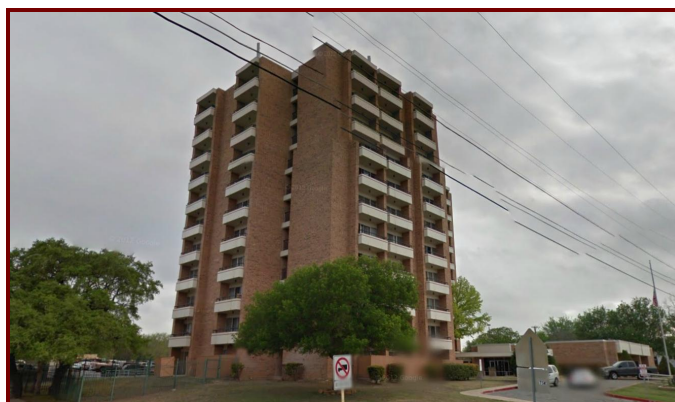
ASBESTOS ABATEMENT SPECIFICATIONS

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS

1215 Fair Avenue
San Antonio, Texas

Terracon Project No. 90177720R2

October 9, 2018



Prepared For:
San Antonio Housing Authority
San Antonio, Texas

Prepared by:
Terracon Consultants, Inc.
San Antonio, Texas
TDSHS Consultant Agency License No. 100157

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

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

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

Terracon

Environmental



Facilities



Geotechnical



Materials

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Attachments:

- Abatement Drawings
- Photographs
- Asbestos Inspection Report Information



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

SCOPE OF WORK - ASBESTOS ABATEMENT

Project: Fair Avenue Apartments
1215 Fair Avenue
San Antonio, Texas 78223
Terracon Project No. 90177720R2

Asbestos abatement will be accomplished in one phase. Asbestos abatement is to be conducted in select interior portions of the building to accommodate proposed renovation activities. A Negative Exposure Assessment (NEA) will be conducted prior to any abatement activities. Work will not proceed without an NEA that demonstrates exposure levels are less than 0.01 f/cc by PCM. Note: Any workers conducting the installation of pipe run brackets shall have a minimum of 2-hour asbestos awareness training.

I. Material, Quantity and Location

The work will consist of the removal of the following materials in the approximate quantities listed at the site. All work will be conducted by properly licensed personnel in accordance with applicable Federal, State and Municipal regulations. **(Note: The Contractor is responsible for verifying material quantities and locations prior to submission of the price quote to the Owner. The Contractor will perform work for the materials indicated, regardless of actual quantities. Please see the attached drawings for approximate locations.)**

Fair Avenue Apartments:

- § **Drywall Construction** - The multi-textured drywall construction materials utilized throughout the building (except for walls in Elevator Machine Room (east and central), and the walls and ceilings of the Basement Cargo Elevator Control Room were found to contain 2% - 3% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being friable. Due to the limited scope of the asbestos survey, total quantities of asbestos-containing materials (ACM) located in the building are undetermined. The current project plans involve installation of a new fire alarm system including the attachment of pipe run brackets, smoke alarms, smoke alarm strobes, pull stations, CO detectors, wall/ceiling mounted speakers, metallic raceway, miscellaneous items, etc. on ACM drywall construction. The existing fire alarm system shall be removed after the new system is installed and commissioned and accepted in order to maintain a fully functional fire alarm system within the building. In addition to the current project plans, the abatement contractor will remove a four foot by four foot (4' x 4') section of drywall construction ceiling in each unit to allow for access to the interstitial ceiling space by other trades. The current project also involves removal of similar existing equipment and



Will C. DeVeau / TDSHS IAC # 105734
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materials listed above including wiring. The select removal and installation areas shall be field verified and marked by appropriate personnel prior to abatement activities to ensure the correct locations are adequately addressed.

- § Moisture Barrier – The black moisture barrier materials utilized on various Crawlspace walls adjacent to the 1st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement were found to contain 2% Chrysotile asbestos. The asbestos-containing moisture barrier materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the limited scope of the asbestos survey, total quantities of ACM located in the building are undetermined. It is estimated that approximately 16 square feet of moisture barrier materials will be removed from select locations during the project. The select removal areas shall be field verified and marked by appropriate personnel prior to abatement activities to ensure the correct locations are adequately addressed.

II. Work Practices

A. Respiratory Protection:

During the installation/removal of the fire alarm system and removal of asbestos-containing drywall construction and moisture barrier materials from the interior and exterior of the building, half-face respirators, equipped with filter cartridges designed for asbestos-containing dusts and mists, vapors, and color coded in accordance with ANSI Z228.2 (1980), will be employed by all workers working within the regulated area(s). Certification that the workers have been fit tested in accordance with current OSHA guidelines will be provided as part of Worker Documentation. **The Abatement Contractor shall ensure use of the appropriate respiratory protection for the work being performed and recognizes that these requirements are only minimum acceptable standards.** The Contractor will furnish respirator filter cartridges as required by the Consultant.

B. Protective Clothing

During installation/removal of the fire alarm system and removal of the asbestos-containing drywall construction and moisture barrier materials from the interior areas, double protective suits will be worn by the workers and boots and gloves will be available to each worker as needed. The workers will remove the outer suit within the regulated work area and will proceed directly to the decontamination area. Each suit will be properly disposed of at the conclusion of the work period. The workers performing the abatement will decontaminate through a single-chambered wet decontamination system which will be constructed in a remote location easily accessible by workers who will proceed to the decontamination area after removing



Will C. DeVeau / TDSHS IAC # 105734
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the outer suit within the regulated work area.

C. Temporary Facilities/Facilities

In Interior regulated areas (Installation/Removal of Fire Alarm System and Glove-Bag removal) and Crawlspace Locations Where Materials are to be removed (asbestos-containing drywall construction and moisture barrier), the work area will be Regulated with appropriate barrier tape and the Contractor shall display all appropriate OSHA and TDSHS signage. The Workers shall be in proper protective equipment and decontaminate through a wet decontamination unit erected in a central location accessible to the workers. The materials will be removed in interior and exterior regulated areas with a double layer of 6-mil polyethylene covering the area in the vicinity/below the work areas utilizing wet methods.

D. Removal

The **Contractor** will perform the removal and disposal in accordance with current local, state and federal regulations.

1. **Asbestos-Containing Drywall Construction Materials:** Comply with wet removal procedures. The Contractor shall construct a single use glove bag, glove sheet, or control bag for removal in a single specific area. **The contractor shall verify and provide glove bags manufactured for the removal of drywall construction.** A glove box may be constructed using a single use glove bag, glove sheet, or control bag. The glove bag, glove sheet, or control bag shall be constructed in such a way as to allow a tight seal to the wall/ceiling being affected. **The drywall construction materials shall be removed in their entirety including associated insulation and/or fastening devices and disposed of as ACM. The Contractor shall remove at least six inches of texture from any remaining drywall construction walls/ceilings adjacent to the drywall construction walls/ceilings scheduled for complete removal and/or texture removal in the regulated area(s) to accommodate build-back activities by others in the area(s) being abated. All removal areas shall be field verified and marked by appropriate personnel prior to abatement activities to ensure the correct locations are adequately addressed.** Once the work areas are complete, the Contractor shall install a temporary cover on each opening with a single layer of poly, apply duct tape around the edges of the poly to the adjacent wall/ceiling areas where drywall has been removed, and insert thumb tacks in the taped areas for additional support.

Where specified for removal of drywall construction texture only, the texture materials (including tape/float/joint compound) shall be straight cut and removed back as



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Asbestos Abatement Specifications

Fair Avenue Apartments, Fire Protection Improvements ■ San Antonio, Texas
October 9, 2018 ■ Terracon Project No. 90177720R2



marked by appropriate personnel leaving the exposed drywall material in place. The exposed cut edge of the texture and the exposed drywall material shall be encapsulated with a penetrating type encapsulant product compatible with re-texturing materials. **Note: All existing wall anchors, molly bolts, hooks, etc. in contact with drywall construction shall be removed and the texture straight cut and removed to approximately 6 inches from the item removed.**

It is intended that the cutting and/or removal of any drywall construction material will be conducted by the glove bag method within a regulated area. The glove bag, glove sheet, glove box or control bag removal work areas will be regulated with barrier tape and appropriate signage shall be placed on the work area entry. Drop sheets will be installed in the area below the drywall construction which will be removed. Place drop sheets in a manner which will cover the area below the glove bag, glove sheet, glove box or control bag and any area where workers stand when working within these enclosures.

Slit top of the glove bag, glove sheet, or control bag open (if necessary) and cut down the sides to accommodate the size of the wall/ceiling areas to be abated. Place 6 mil disposal bag inside of the glove bag, glove sheet, glove box, or control bag. Where appropriate, install glove bag to box frame and seal by appropriate and approved means. Place necessary tools into the pouch located inside the glove bag, glove sheet, or control bag. Place one strip of adhesive tape along the edge of the open top slit of glove bag, glove sheet, or control bag for reinforcement.

Place the glove bag, glove sheet, glove box or control bag around the section of drywall construction to be abated, and then secure the edges of the enclosures with adhesive tape.

Test the seal of glove bags, glove sheets, glove boxes or control bags with a smoke tube and aspirator bulb. Place tube into water sleeve (two-inch opening to glove bag, glove sheet, or control bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag, glove sheet, or control bag and look for smoke leaking out (especially at top and ends of the glove bag, glove sheet, or control bag). If leaks are found, make repairs using adhesive tape and re-test.

Remove drywall construction from inside the glove bag, glove sheet, glove box or control bag as follows:

Insert wand from garden sprayer through water sleeve. Adhesive tape water sleeve tightly around the wand to prevent leakage.

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

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Expiration Date: 03/10/2019

Two workers are required to operate each glove bag, glove sheet, or control bag. One person places his hands into the long-sleeved gloves while the second person directs garden sprayer at the work.

During the removal of the drywall construction materials, continual wetting of the material will occur. Place pieces of drywall construction materials in the bottom of the bag without dropping.

Rinse tools with water inside the bag and place back into pouch. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the HEPA vacuum and fully collapse the glove bag, glove sheet, glove box or control bag. Remove the vacuum nozzle, twist water sleeve closed and seal with adhesive tape.

From outside the glove bag, glove sheet, glove box or control bag, pull the tool pouch away from the bag. Place adhesive tape over twisted portion and then cut the tool bag from the glove bag, glove sheet, glove box or control bag, cutting through the twisted-taped section. Contaminated tools may then be placed directly into next glove bag, glove sheet, glove box or control bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste.

Sliding a glove bag, glove sheet, or control bag from one removal section to another is prohibited. Glove bags, glove sheets, and control bags are single use only. If more than one adjacent section of drywall construction is to be removed, a new glove bag, glove sheet, or control bag must be used for each section. After removing the glove bag from a glove box frame, the remaining 6 mil poly will be cleaned using wet wipes before moving to the next section. The 6 mil poly will be removed from the glove box frame and disposed of as ACM and the frame will be cleaned with wet wipes before moving to the next unit.

The removed glove bag, glove sheet, glove box or control bag shall be placed in a second disposal bag prior to being removed from the regulated work area. The bags shall have generator labels attached before being transferred to the prepared waste trailer. All resulting waste will be disposed as described in item E of this section.



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Added Procedure for installation of pipe run bracket screws in asbestos containing drywall construction: These materials will be installed with as little disturbance as possible. The work area will be regulated with barrier tape and a single layer of 6-mil polyethylene (drop cloth) shall be used below each work area where pipe run bracket screws are to be installed.

The material shall initially be sprayed with an adequate amount of shaving cream covering the areas where the bracket and screws will attach to drywall construction. Do not over saturate or cause excess drip. During installation of the screws, workers will utilize a drill. Following installation of the bracket screws, the drywall construction work area and bracket shall be wet wiped and/or HEPA vacuumed. Workers shall be in proper protective equipment and decontaminate through a single-chamber decontamination chamber erected in a central location accessible to the workers. The waste resulting from the installation operations shall be kept wet and placed into disposal bags as soon as practical. All resulting waste will be disposed of in accordance with the guidelines discussed in Item E of the specification.

2. **Asbestos-Containing Moisture Barrier Materials (Crawlspace):** These materials will be removed with as little disturbance as possible. The work will be conducted within an area regulated with barrier tape and drop cloths, and shall be used in the work area where these materials are to be removed. **Workers shall be in proper protective equipment and decontaminate through a single-chamber wet decontamination unit erected in a central location accessible to the workers.** The materials will be removed in a regulated area with a single layer of 6-mil polyethylene covering the area in the vicinity/below the work areas.

The moisture barrier materials will be addressed as follows: The material shall initially be sprayed with amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate the material. Do not over saturate or cause excess dripping. Once saturated, the material attached to the structure shall be manually removed from the concrete substrate as intact as possible. All nails, fasteners impacted by the moisture barrier shall be removed and disposed of with the mastic/tar/sealant. The debris which accumulates on the drop cloths shall be kept wet and placed into disposal bags as soon as practical. The clean surfaces will be encapsulated after passing a visual inspection conducted by a Terracon representative. All waste resulting from removal operations will be disposed of in accordance with the guidelines discussed in Item E of the specification.



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E. Disposal

1. Once the ACM is removed (including regulated area materials, i.e., poly, tape, etc.) it will be double bagged and labeled in accordance with Texas Department of State Health Services (TDSHS) and OSHA guidelines. Pre-printed Generator Labels shall be affixed to each bag prior to being placed in the lined waste disposal dumpster or trailer.
2. All waste will be labeled in accordance with 29 CFR 1910.1200 (f) of OSHA's Hazard Communication standard, and will contain the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

3. The area between the bag-out area and the prepared waste receptacle shall be regulated with barrier tape during bag-out operations. The waste receptacle will have asbestos specific signage attached during loading and unloading activities. The waste dumpster or trailer shall remain secured during all other periods.
4. The waste will be disposed in an approved landfill. The waste will be transported to the landfill in a lined closed top receptacle. Verification of disposal at the landfill will be provided to the Owner by **Contractor** via the TDSHS Waste Manifest.

F. Work Area Clearance

Aggressive Phase-Contrast Microscopy (PCM) clearance sampling will be conducted in accordance with the NIOSH 7400 Method A, in any regulated area (per floor level completion) in which abatement has occurred. Minimum sample volume will be 1,250 liters per sample. Clearance will be achieved if no sample is reported greater than 0.01 fibers per cubic centimeter (f/cc) by the analysis report from the licensed laboratory.

III. Contractor Submittals

Submittals required for proper execution include but are not limited to the following:



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

Asbestos Abatement Specifications

Fair Avenue Apartments, Fire Protection Improvements ■ San Antonio, Texas
October 9, 2018 ■ Terracon Project No. 90177720R2



Pre-Construction Submittals (submitted to **Consultant**)

Regulatory Notification Information
Plan of Action
Fire Action Plan
Emergency Phone List
Project Schedule
Copy of Written Respirator Program which conforms to 29 CFR 1910.134(b)
OSHA Material Safety and Data Sheets (Product Handling)

Construction Submittals (submitted to **Consultant** before start of work on-site)

Licenses: Contractor, Supervisor, Transporter(s)
NESHAP Training Certificate
Personal Air Monitoring Lab Results
List of Workers
Worker Registration Certificates
Medical Examination Results
Worker Training Certificates
Respiratory Fit Test Certificate
Certificates of Worker Acknowledgement

Project Closeout (**submitted to Consultant no later than ten (10) working days following completion of the project**)

Contractor's Daily Log
Waste Disposal Manifest Copies
Certificate of Completion (if required)
Releases, Occupancy Permits (if applicable)
Personal Air Monitoring Lab Results (If applicable)

RESUBMISSION:

Revise submittals as required and resubmit as specified for initial submittal. Indicate any changes which have been made other than those requested by **Consultant**.

CONTRACTOR RESPONSIBILITIES:

Illegible submittals will be rejected and returned for re-submittal.

Schedule submittals according to general flow of Work and so as to allow for adequate and timely review of submittals by **Consultant**.

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

Review submittals prior to submission and submit to **Consultant** in accordance with provisions herein.

Verify field measurements, construction criteria, catalog numbers and similar data.

Coordinate submittals with requirements of Work and Contract Documents.

Contractor's responsibility for errors or omissions is not relieved by **Consultant's** review. **Contractor's** responsibility for deviations from requirements of Contract Documents is not relieved by **Consultant's** review, unless **Consultant** is notified of deviations in writing at time of submittal, and gives written review of specific deviations.

Do not begin work which requires submittals until reviewed submittals have been reviewed and approved by **Consultant**.

If required, reproduce and distribute copies after **Consultant's** review.

CONSULTANT'S RESPONSIBILITIES:

Review submittals within two working days or indicate in writing reasons for reviews which require additional time.

Review for conformance with design concept of project and information given in Contract Documents.

Indicate results of review and return submittals to **Contractor** for distribution.

Consultant is not responsible for verification of field measurements, construction criteria, catalog numbers and other similar data.

Review of separate items does not constitute review of an assembly in which items function.

IV. Construction Notes

No asbestos related activities will take place at the work site without prior notification to the **Consultant** by the **Contractor** and the presence of the **Consultant** at the work site.

The **Contractor** shall be responsible for submission of the TDSHS 10-day Asbestos/Demolition Notification Form. The **Owner** shall be responsible for payment of notification fees associated with the TDSHS 10-day Asbestos/Demolition Notification Form.

The **Contractor** or the **Owner**, at the **Owner's** discretion, will remove all movable items from



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the work areas prior to commencement of abatement activities.

During the pre-cleaning phase of abatement operations, all exposed non-movable equipment will be wet wiped, HEPA vacuumed and covered with six-mil polyethylene.

The **Contractor** will be responsible for providing water and electricity to the work areas and as needed by the Consultant. Water and electrical service are present at the site at this time and will be available for Contractor use. All electrical connections and outlets shall be protected at all times by ground fault circuit interrupters.

The **Contractor** is to be current and in good standing on all asbestos abatement notification fees. The **Owner** reserves the right to verify **Contractor's** standing.

The **Contractor** shall maintain all records required by TDSHS Texas Asbestos Health Protection Rules Section 295.62 Operations: Recordkeeping

Contractor parking and disposal dumpster areas will be as designated by the **Owner**. The **Contractor** will keep work and parking areas clean.

Prior to any asbestos abatement activities, the **Contractor** will provide a licensed electrician to provide power lock-out and tag-out of all circuits to be affected by the asbestos abatement activities. Lock-out/Tag-out must meet OSHA 1910.147 requirements. All electrical circuits in the regulated and/or contained area shall have ground-fault interrupter (GFCI) units installed outside the contained work area.

Exhaust negative pressure ventilation system to outside of building. Plywood inserts or a similar hard barrier shall be required for building security on any building openings used for exhaust purposes.

The **Contractor** shall arrange the use of on-site toilet facilities with the Owner or provide temporary self-contained toilet units for use by **Contractor's** personnel throughout the duration of abatement activities.

The **Contractor** shall install one functioning fire extinguisher in the work area for each 1,000 square feet of work area or part thereof. Additional fire extinguishers shall be installed in the Equipment Room and Clean Room of the decontamination unit.

The **Contractor** shall conduct a safety meeting for **Contractor's** employees with emphasis on operation of fire extinguishers and emergency exits in case of fire.

Contractor shall have posted emergency phone numbers for the fire department and police. **Contractor** shall store a minimum of volatile substances on the job site and in fire resistant

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containers only.

Contractor will furnish disposable suits, respirator filter cartridges and routing of water and GFCI-equipped electrical services for **Consultant's** use for the duration of the project.

Stop Work Order – The Owner or the Consultant may issue a verbal or written Stop Work Order when deemed necessary by the Owner or Consultant at any time during the abatement activities. When a Stop Work Order is issued, the Contractor will cease all activities requested, and shall not resume those activities until authorized by the Owner or Consultant.

V. Products

Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the **ACM** and retardation of fiber release during disturbance of the material. As an option, the **Contractor** may utilize water to which a mild detergent has been added in lieu of a commercially available surfactant product.

Disposal Bags: Provide as a minimum, individual, 6 mil thick, leak-tight, manufactured polyethylene bags.

Disposal Bag Labels: Provide labels with **Owner's** name, **Contractor's** name, Project site address and the following warnings and labels, in accordance with regulatory requirements. Labels shall be lettered with indelible ink.

First Label:

CAUTION
CONTAINS ASBESTOS FIBERS
AVOID OPENING OR BREAKING CONTAINER
BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH

Second Label: Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING AIRBORNE ASBESTOS, TREMOLITE, ANTHOPHYLLITE, OR
ACTINOLITE FIBERS IS HAZARDOUS TO YOUR HEALTH



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Third Label: Provide in accordance with U.S. Department of Transportation Regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances: Final Rule:

RQ HAZARDOUS
SUBSTANCE,
CLASS 9,
NA 2212, PG III
(ASBESTOS)

Polyethylene Wrap: Provide minimum 6 mil polyethylene sheeting as a wrapping for large sections of rigid waste material and for construction of floors and critical barriers in the containment areas. Provide minimum 4 mil polyethylene sheeting for construction of walls of the containment.

Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of **ACM**. Utilize an encapsulant that will meet or exceed the results produced by use of Amended Water, as described above.

Lockdown Encapsulant: Provide a tinted or untinted encapsulant designed specifically for lockdown of asbestos fibers.

Sprayer: Provide an airless-type sprayer suitable for the type and volume of work being performed. For small volume work, provide a hand pump type pressure-can sprayer fabricated out of either metal or plastic, equipped with a metal or plastic wand at the end of a hose that can deliver a stream or spray of liquid under pressure.

Mastic Remover/Solvent: Solvents with a flash point of 140 degrees Fahrenheit or below will not be used.

VI. Air Monitoring Services

The **Consultant** shall verify that the Work performed is in compliance with applicable regulations and that the building areas beyond the Work Area and the outside environment remain free of contamination. This section also sets forth airborne fiber levels both inside and outside the Work Area as action levels, and describes the action required by the **Contractor** if an action level is met or exceeded.

AIR MONITORING:

The **Consultant** will be conducting air monitoring throughout the course of the project.

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Base Line Fiber Counts: The **Consultant** will monitor airborne fiber counts prior to start of Work. The purpose of this air monitoring will be to establish existing airborne fiber counts prior to beginning abatement operations.

Work Area Isolation: The **Consultant** will monitor airborne fiber counts outside the Work Area. The purpose of this air monitoring will be to detect faults in the Work Area isolation including, but not limited to, contamination of the building outside of the Work Area with airborne asbestos fibers, failure of filtration or rupture in the ventilation system, or contamination of the exterior of the building with airborne asbestos fibers.

Should any of the above occur, the **Contractor** shall immediately cease asbestos abatement activities until the fault is corrected. Work shall not recommence until authorized by the **Consultant**.

Work Area Airborne Fiber Count: The **Consultant** will monitor airborne fiber counts in the Work Area. The purpose of this air monitoring will be to detect airborne fiber counts which may significantly challenge the integrity of Work Area isolation procedures that protect the balance of the building or outside of the building from contamination by airborne fibers.

Final Clearance: The **Consultant** will conduct Final Clearance air sampling in accordance with the Final Clearance Section of this Specification. Aggressive PCM clearance sampling will be conducted in accordance with the NIOSH 7400 Method A, in any contained area in which abatement has occurred.

AIRBORNE FIBER COUNTS:

Inside Work Area: Maintain an average airborne count in the Work Area of less than 0.2 fibers per cubic centimeter. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any Work shift or eight (8) hour period exceeds 0.2 fibers per cubic centimeter, stop Work and leave ventilation system in operation. Do not recommence Work until authorized by the **Consultant**.

Outside Work Area: Maintain an average airborne count outside the Work Area of less than or equal to Base Line.

If any air sample taken outside the Work Area exceeds the Base Line, immediately and automatically stop Work until the source of the high fiber readings can be determined by the **Consultant**. If no outside non-asbestos source can be located by the **Consultant** and if this air sample was taken inside the building and outside of Critical Barriers around the Work Area, immediately erect new Critical Barriers to isolate the affected area from the balance of the building or as instructed by the **Consultant**.

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Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor).

Decontaminate the affected area in accordance industry standard methods.

Respiratory protection as set forth in the Work Practices Section shall be worn in affected area until area is cleared for reoccupancy.

Leave Critical Barriers in place until completion of Work and insure that the operation of the negative pressure ventilation system in the Work Area results in a flow of air from the balance of the building into the affected area.

If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a new decontamination facility.

After visual inspection in the extended work area, remove Critical Barriers separating the work area from the affected area. Final Clearance air samples will be taken within the entire area.

Fiber Type Disputes: The following procedure will be used to resolve any disputes regarding fiber types when the Project has been stopped due to excessive airborne fiber counts:

Air samples will be secured in the same area by the **Consultant** for analysis by Transmission Electron Microscopy at the option of the **Consultant** and classified as retests and back charged to the **Contractor** in accordance with the procedures in this specification.

ANALYTICAL METHODS:

The following methods will be utilized at the discretion of the **Consultant** in collecting and analyzing air samples:

Phase Contrast Microscopy (NIOSH 7400 Method, Issue 2, Revision 3 or OSHA Reference Method)

Transmission Electron Microscopy (40 CFR Part 763, Subpart E, Appendix A)

SAMPLE PROTOCOLS:

General: The number and volume of air samples taken by the **Consultant** will generally be in accordance with the following schedule. Sample quantities, locations, volumes and methodologies may vary depending upon the analytical method, project layout, procedures used and at the discretion of the **Consultant**.

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SCHEDULE OF AIR SAMPLES:

Base Line Sample Schedule: The **Consultant** will secure the following air samples to establish a Base Line before start of Work. The number of samples may vary according to site plan and on authorization of **Consultant**.

Location Sampled	Minimum Number of Samples	Minimum Volume	Planned Analytical Method
Each Work Area	3	1250 Liters	PCM
Outside Each Work Area	1	1250 Liters	PCM
Outside Building	1	1250 Liters	PCM

Base Line Fiber Level: is an action level expressed in fibers per cubic centimeter which is the larger of either the average of the samples collected outside each work area or 0.01 fibers per cubic centimeter of air. The Base Line samples may be collected but archived (not read) at the discretion of the **CONSULTANT**.

Daily Sample Schedule (per 8-hour work period): The **Consultant** will generally take the following samples on a daily (8-hour work period) basis. The number of samples may vary according to site plan and on authorization of **Consultant**.

Location Sampled	Minimum Number of Samples	Minimum Volume	Planned Analytical Method
Each Work Area	2	500	PCM
Outside Each Work Area/Inside Building	2	500	PCM
Decon Clean Room	2	500	PCM

If airborne fiber counts exceed baseline limits, additional samples will be taken (and classified as retests) as necessary to monitor fiber levels and confirm sources.

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Work Area Final Clearance Schedule (per floor level / crawlspace completion): The **Consultant** will collect the following samples after completing a visual inspection of the work area. The number of samples may vary according to site plan and on authorization of **Consultant**.

Location Sampled	Minimum Number of Samples	Minimum Volume	Planned Analytical Method
Each Floor Level	5	1,250 Liters	PCM
Crawlspace	1	1,250 Liters	PCM

Release Criteria: Gross decontamination is complete when every Work Area sample is equal to or less than 0.01 fibers/cc. If any sample is above the limit indicated, then the gross decontamination is incomplete and recleaning by decontamination procedures and/or ventilation system cycling is required.

INSPECTIONS:

The **Consultant**, in addition to providing air monitoring services, will provide full-time, on-site inspection of Work activities. Work shall not proceed without prior notice to the **Consultant** and presence of the **Consultant** on the Work site (requires 48 hours' advance notice of Work).

The **Consultant** will conduct the following key Project inspections and no work by the **Contractor** will proceed beyond these points until all discrepancies noted during the inspection have been corrected.

The **Consultant's** inspections do not relieve the **Contractor** of Contract obligations and are not designed to locate all project discrepancies. The **Contractor** is responsible for project quality.

First Key Inspection:

Inspection of Work Area Prior to Start of Removal: Removal operations shall not proceed until the **Consultant** has completed inspection of the Work Area preparations and until all discrepancies noted have been corrected.

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Second Key Inspection:

Inspection During Removal: Removal Work shall not be conducted unless the **Consultant** is on the Project site. Daily inspection of the Work Area and Work practices will be conducted; upon discovery and report of a discrepancy the **Contractor** shall immediately stop Work and correct the discrepancy.

Third Key Inspection:

Inspection of Work Area After Completion of Removal Work, but Prior to Encapsulation and Work Area Disassembly: A visual inspection of the Work site areas and removal surfaces will be conducted at this point by the **Consultant** and encapsulation and/or regulated area disassembly shall not proceed until discrepancies noted have been corrected.

Fourth Key Inspection:

Final Clearance: After encapsulation and final clean-up of the Work Area, but prior to removal of regulated area tape and wet decontamination unit, the **Consultant** will conduct a visual inspection followed by final air tests. Final air sampling will be conducted in accordance with the Final Clearance Sections of this Specification.

Final Key Inspection:

Project Closeout Inspection: A final inspection will be conducted by the **Consultant** after the **Contractor** has removed regulated area tape, equipment, and supplies. A Project "Punch List" will be provided of any items requiring correction or completion. Punch List items shall be completed prior to issuance of final completion notice by the **Contractor**.

Discrepancies or needed corrective measures observed by the **Consultant** will be reported to the **Contractor's** Superintendent on-site and shall be immediately corrected.

The above inspections are not necessarily single events. Failed inspections will be re-conducted and time classified as retests and charged back to the **Contractor** in accordance with the project documents.

Inspections will require 24 hours' advance notice to the **Consultant**.

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PERSONAL MONITORING:

The **Contractor** may perform air monitoring as required to meet OSHA requirements for maintenance of Time Weighted Average (TWA) and excursion limit fiber counts for types of respiratory protection provided. The **Consultant** and/or **Owner** will not be providing air monitoring services to meet these OSHA requirements. A listing of all personal monitoring results obtained during the project will be submitted to the **Consultant** with the **Contractor** closeout submittals.

LABORATORY TESTING:

The **Consultant** will perform field analysis of the air samples. A microscope and field laboratory will be set up at the jobsite, at the option of the **Consultant**, so that verbal reports on air samples can be obtained promptly after collection.

Reports to the **Owner** by the **Consultant** will include air monitoring data and pertinent information on work being conducted such as: work hours, number of workers, procedures used, contractor discrepancies and corrective measures, containment methods and construction, and amount of **ACM** removed.

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Abatement General Locations

Asbestos Abatement Specifications

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Photographs

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Photo #1 Drywall construction walls/ceiling to be marked for removal by appropriate personnel.



Photo #2 Smoke alarm strobe to be marked for removal by appropriate personnel.



Photo #3 Smoke alarm to be marked for removal by appropriate personnel.



Photo #4 Smoke alarm strobe to be marked for removal by appropriate personnel.

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Photo #5 Pipe run bracket locations to be marked for installation by appropriate personnel.



Photo #6 Fire alarm to be marked for removal by appropriate personnel



Photo #7 Fire alarm pull station to be marked for removal by appropriate personnel.



Photo #8 Pipe run bracket locations to be marked for installation by appropriate personnel.

Asbestos Abatement Specifications

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Asbestos Inspection Report Information

Limited Asbestos and Lead-Containing Paint Survey Report

**FAIR AVENUE APARTMENTS
FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue
San Antonio, Texas**

January 31, 2018
Terracon Project No. 90177720



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

January 31, 2018



Mrs. Patti Keller, CTP
San Antonio Housing Authority
818 S. Flores Street
San Antonio, Texas 78204

Telephone: (210) 477-6170
Fax: (210) 477-6167
E-mail: patti_keller@saha.org

Re: Limited Asbestos & Lead-Containing Paint Survey Report
Fair Avenue Apartments, Fire Protection Improvements
1215 Fair Avenue
San Antonio, Texas 78223
Terracon Project No. 90177720

Dear Mrs. Keller:

The purpose of this report is to present the results of the limited asbestos and lead-containing paint survey performed on January 4 and January 5, 2018, at the above referenced site in San Antonio, Texas. This survey was conducted in general accordance with our proposal dated December 11, 2017. We understand that this survey was requested to identify and quantify asbestos-containing materials and lead-containing paint/coatings associated with wall and ceiling areas where renovations/installations are planned in the building.

Asbestos-containing moisture barrier and drywall construction materials were identified in various locations throughout the building. Two (2) of the nine (9) paint coatings sampled were found to contain quantities of lead considered lead-based paint. Please refer to the attached report for details.

Terracon appreciates the opportunity to provide this service to 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
Lead Risk Assessor
TDSHS Certificate No. 2071063

Inspected By:

Will C. DeVeau
TDSHS Individual Asbestos
Consultant
License No. 10-5734

Reviewed By:

Richard Ian Howes
TDSHS Individual Asbestos
Consultant
License No. 10-5406
Lead Inspector/Project Designer
Certificate No. 2060584/2090034

Terracon Consultants, Inc. 6911 Blanco Road, San Antonio, Texas 78216
P [210] 641-2112 F [210] 641-2124 terracon.com Texas Professional Engineers No. 3272

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APPENDIX A ASBESTOS SURVEY SAMPLE SUMMARY

APPENDIX B CONFIRMED ASBESTOS-CONTAINING MATERIALS

APPENDIX C ASBESTOS LABORATORY ANALYTICAL REPORT

APPENDIX D LEAD CONTAINING PAINT SAMPLE SUMMARY

APPENDIX E LEAD LABORATORY ANALYTICAL REPORT

APPENDIX F LEAD BASED PAINT XRF ANALYTICAL REPORT

APPENDIX G XRF PERFORMANCE CHARACTERISTIC SHEET

APPENDIX H LICENSES AND CERTIFICATIONS

**LIMITED ASBESTOS AND
LEAD-CONTAINING PAINT SURVEY REPORT
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS**

1215 Fair Avenue, San Antonio, Texas

Terracon Project No. 90177720

January 31, 2018

1.0 INTRODUCTION

Terracon conducted a limited asbestos-containing materials (ACM) survey and lead-containing paint (LCP) sampling of client selected units within the areas of the building scheduled for renovations at the Fair Avenue Apartments located at 1215 Fair Avenue in San Antonio, Texas. The survey was conducted on January 4 and January 5, 2018, by Texas Department of State Health Services (TDSHS) licensed and Environmental Protection Agency (EPA) accredited Asbestos Inspectors and a certified Lead Risk Assessor in general accordance with our proposal dated December 11, 2017.

Interior building components associated with the walls and ceiling areas where renovations/installations are planned 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 general accordance with the sampling protocols outlined in Environmental Protection Agency (EPA) regulation 40 CFR 763, The Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited and Texas Department of State Health Services (TDSHS) licensed laboratory for analysis by Polarized Light Microscopy (PLM) protocol.

The lead-containing paint sampling was conducted in general accordance with Texas Environmental Lead Reduction Rules (TELRR) and was intended to identify and assess the lead content of the materials which might be disturbed in the planned renovations/installations activities. An X-ray fluorescence (XRF) type analyzer was used to obtain direct readouts of lead content in coated surfaces associated with the building. XRF values are read and recorded in the field. Where XRF analyses resulted in readings below the standard set by TDSHS, EPA and HUD of 1.0 mg/cm², or exceptionally high concentrations of lead, the sample team randomly selected locations for collection of paint chip samples for laboratory confirmation. Samples of suspect LCP were delivered to an American Industrial Hygiene Association (AIHA) accredited laboratory for analysis utilizing Atomic Absorption Spectrometry (AAS Flame) methodology.

1.1 Project Objective

We understand that this survey was requested to identify and quantify asbestos-containing materials and lead-containing paint/coatings present in the building which may be disturbed by the planned fire protection installations. The study was primarily focused on wall and ceiling areas where renovations/installations are planned. The Texas Asbestos Health Protection Rules (TAHPR) and EPA regulation 40 CFR 61, Subpart M, The National Emission Standards for Hazardous Air Pollutants (NESHAP) requires that an asbestos survey be performed prior to renovation or demolition activities.

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.

The Department of Housing and Urban Development (HUD) guidelines consider a lead content equal to or greater than 5,000 parts per million (PPM) to be the level at which paint is considered to be “lead-based” and at which point a potential hazard exists. The Occupational Safety and Health Administration (OSHA) considers paint containing any level of lead above the analytical method detection limit a potential hazard which should be communicated to any employees or contractors who may disturb the materials in the course of their assigned work.

OSHA recognizes that HUD and the EPA find XRF analyzers acceptable for analyzing lead in paint at their clearance level of 1.0 mg/cm². They also recognize that some instruments can measure accurately at substantially lower levels. However, please be aware that while XRF analyzers may be an acceptable method of analysis for meeting HUD/EPA requirements, OSHA's concerns are different from those of HUD and EPA.

OSHA does not consider any method that relies solely on the analysis of bulk materials or surface content of lead (or other toxic material) to be acceptable for safely predicting employee exposure to airborne contaminants. Without air monitoring results or without the benefit of historical or objective data (including air sampling which clearly demonstrates that the employee cannot be exposed above the action level during any process, operation, or activity) the analysis of bulk or surface samples cannot be used to determine employee airborne exposure.

2.0 BUILDING DESCRIPTION

The building is an eleven-story, masonry/brick structure atop a concrete slab-on-grade foundation. The roof consists of a flat built-up membrane system. Interior walls consisted of a mixture of wood components, drywall construction, and concrete masonry unit (CMU) with a variety of painted and textured finishes. Ceilings in the public areas consisted primarily of acoustical tile systems. Ceilings in the units were observed to be drywall construction with painted and textured finishes. The floors in the majority of the units were finished with resilient floor tile. The bathrooms were finished with grouted ceramic tile.

3.0 FIELD ACTIVITIES

The survey was conducted by Mr. Will DeVeau; a TDSHS licensed and EPA accredited Individual Asbestos Consultant and Mr. Warren Dean; a TDSHS licensed and EPA accredited Asbestos Inspector and TDSHS certified Lead Risk Assessor employed by Terracon. Copies of each individual's licenses/certificates are attached as Appendix H. The asbestos 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). The lead testing was conducted in general accordance with Texas Environmental Lead Reduction Rules (TELRR). A summary of survey activities is provided below.

3.1 Visual Assessment

Our survey activities began with a visual observation of the interior areas described as being in the planned path of construction in the building 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. 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.

Suspect materials located within wall cavities and behind ceramic tile were not sampled in order to prevent excessive damage to the material. Suspect materials, such as vermiculite fill, mastic or other materials (i.e. overspray texturizers) which were not accessible on the day of the survey should be sampled prior to demolition or renovation activities if the activities will disturb the materials.

Terracon visually assessed interior areas of the building to identify painted/coated surfaces with suspect LCP. Painted/coated surfaces which appear similar throughout in terms of color, texture, substrate and date of application are treated as a homogeneous paint combination for paint chip collection purposes. Painted/coated surfaces were visually assessed for evidence of distress, flaking, chipping and/or peeling. The visual assessment included evaluating the condition of the building, condition of painted surfaces, dust accumulation in interior spaces, and painted components at impact or friction surfaces. The information gathered in the visual assessment was utilized in determining the collection points of LCP samples collected.

The LCP sampling was limited to readily observable and accessible surfaces. It should be noted that suspect lead-containing paint (LCP), other than those identified during the sampling, may exist within the building and/or on the building exterior. Materials which have not been specifically evaluated should be tested prior to disturbance of the material. If suspect LCP is identified during the demolition process, those materials should be assumed LCP until testing can be performed to determine if lead is present in the paint.

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.

A physical assessment of each painted/coated surface was conducted to assess its condition. The painted/coated surfaces were assessed to be in good, fair or poor condition depending on degree of cracking, flaking, chipping and/or peeling.

3.3 Sample Collection

Based on results of the visual observation, bulk samples of suspect ACM were collected in general accordance with AHERA and TAHPA 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.

Sixty-five (65) bulk samples were collected from thirteen (13) homogeneous areas of suspect ACM. A summary of suspect ACM samples collected during the survey is included as Appendix A.

Three hundred and ninety-five (395) XRF readings were collected along with nine (9) calibration readings as part of this study. Where XRF analyses resulted in readings below the standard set by TDSHS, EPA and HUD of 1.0 mg/cm², or exceptionally high concentrations of lead, the sample team randomly selected locations for collection of paint chip samples for laboratory confirmation. Seven (7) chip samples of suspect paint materials were collected in general

accordance with TELRR and HUD Guidelines. Each chip sample was placed in a sealable container and labeled with a unique sample number using an indelible marker. A summary of the suspect lead-containing samples collected during the survey is included as Appendix D.

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.

Bulk samples of the suspect lead-containing paint materials collected during the survey were analyzed by Environmental Hazards Services (EHS), L.L.C., an American Industrial Hygiene Association (AIHA) accredited laboratory utilizing Atomic Absorption Spectrometry (AAS Flame) methodology. Reports of laboratory analysis of the suspect lead-containing paint samples collected and sample chain-of-custody documentation are included in Appendix E.

3.5 LCP Methodology and Analysis

A Heuresis Pb200i XRF instrument was used to determine whether surface coatings contained lead-based paint. The building was evaluated to identify different testing combinations present. For the purposes of this survey and in the absence of published guidelines for testing commercial buildings, Terracon generally observed HUD Guidelines for testing housing; per these guidelines, individual tests are to be classified as part of a group based on the testing combination (room equivalent, component, and substrate). Substrates are classified as brick, masonry, concrete, drywall, metal, plaster, or wood. A component is defined as an item, such as doors, windows, walls, etc. When using testing combinations, LBP results are classified by summing the individual component test results of positive, negative, or inconclusive.

For more detailed information, including testing location, component, color, and substrate, refer to the XRF testing results contained in Appendix F.

No materials were assumed to be LBP. Any inaccessible areas that contain painted surfaces should be tested when access permits or should be assumed to be positive for LBP.

3.6 LCP Wall and Component Identification System

Wall sides were identified with letters A, B, C and D. Side A is the north side. Sides B, C, and D are identified clockwise, starting from the "3 o'clock" position from Side A as one faces north; thus, Side B is to the right, Side C is across from Side A, and Side D is to the left of Side A.

3.7 XRF Instrumentation

The Heuresis Pb200i XRF instrument (Serial No. 1570; Reference Date: June 15, 2017) was used in the testing for lead based paint for this project. During the inspection, the standard set by TDSHS, EPA and HUD of 1.0 mg/cm² was followed to determine the components that contained LBP.

The calibration of the Heuresis Pb200i XRF instrument was done in accordance with the Performance Characteristic Sheet (PCS). The Heuresis Pb200i XRF instrument was calibrated using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM).

Using protocols provided by HUD and the instrument manufacturer and in accordance with NIST reference standard, calibration checks are performed at least twice daily, once prior to the inspection and once immediately after the inspection and every four hours in-between. If for any reason the Heuresis Pbi200 XRF instrument is not maintaining a consistent calibration reading within the manufacturer's standards for performance on the calibration sheet supplied by the manufacturer, manufacturer's recommendations are used to bring the instrument into calibration. If the instrument cannot be brought back into calibration, the instrument will be returned to the manufacturer for repair and/or re-calibration. The PCS is located in Appendix G.

An XRF reading above the standard of 1.0 mg/cm² of lead is considered positive for the presence of lead-based paint; however, while a reading below 1.0 mg/cm² is considered negative for the presence of lead-based paint, disturbance of the material could still create harmful conditions if proper precautions are not taken during activities that disturb these paint combinations

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 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. States that administer their own federally approved state OSHA programs may require other precautions.

The State of Texas has established the Texas Environmental Lead Reduction Rules (TELRR) Texas Administrative Code (TAC), Title 25, Part 1, Chapter I, Subchapter 295 to establish the means to control and minimize public exposure to lead by regulating lead-based paint activities in target housing and child-occupied facilities. The TELRR contains procedures and requirements for the accreditation of lead training providers, procedures and requirements for the certification of individuals and firms engaged in lead-based paint activities and standards for performing such activities in target housing and child-occupied facilities. The TELRR requires that all lead-based paint activities in target housing and child-occupied facilities be performed by certified individuals. Regulatory agencies (HUD, TDSHS) have defined LBP as a paint or other surface coating that contain equal to or greater than $\geq 5,000$ parts per million (ppm) of lead or more than 0.5% of lead by weight for buildings that meet the definition of target housing. The Occupational Safety and Health Administration (OSHA) define LBP as a paint which contains lead, regardless of the concentration.

The OSHA Lead Standard for Construction (29 CFR 1926.62) applies to construction work where an employee may be occupationally exposed to lead. All work related to construction, alteration, or repair (including painting and decorating) is included. The lead-in-construction standard applies to any detectable concentration of lead in paint. OSHA considers paint containing any level of lead above the analytical method detection limit a potential hazard which should be communicated to any employees or contractors who may disturb the materials in the course of their assigned work.

5.0 FINDINGS AND RECOMMENDATIONS

Five (5) of the homogeneous materials sampled and analyzed as part of this survey were found to contain asbestos.

- Drywall Construction – The tan drywall construction materials with a rough bumpy texture utilized as the walls in the Corridors and ceilings in Laundry Rooms (1st Floor through 11th Floors), walls and ceilings in 1st Floor File Room, and walls in 1st Floor Laundry Room were found to contain 3% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the scope of the asbestos survey, total quantities of ACM materials located in the building are undetermined.
- Drywall Construction – The white drywall construction materials with a flat texture utilized as the ceilings in the Janitor’s Closets (1st Floor through 11th Floor) were found to contain 3% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the scope of the asbestos survey, total quantities of ACM materials located in the building are undetermined.
- Drywall Construction – The light yellow drywall construction materials with an orange peel texture utilized as the walls throughout the units (1st Floor through 11th Floor) were found to contain 2% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the scope of the asbestos survey, total quantities of ACM materials located in the building are undetermined.
- Drywall Construction – The white drywall construction materials with a light orange peel texture utilized as the ceilings throughout the units (1st Floor through 11th Floor) were found to contain 2% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the scope of the asbestos survey, total quantities of ACM materials located in the building are undetermined.

- Moisture Barrier – The black moisture barrier materials utilized on various Crawlspace walls adjacent to the 1st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement were found to contain 2% Chrysotile asbestos. The asbestos-containing drywall construction materials identified were noted to be in a good condition and were assessed as being non-friable. Due to the scope of the asbestos survey, total quantities of ACM materials located in the building are undetermined.

None of the other suspect building materials associated with wall and ceiling areas which are in the path of construction that were sampled and analyzed were found to contain asbestos.

It should be noted that suspect materials, other than those identified during the January 4, 2018, 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 any of 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 building 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.

Analysis using the XRF unit indicated two (2) paint testing combinations exceeded the unit's analytical detection of 1.0 mg/cm² and are considered "Lead-Based-Paint" by HUD:

- T-L08 – The green paint material applied to the walls in the 1st Floor Corridor Restrooms (east) were found to contain 1.0 to 1.1 mg/cm² lead. Where observed, this material was found to be in good condition.
- T-L09 – The tan paint material applied to the walls in the 1st Floor Corridor Restrooms (except east) were found to contain 1.0 to 1.3 mg/cm² lead. Where observed, this material was found to be in good condition.

The majority of the XRF readings indicated paint which by this testing method are not lead-based paint. No readings were measured as inconclusive. The possibility exists that LBP coated surfaces may be hidden from sight or in inaccessible locations, or the homogeneous construction areas identified may not be homogeneous.

Seven (7) of the seven (7) paint/coating chips sampled and analyzed as part of this survey were found to contain lead in concentrations below the detection limit and would be considered by OSHA to present no workforce hazard.

- T-L01 – The green paint material applied to the walls in the Main Office hallway (west, south), Reception Office (south), Community Center Restroom hallway (southwest portion, west), Community Center Restrooms (south), Community Center (west), Mailbox Area wall, Resident Center (east, west), and the Corridor at Resident Center (south) were found to contain <36 ppm lead. Where observed, this material was found to be in good condition.
- T-L02 – The tan paint material applied to walls in select units, the Main Office hallway (north, east), Reception Office (north, east), Office #113, #112 (except north), #108, #109, (except east), #115, Office Server Room, Community Center Restroom Hallway (north, southeast portion), Community Center (north, east, south), Community Center Fur-downs, Community Center Kitchen, Resident Center (north, south), main Corridors, and Walls and ceilings in the Community Center Restrooms (except south wall) were found to contain <41 ppm lead. Where observed, this material was found to be in good condition.
- T-L03 – The white paint material applied to the walls and ceilings in the Janitors Closets and ceilings in select units were found to contain <45 ppm lead. Where observed, this material was found to be in good condition.

- T-L04 – The light gray paint material applied to the floors in the 1st Floor stairwells and basement were found to contain <42 ppm lead. Where observed, this material was found to be in good condition.
- T-L05 – The yellow paint material applied to the walls in select units were found to contain <47 ppm lead. Where observed, this material was found to be in good condition.
- T-L06 – The off-white paint material applied to the walls and ceilings in the Laundry Rooms found to contain <37 ppm lead. Where observed, this material was found to be in good condition.
- T-L07 – The purple paint material applied to the accent walls in select units were found to contain <38 ppm lead. Where observed, this material was found to be in good condition.

Laboratory analytical reports are included in Appendix D. The XRF testing results are contained in Appendix F.

In areas where the Client does not intend to renovate or demolish the building, the lead-based/lead-containing paint materials, which will remain in the building, should be managed in place. It is recommended that this in-place management should include such operations as stabilizing or repairing any damaged materials, protecting the remaining lead-containing paint materials from further damage, and developing a plan to periodically monitor the condition of the lead-based/lead-containing paint materials. Notification of the presence of the materials should also be made to employees and outside contractors so that they do not inadvertently disturb the remaining paint materials.

Any project which would disturb the lead-based/lead-containing materials within the facility is to be conducted, it is recommended that contracting personnel who may disturb the lead-based/lead-containing paint materials within the facility be made aware of the lead content in the materials so that they may exercise proper OSHA procedures for personnel protection or possibly employ protective procedures when working with the coatings.

Planned renovation/demolition activities impacting those materials determined to contain measurable concentrations of lead will be subject to OSHA regulations (29 CFR 1926.62 – Lead Exposure in Construction). The OSHA regulation defines specific training requirements, engineering controls and working practices for construction personnel subject to this standard. There are also federal and state regulations, which require characterization of demolition debris to determine the proper disposal procedures.

Construction work covered by 29 CFR 1926.62 includes any repair, renovation, or other activities that disturb in-place, lead-containing materials, but does not include routine cleaning and repainting where there is insignificant damage, wear, or corrosion of existing lead-containing

coatings or substrates. Employers must assure that no employee will be exposed to lead at concentrations greater than the PEL of 50 micrograms per cubic meter (mg/m^3) averaged over an eight-hour period without adequate protection. The OSHA standard also establishes an action level of $30 \text{ mg}/\text{m}^3$, which if exceeded, triggers certain requirements, including periodic exposure monitoring and medical monitoring. Terracon recommends personnel air sampling of workers that perform work on surfaces with lead-containing paint. Personnel sampling should be performed in compliance with OSHA regulations. As it is understood a demolition project which would disturb the lead-based/lead-containing materials on the building is to be conducted, it is recommended that contracting personnel who may disturb the lead-based/lead-containing paint materials associated with the building be made aware of the lead content in the materials so that they may exercise proper OSHA procedures for personnel protection or possibly employ protective procedures when working with the coatings.

Compliance with applicable OSHA lead regulations is the responsibility of the contractor performing the work and it is recommended that they be required to communicate potential lead hazards to their workforce and utilize lead-safe work practices such as outlined in the EPA Renovation, Repair, and Painting (RRP) Final Rule (40 CFR 745) or applicable portions of the Structural Steel Painting Council (SSPC) Guidelines. It is further recommended that activities such as flame/torch dismantling, dry sanding and/or dry grinding of any components with lead-containing materials applied should be prohibited as part of any repair, renovation or demolition activity.

It is recommended that any painted metal components which are to be removed from the building be segregated from the waste stream and be transferred to a suitable metal recycling facility.

It is our understanding that the building is occupied by seniors and as such is not considered Target Housing, HUD and TDSHS lead regulations do not apply to removal operations associated with the building. It is, however, recommended that they be consulted as a general guideline for employee/worker protection and that OSHA notification be made to all employees or contractors working on any repair, renovation or demolition projects associated with the building.

The EPA Resource Conservation and Recovery Act (RCRA) regulations set the limit of leachable lead in lead containing waste at 5.0 milligrams per liter (mg/L). Leachable lead means the amount of lead likely to leach from the waste into the surrounding soil of a landfill. This level is established by an analytical method called the toxicity characteristic leaching procedure (TCLP). Lead-containing waste that equals or exceeds the RCRA limit must be managed in accordance with RCRA regulations. This regulation affects the disposal of demolition or remodel debris containing lead or lead based paint.

6.0 GENERAL COMMENTS

This asbestos survey and lead-containing paint sampling 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 building. 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. 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
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-01	Drywall Construction – Tan and Green with a Heavy Splatter Texture	Utilized as the renovation area walls in the Main Office, Work area, Community Room, and walls and ceilings in Restrooms 104, 105, 117 and 120	Office 113 – Southeast	No Asbestos Detected
F-02	Drywall Construction – Tan and Green with a Heavy Splatter Texture	Utilized as the renovation area walls in the Main Office, Work area, Community Room, and walls and ceilings in Restrooms 104, 105, 117 and 120	Office 108 – Southwest	No Asbestos Detected
F-03	Drywall Construction – Tan and Green with a Heavy Splatter Texture	Utilized as the renovation area walls in the Main Office, Work area, Community Room, and walls and ceilings in Restrooms 104, 105, 117 and 120	Work Area 101 – East	No Asbestos Detected
F-04	Suspended Acoustical Ceiling Tile - 2' x 2', White with Small Pinholes	Utilized as the renovation area ceiling in the Community Room, Main Office, Resident Center, and Corridors (east and north) of the Resident Center.	Office 109 - West	No Asbestos Detected
F-05	Suspended Acoustical Ceiling Tile - 2' x 2', White with Small Pinholes	Utilized as the renovation area ceiling in the Community Room, Main Office, Resident Center, and Corridors (east and north) of the Resident Center.	Community Room - East	No Asbestos Detected
F-06	Suspended Acoustical Ceiling Tile - 2' x 2', White with Small Pinholes	Utilized as the renovation area ceiling in the Community Room, Main Office, Resident Center, and Corridors (east and north) of the Resident Center.	Corridor West of Front Office - West	No Asbestos Detected
F-07	HVAC Duct Mastic – White	Utilized on HVAC ducts in the 1 st Floor renovation areas	Work Area 101-Central	No Asbestos Detected
F-08	HVAC Duct Mastic – White	Utilized on HVAC ducts in the 1 st Floor renovation areas	Office 109 – West	No Asbestos Detected
F-09	HVAC Duct Mastic – White	Utilized on HVAC ducts in the 1 st Floor renovation areas	Community Room Hallway – East	No Asbestos Detected

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SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-10	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	1 st Floor North Corridor at North Stairwell	3% Chrysotile
F-11	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	2 nd Floor West Corridor at Exit Stairwell	3% Chrysotile
F-12	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	3 rd Floor Janitor’s Closet – East	3% Chrysotile
F-13	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	4 th Floor North Hallway – East	3% Chrysotile
F-14	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	5 th Floor East Hallway at Entry	3% Chrysotile
F-15	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	6 th Floor South Hallway at Stairwell	3% Chrysotile
F-16	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	7 th Floor South Corridor – West	3% Chrysotile

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SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-17	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	8 th Floor East Corridor at Entry	3% Chrysotile
F-18	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	9 th Floor South Corridor – East	3% Chrysotile
F-19	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	10 th Floor East Corridor at Janitor Entry	3% Chrysotile
F-20	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	11 th Floor East Corridor – North	3% Chrysotile
F-21	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Horizontal Fissures	Utilized as the original ceiling throughout Corridors (1 st Floor- 11 th Floor)	1 st Floor West Corridor – West	No Asbestos Detected
F-22	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Horizontal Fissures	Utilized as the original ceiling throughout Corridors (1 st Floor- 11 th Floor)	3 rd Floor West Corridor – Entry	No Asbestos Detected
F-23	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Horizontal Fissures	Utilized as the original ceiling throughout Corridors (1 st Floor- 11 th Floor)	7 th Floor East Corridor – Central	No Asbestos Detected

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SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-24	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Fissures	Utilized as replacement ceiling throughout Corridors (1 st Floor- 11 th Floor)	1 st Floor North Corridor – Central	No Asbestos Detected
F-25	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Fissures	Utilized as replacement ceiling throughout Corridors (1 st Floor- 11 th Floor)	4 th Floor West Hallway – Entry	No Asbestos Detected
F-26	Suspended Acoustical Ceiling Tile - 2' x 4', White with Pinholes and Fissures	Utilized as replacement ceiling throughout Corridors (1 st Floor- 11 th Floor)	8 th Floor West Corridor – West	No Asbestos Detected
F-27	Drywall Construction – White with a Flat Texture	Utilized as the ceilings in the Janitor's Closets (1 st Floor through 11 th Floor)	1 st Floor Janitor's Closet – Southeast	3% Chrysotile
F-28	Drywall Construction – White with a Flat Texture	Utilized as the ceilings in the Janitor's Closets (1 st Floor through 11 th Floor)	3 rd Floor Janitor's Closet – Southeast	3% Chrysotile
F-29	Drywall Construction – White with a Flat Texture	Utilized as the ceilings in the Janitor's Closets (1 st Floor through 11 th Floor)	7 th Floor Janitor's Closet – East	3% Chrysotile
F-30	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 104, Living Room Closet – Northeast	No Asbestos Detected
F-31	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 215, Bedroom Closet – Southeast	No Asbestos Detected
F-32	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 302, Kitchen – Northwest	No Asbestos Detected
F-33	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 411, Kitchen – North	No Asbestos Detected

APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-34	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 504, Closet – Northwest	No Asbestos Detected
F-35	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 618, Pantry – Northeast	2% Chrysotile
F-36	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 707, Living Room Closet – Northeast	2% Chrysotile
F-37	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 812, Kitchen – Southwest	2% Chrysotile
F-38	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 908, Kitchen – Southwest	2% Chrysotile
F-39	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 1013, Kitchen – Southwest	2% Chrysotile
F-40	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	Unit 1107, Bedroom – Southwest	2% Chrysotile
F-41	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 104, Bedroom Closet – Southeast	No Asbestos Detected
F-42	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 215, Bathroom – Southeast	2% Chrysotile
F-43	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 302, Bathroom Ceiling - Northeast	2% Chrysotile
F-44	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 411, Entry - Southeast	No Asbestos Detected

APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-45	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 504, Restroom – At Entry	2% Chrysotile
F-46	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 618, Kitchen	2% Chrysotile
F-47	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 707, Kitchen - Southwest	2% Chrysotile
F-48	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 812, Kitchen - Northeast	2% Chrysotile
F-49	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 908, Bedroom Closet - Northwest	2% Chrysotile
F-50	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 1013, Bedroom Closet - Northwest	2% Chrysotile
F-51	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	Unit 1109, Kitchen - North	2% Chrysotile
F-52	CMU Texture – Yellow with a Light Texture	Utilized as the walls in the Laundry Rooms (2 nd Floor through 11 th Floor)	2nd Floor Laundry Room – Southwest	No Asbestos Detected
F-53	CMU Texture – Yellow with a Light Texture	Utilized as the walls in the Laundry Rooms (2 nd Floor through 11 th Floor)	3 rd Floor Laundry Room – North	No Asbestos Detected
F-54	CMU Texture – Yellow with a Light Texture	Utilized as the walls in the Laundry Rooms (2 nd Floor through 11 th Floor)	4 th Floor Laundry Room – South	No Asbestos Detected
F-55	CMU Texture – Yellow with a Light Texture	Utilized as the walls in the Laundry Rooms (2 nd Floor through 11 th Floor)	6 th Floor Laundry Room – North	No Asbestos Detected
F-56	CMU Texture – Yellow with a Light Texture	Utilized as the walls in the Laundry Rooms (2 nd Floor through 11 th Floor)	8 th Floor Laundry Room – East	No Asbestos Detected

APPENDIX A
ASBESTOS SURVEY SAMPLE SUMMARY
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NUMBER	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	SAMPLE LOCATION	LAB RESULTS
F-57	Drywall Construction – Tape and Float Only	Utilized as the walls (east and central) in Elevator Machine Room	East Wall - South	No Asbestos Detected
F-58	Drywall Construction – Tape and Float Only	Utilized as the walls (east and central) in Elevator Machine Room	East Wall - Central	No Asbestos Detected
F-59	Drywall Construction – Tape and Float Only	Utilized as the walls (east and central) in Elevator Machine Room	East Wall - North	No Asbestos Detected
F-60	Drywall – White with a Flat Texture	Utilized as the walls and ceilings of the Basement Cargo Elevator Control Room	Control Room - Northeast	No Asbestos Detected
F-61	Drywall – White with a Flat Texture	Utilized as the walls and ceilings of the Basement Cargo Elevator Control Room	Control Room - Northwest	No Asbestos Detected
F-62	Drywall – White with a Flat Texture	Utilized as the walls and ceilings of the Basement Cargo Elevator Control Room	Control Room - Southwest	No Asbestos Detected
F-63	Moisture Barrier - Black	Utilized on various Crawlspace walls adjacent to the 1 st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement	Crawlspace adjacent to the 1 st Floor Office Corridor (north portion)	No Asbestos Detected
F-64	Moisture Barrier - Black	Utilized on various Crawlspace walls adjacent to the 1 st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement	Crawlspace adjacent to the 1 st Floor Office Corridor (north portion)	No Asbestos Detected
F-65	Moisture Barrier - Black	Utilized on various Crawlspace walls adjacent to the 1 st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement	Crawlspace adjacent to Central Stairwell	10% Chrysotile

APPENDIX B

CONFIRMED ASBESTOS-CONTAINING MATERIALS

APPENDIX B
CONFIRMED ASBESTOS-CONTAINING MATERIALS
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NO.	MATERIAL DESCRIPTION	HOMOGENEOUS AREA	PERCENT / TYPE ASBESTOS	NESHAP CLASSIFICATION	MATERIAL CONDITION	ESTIMATED QUANTITY
F-10, 11, 12, 13, 14, 15, 16, 17, 18, 19, & 20	Drywall Construction – Tan with a Rough Bumpy Texture	Utilized as the walls in the Corridors and ceilings in Laundry Rooms (1 st Floor through 11 th Floors), walls and ceilings in 1 st Floor File Room, and walls in 1 st Floor Laundry Room	3% Chrysotile	RACM	Good	*Undetermined
F-27, 28, & 29	Drywall Construction – White with a Flat Texture	Utilized as the ceilings in the Janitor’s Closets (1 st Floor through 11 th Floor)	3% Chrysotile	RACM	Good	*Undetermined
F-30, 31, 32, 33, 34, 35, 36, 37, 38, 39, & 40	Drywall Construction – Light Yellow with an Orange Peel Texture	Utilized as the walls throughout the units (1 st Floor through 11 th Floor)	2% Chrysotile	RACM	Good	*Undetermined
F-41, 42, 43, 44, 45, 46, 47, 48, 49, 50, & 51	Drywall Construction – White with a Light Orange Peel Texture	Utilized as the ceilings throughout the units (1 st Floor through 11 th Floor)	2% Chrysotile	RACM	Good	*Undetermined
F-63, 64, & 65	Moisture Barrier - Black	Utilized on various Crawlspace walls adjacent to the 1 st Floor Office Corridor (north portion), the Central Stairwell, and the northeast portion adjacent to the Basement	10% Chrysotile	Category II Non-Friable	Good	*Undetermined

* Due to the scope of the asbestos survey, total quantities of ACM materials located in the facility are undetermined.

Sq. Ft. = Square Feet

Lin. Ft. = Linear Feet

APPENDIX B
CONFIRMED ASBESTOS-CONTAINING MATERIALS
VACANT RESIDENCE
1021 EL PASO STREET
SAN ANTONIO, TEXAS
Terracon Project No. 90177733

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 LABORATORY ANALYTICAL REPORT

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: Will DeVeau

Client Project Number: 90177720

Lab Project #: 226950

Client Sample Number	Lab Sample Number	Asbestos Type and %	Asbestos Content by Layer		
F - 1	738177	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 2	738178	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 3	738179	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 4	738180	NAD			
F - 5	738181	NAD			
F - 6	738182	NAD			
F - 7	738183	NAD			
F - 8	738184	NAD			
F - 9	738185	NAD			
F - 10	738186	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 11	738187	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 12	738188	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 13	738189	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 14	738190	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 15	738191	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 16	738192	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 17	738193	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 18	738194	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 19	738195	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 20	738196	Chry <1%	3% Chrysotile detected in Texturizer 3% Chrysotile detected in Joint Compound NAD detected in Drywall	3% Chrysotile detected in Joint Compound	NAD
F - 21	738197	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: Will DeVeau

Client Project Number: 90177720

Lab Project #: 226950

Client Sample Number	Lab Sample Number	Asbestos Type and %	Asbestos Content by Layer		
F - 22	738198	NAD			
F - 23	738199	NAD			
F - 24	738200	NAD			
F - 25	738201	NAD			
F - 26	738202	NAD			
F - 27	738203	Chry <1%	3% Chrysotile detected in Texturizer	NAD detected in Drywall	
F - 28	738204	Chry <1%	3% Chrysotile detected in Texturizer	NAD detected in Drywall	
F - 29	738205	Chry <1%	3% Chrysotile detected in Texturizer	NAD detected in Drywall	
F - 30	738206	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 31	738207	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 32	738208	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 33	738209	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 34	738210	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 35	738211	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 36	738212	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 37	738213	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 38	738214	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 39	738215	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 40	738216	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	NAD detected in Drywall
F - 41	738217	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 42	738218	Chry <1%	2% Chrysotile detected in Texturizer	2% Chrysotile detected in Joint Compound	2% Chrysotile detected in Joint Compound NAD detected in Drywall

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: Will DeVeau

Client Project Number: 90177720

Lab Project #: 226950

Client Sample Number	Lab Sample Number	Asbestos Type and %	Asbestos Content by Layer		
F - 43	738219	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 44	738220	NAD	NAD detected in Texturizer	NAD detected in Joint Compound	NAD detected in Drywall
F - 45	738221	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 46	738222	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 47	738223	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 48	738224	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 49	738225	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 50	738226	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 51	738227	Chry <1%	2% Chrysotile detected in Texturizer 2% Chrysotile detected in Joint Compound NAD detected in Drywall		
F - 52	738228	NAD			
F - 53	738229	NAD			
F - 54	738230	NAD			
F - 55	738231	NAD			
F - 56	738232	NAD			
F - 57	738233	NAD	NAD detected in Texturizer	NAD detected in Drywall	
F - 58	738234	NAD	NAD detected in Texturizer	NAD detected in Drywall	
F - 59	738235	NAD	NAD detected in Texturizer	NAD detected in Drywall	
F - 60	738236	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 61	738237	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 62	738238	NAD	NAD detected in Texturizer detected in Drywall	NAD detected in Joint Compound	NAD
F - 63	738239	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: Will DeVeau

Client Project Number: 90177720

Lab Project #: 226950

<u>Client Sample Number</u>	<u>Lab Sample Number</u>	<u>Asbestos Type and %</u>	<u>Asbestos Content by Layer</u>
F - 64	738240	NAD	
F - 65	738241	Chry 10%	

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

January 12, 2018

Will DeVeau

Terracon Consultants, Inc. San Antonio

6911 Blanco Road

San Antonio, TX 78216

Dear Mr DeVeau:

Please find enclosed the bulk sample analytical results for the following project:

Client Project #:	90177720	Lab Project #:	226950
Date Received:	1/8/2018	Received By:	Steve Griffin
Delivery Agency:	Federal Express	Name/Tracking #:	682235357405
Date Logged:	1/9/2018	Logged in by:	Steve Griffin
Analysis Completed:	1/12/2018	Samples in Project:	65

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%.

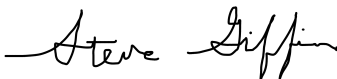
Negative results of resinously bound materials such as roofing material or floor tile may be inconclusive. NAD means No Asbestos was Detected in the sample or layer. The term texturizer (where applicable) may include wall texturizing, tape and bed, and/or joint compound. This report relates only to the 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 #: 226950 Lab Sample #: 738177 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 1 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738178 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 2 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738179 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 3 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950
Client Project #: 90177720
Client Sample #: F - 4
Analyst: Steve Griffin
Comments:

Lab Sample #: 738180

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 30 %

Fibrous Total: 70 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 20 %

Non-Fibrous Total: 30 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 5
Analyst: Steve Griffin
Comments:

Lab Sample #: 738181

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 30 %

Fibrous Total: 70 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 20 %

Non-Fibrous Total: 30 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 6
Analyst: Steve Griffin
Comments:

Lab Sample #: 738182

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 30 %

Fibrous Total: 70 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 20 %

Non-Fibrous Total: 30 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 7
Analyst: Steve Griffin
Comments:

Lab Sample #: 738183

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 25 %
Fibrous Glass 25 %

Fibrous Total: 50 %

NON-FIBROUS COMPONENTS

Filler/Binder
Mastic 25 %
Metal 25 %

Non-Fibrous Total: 50 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 8
Analyst: Steve Griffin
Comments:

Lab Sample #: 738184

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/11/2018
QC'd By: Steve Griffin

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 25 %
Fibrous Glass 25 %

Fibrous Total: 50 %

NON-FIBROUS COMPONENTS

Filler/Binder
Mastic 25 %
Metal 25 %

Non-Fibrous Total: 50 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 9
Analyst: Steve Griffin
Comments:

Lab Sample #: 738185

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 25 %
Fibrous Glass 25 %

Fibrous Total: 50 %

NON-FIBROUS COMPONENTS

Filler/Binder
Mastic 25 %
Metal 25 %

Non-Fibrous Total: 50 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738186 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 10 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738187 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 11 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738188 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 12 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738189 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 13 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738190 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 14 Date Analyzed: 1/11/2018
Analyst: Steve Griffin QC'd By: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738191 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 15 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738192 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 16 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738193 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 17 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738194 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 18 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738195 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 19 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738196 Color: Tan
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 20 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: 3% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738197 Color: Gray
Client Project #: 90177720 Characterization: Homogeneous, Fibrous
Client Sample #: F - 21 Date Analyzed: 1/11/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	8 %
Amosite		Mineral Wool	40 %	Paint	2 %
Crocidolite				Perlite	10 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	80 %	Non-Fibrous Total:	20 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 22
Analyst: Steve Griffin
Comments:

Lab Sample #: 738198

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 40 %

Fibrous Total: 80 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 10 %

Non-Fibrous Total: 20 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 23
Analyst: Steve Griffin
Comments:

Lab Sample #: 738199

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 40 %

Fibrous Total: 80 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 10 %

Non-Fibrous Total: 20 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 24
Analyst: Steve Griffin
Comments:

Lab Sample #: 738200

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

ASBESTOS COMPONENTS

Chrysotile
Amosite
Crocidolite
Tremolite
Actinolite
Anthophyllite

Asbestos Total: NAD

FIBROUS COMPONENTS

Cellulose 40 %
Mineral Wool 30 %

Fibrous Total: 70 %

NON-FIBROUS COMPONENTS

Filler/Binder 8 %
Paint 2 %
Perlite 20 %

Non-Fibrous Total: 30 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 25
Analyst: Steve Griffin
Comments:

Lab Sample #: 738201

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	8 %
Amosite		Mineral Wool	30 %	Paint	2 %
Crocidolite				Perlite	20 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	70 %	Non-Fibrous Total:	30 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 26
Analyst: Steve Griffin
Comments:

Lab Sample #: 738202

Color: Gray
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/11/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	40 %	Filler/Binder	8 %
Amosite		Mineral Wool	30 %	Paint	2 %
Crocidolite				Perlite	20 %
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	70 %	Non-Fibrous Total:	30 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 27
Analyst: Steve Griffin
Comments:

Lab Sample #: 738203

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738204 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 28 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738205 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 29 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 3% Chrysotile detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738206 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 30 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950
Client Project #: 90177720
Client Sample #: F - 31
Analyst: Steve Griffin
Comments:

Lab Sample #: 738207

Color: Yellow
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018
QC'd By: Steve Griffin

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950
Client Project #: 90177720
Client Sample #: F - 32
Analyst: Steve Griffin
Comments:

Lab Sample #: 738208

Color: Yellow
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950
Client Project #: 90177720
Client Sample #: F - 33
Analyst: Steve Griffin
Comments:

Lab Sample #: 738209

Color: Yellow
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738210 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 34 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738211 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 35 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738212 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 36 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738213 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 37 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	40 %	Non-Fibrous Total:	60 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738214 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 38 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738215 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 39 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738216 Color: Yellow
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 40 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738217 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 41 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738218 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 42 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound. Layer 4: No Asbestos Detected in Drywall.
Layer 3: 2% Chrysotile detected in Joint Compound.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738219 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 43 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound. Layer 4: No Asbestos Detected in Drywall.
Layer 3: 2% Chrysotile detected in Joint Compound.

Lab Project #: 226950 Lab Sample #: 738220 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 44 Date Analyzed: 1/12/2018
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	50 %
Amosite		Fibrous Glass	10 %	Paint	10 %
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 #: 226950 Lab Sample #: 738221 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 45 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738222 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 46 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738223 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 47 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738224 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 48 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738225 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 49 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738226 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 50 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

Lab Project #: 226950 Lab Sample #: 738227 Color: White
Client Project #: 90177720 Characterization: Heterogeneous, Fibrous
Client Sample #: F - 51 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile	<1 %	Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	<1 %	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: 2% Chrysotile detected in Texturizer.
Layer 2: 2% Chrysotile detected in Joint Compound.
Layer 3: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738228 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Non-Fibrous
Client Sample #: F - 52 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 5 %
Amosite		Paint 95 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226950 Lab Sample #: 738229 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Non-Fibrous
Client Sample #: F - 53 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 5 %
Amosite		Paint 95 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226950 Lab Sample #: 738230 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Non-Fibrous
Client Sample #: F - 54 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 5 %
Amosite		Paint 95 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950 Lab Sample #: 738231 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Non-Fibrous
Client Sample #: F - 55 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 5 %
Amosite		Paint 95 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226950 Lab Sample #: 738232 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Non-Fibrous
Client Sample #: F - 56 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile		Filler/Binder 5 %
Amosite		Paint 95 %
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total:	Non-Fibrous Total: 100 %

SAMPLE LAYER DETAILS

Lab Project #: 226950 Lab Sample #: 738233 Color: White
Client Project #: 90177720 Characterization: Homogeneous, Fibrous
Client Sample #: F - 57 Date Analyzed: 1/12/2018
Analyst: Steve Griffin
Comments:

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Cellulose 30 %	Filler/Binder 70 %
Amosite		
Crocidolite		
Tremolite		
Actinolite		
Anthophyllite		
Asbestos Total: NAD	Fibrous Total: 30 %	Non-Fibrous Total: 70 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 58
Analyst: Steve Griffin
Comments:

Lab Sample #: 738234

Color: White
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/12/2018
QC'd By: Steve Griffin

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	70 %
Amosite					
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 59
Analyst: Steve Griffin
Comments:

Lab Sample #: 738235

Color: White
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	70 %
Amosite					
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

SAMPLE LAYER DETAILS

Layer 1: No Asbestos Detected in Texturizer.
Layer 2: No Asbestos Detected in Drywall.

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 60
Analyst: Steve Griffin
Comments:

Lab Sample #: 738236

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

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 #: 226950
Client Project #: 90177720
Client Sample #: F - 61
Analyst: Steve Griffin
Comments:

Lab Sample #: 738237

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018
QC'd By: Steve Griffin

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

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 #: 226950
Client Project #: 90177720
Client Sample #: F - 62
Analyst: Steve Griffin
Comments:

Lab Sample #: 738238

Color: White
Characterization: Heterogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Cellulose	30 %	Filler/Binder	60 %
Amosite				Paint	10 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	30 %	Non-Fibrous Total:	70 %

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 #: 226950
Client Project #: 90177720
Client Sample #: F - 63
Analyst: Steve Griffin
Comments:

Lab Sample #: 738239

Color: Black
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/12/2018
QC'd By: Steve Griffin

<u>ASBESTOS COMPONENTS</u>		<u>FIBROUS COMPONENTS</u>		<u>NON-FIBROUS COMPONENTS</u>	
Chrysotile		Fibrous Glass	50 %	Filler/Binder	
Amosite				Tar	50 %
Crocidolite					
Tremolite					
Actinolite					
Anthophyllite					
Asbestos Total:	NAD	Fibrous Total:	50 %	Non-Fibrous Total:	50 %

SAMPLE LAYER DETAILS

BULK SAMPLE ANALYSIS REPORT

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 64
Analyst: Steve Griffin
Comments:

Lab Sample #: 738240

Color: Black
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	Fibrous Glass	50 % Filler/Binder
Amosite		Tar
Crocidolite		50 %
Tremolite		
Actinolite		
<u>Anthophyllite</u>		
Asbestos Total: NAD	Fibrous Total: 50 %	Non-Fibrous Total: 50 %

SAMPLE LAYER DETAILS

Lab Project #: 226950
Client Project #: 90177720
Client Sample #: F - 65
Analyst: Steve Griffin
Comments:

Lab Sample #: 738241

Color: Black
Characterization: Homogeneous, Fibrous
Date Analyzed: 1/12/2018

<u>ASBESTOS COMPONENTS</u>	<u>FIBROUS COMPONENTS</u>	<u>NON-FIBROUS COMPONENTS</u>
Chrysotile	10 % Cellulose	10 % Filler/Binder
Amosite		Tar
Crocidolite		80 %
Tremolite		
Actinolite		
<u>Anthophyllite</u>		
Asbestos Total: 10 %	Fibrous Total: 10 %	Non-Fibrous Total: 80 %

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	Terracon Consultants, Inc. 6911 Blanco Road San Antonio, Texas 78216
Phone: (512) 258-9114	Phone: (210) 641-2112
	Facsimile: (210) 641-2124

PROJECT INFORMATION	
Contact Person	Will DeVeau
Email Address	Will.Deveau@terracon.com / Warren.Dean@terracon.com
Project Number	90177720
Project Name	Fair Avenue Apts. – Fire Protection Improvements
Total Number of Samples	65

SAMPLE IDENTIFICATION	REQUESTED ANALYSIS	TURNAROUND TIME
F__-01 to __F__- 65	PLM	Standard

Relinquished By:	<i>Will DeVeau</i>	Received By:	
Date:	<i>1/15/18</i>	Date:	
Time:	<i>1:33</i>	Time:	
Relinquished By:		Received By:	<i>[Signature]</i>
Date:		Date:	<i>1/18</i>
Time:		Time:	<i>9:15</i>

226950

APPENDIX D

LEAD-CONTAINING PAINT SAMPLE SUMMARY

APPENDIX D
LEAD-CONTAINING PAINT SAMPLE SUMMARY
FAIR AVENUE APARTMENTS - FIRE PROTECTION IMPROVEMENTS
1215 Fair Avenue, San Antonio, Texas
Terracon Project No. 90177720

SAMPLE NO.	COMBINATION/ SUBSTRATE	FUNCTIONAL AREA	SAMPLE LOCATION	LEAD CONTENT
T-L01	Green / Drywall, Plaster	Applied to the walls in the Main Office hallway (west, south), Reception Office (south), Community Center Restroom hallway (southwest portion, west), Community Center Restrooms (south), Community Center (west), Mailbox Area wall, Resident Center (east, west), and the Corridor at Resident Center (south)	Office Hallway – Southwest	<36 ppm
T-L02	Tan / Drywall, Plaster	Applied to walls in select units, the Main Office hallway (north, east), Reception Office (north, east), Office #113, #112 (except north), #108, #109, (except east), #115, Office Server Room, Community Center Restroom Hallway (north, southeast portion), Community Center (north, east, south), Community Center Fur-downs, Community Center Kitchen, Resident Center (north, south), main Corridors, and Walls and ceilings in the Community Center Restrooms (except south wall)	Server Room - Northeast	<41 ppm
T-L03	White / Drywall, CMU	Applied to the walls and ceilings in the Janitors Closets and ceilings in select units	Janitor Closet #2 (1 st Floor) - Southwest	<45 ppm
T-L04	Light Gray / Concrete	Applied to the floors in the 1 st Floor Stairwells and Basement	1 st Floor Central Stairwell - Center	<42 ppm
T-L05	Yellow / Drywall	Applied to the walls in select units	Unit 104, Restroom – at Closet	<47 ppm
T-L06	Off-white / Drywall, CMU	Applied to the walls and ceilings in the Laundry Rooms	2 nd Floor Restroom - Southeast	<37 ppm
T-L07	Purple / Drywall	Applied to the accent walls in select units	Unit 215, Living Room - South	<38 ppm
T-L08	Green / Drywall	Applied to the walls in the 1st Floor Corridor Restrooms (east)	4 XRF readings throughout the functional areas	1.0 to 1.1 mg/cm²
T-L09	Tan / Drywall	Applied to the walls in the 1st Floor Corridor Restrooms (except east)	4 XRF readings throughout the functional areas	1.0 to 1.3 mg/cm²

< = Less Than
ppm = Parts per Million

APPENDIX E

LEAD LABORATORY ANALYTICAL REPORT



Environmental Hazards Services, L.L.C.
 7469 Whitepine Rd
 Richmond, VA 23237
 Telephone: 800.347.4010

Lead Paint Chip Analysis Report

Report Number: 18-01-00594

Client: Terracon - San Antonio
 6911 Blanco Road
 San Antonio, TX 78216

Received Date: 01/08/2018
 Analyzed Date: 01/10/2018
 Reported Date: 01/10/2018

Project/Test Address: Fair Ave Apartments - Fire Sprinkler; San Antonio, Texas
 Collection Date: 01/04/2018

Client Number:
 45-4903

Fax Number:
 210-641-2124

Laboratory Results

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
18-01-00594-001	T-L01		<36	<0.0036	
18-01-00594-002	T-L02		<41	<0.0041	
18-01-00594-003	T-L03		<45	<0.0045	L04
18-01-00594-004	T-L04		<42	<0.0042	
18-01-00594-005	T-L05		<47	<0.0047	
18-01-00594-006	T-L06		<37	<0.0037	
18-01-00594-007	T-L07		<38	<0.0038	

Environmental Hazards Services, L.L.C

Client Number: 45-4903

Report Number: 18-01-00594

Project/Test Address: Fair Ave Apartments - Fire Sprinkler; San Antonio, Texas

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
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Sample Narratives:

L04: Sample contains substantial amounts of substrate which may affect the calculated results with units of ppm and % by weight.

Preparation Method: ASTM E-1979-12

Analysis Method: EPA SW846 7000B

Accreditation #: TX T104704248-07TX

Reviewed By Authorized Signatory: *Melissa Kanode*

Missy Kanode
QA/QC Clerk

The HUD lead guidelines for lead paint chips are 0.50% by Weight, 5000 ppm, or 1.0 mg/cm². The Reporting Limit (RL) for samples prepared by ASTM E-1979-12 is 10.0 ug Total Pb. The RL for samples prepared by EPA SW846 3050B is 25.0 ug Total Pb. Paint chip area and results are calculated based on area measurements determined by the client. All internal quality control requirements associated with this batch were met, unless otherwise noted.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, area, etc., was provided by the client. Results reported above in mg/cm³ are calculated based on area supplied by client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C.


ELLAP Accreditation through AIHA-LAP, LLC (100420), NY ELAP #11714.

LEGEND	Pb= lead	ug = microgram	ppm = parts per million
	ug/g = micrograms per gram	Wt. = weight	



Lead Chain-of-Custody

18-01-00594



Due Date:
01/11/2018
(Thursday)
AE

TM

Environmental Hazards Services, LLC

www.leadlab.com 7469 Whitepine Rd
(800) 347-4010 Richmond, VA
(804) 275-4907 (fax) 23237

Company Name: Terracon Consultants, Inc. Address: 6911 Blanco Road City/State/Zip: San Antonio, Texas 78216
 Phone: (210) 714-2086 Fax: (210) 641-2124 E-mail: wpdean@terracon.com, gagonzalez@terracon.com Acct. Number: 45-4903
 Project Name / Testing Address: Fair Ave Apartments - Fire Sprinkler City/State (Required): San Antonio, Texas
 Collected by: Warren Dean Certification Number: 2071063 Purchase Order Number: 90177720

* Do wipe samples submitted meet ASTM E1792 requirements? Yes No

Turn Around Time (TAT) <input type="checkbox"/> 1-Day <input checked="" type="checkbox"/> 3-Day <input type="checkbox"/> Same Day (Must Call Ahead) <input type="checkbox"/> Weekend (Must Call Ahead) If no TAT is specified, sample(s) will be processed and charged as 3-Day TAT.	Sample Type Single Dust Wipe = DW Soil = S Paint Chip = PC Air = A Composite Soil = CS	Abbreviations FR = Family Room F = Front 0 = Basement LR = Living Room R = Rear KT = Kitchen DN = Den LT = Left BA = Bath DR = Dining Room RT = Right BR = Bedroom 1 = 1st Fl 2 = 2nd Fl	Surface Type for Dust Wipe FL = Floor CP = Carpet SL = Window Sill WW = Window Well
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No.	Sample Type	Date Collected	Client Sample ID	Collection Location (LR, KT, LTFBR, RTRBR, etc.)	Surface Type	Area			Paint Chip			Air			Comments
						Length X Width in inches (Provide paint chip area only if requesting mg/cm2)	mg/cm ²	PPM	%	Flow Rate (L/ min)	Total Time (minutes)	Volume (Total Liters)			
1	PC	1/4/18	T-L01			X			X						
2	PC	1/4/18	T-L02			X			X						
3	PC	1/4/18	T-L03			X			X						
4	PC	1/4/18	T-L04			X			X						
5	PC	1/4/18	T-L05			X			X						
6	PC	1/4/18	T-L06			X			X						
7	PC	1/4/18	T-L07			X			X						
8						X									
9						X									
10						X									

SW 7

Released by: <u>Warren Dean</u>	Signature:	Date/Time: <u>1/5/18</u>
Received by: <u>Nicoleau</u>	Signature:	Date/Time: <u>1/8/18 1:36pm</u>

APPENDIX F

LEAD BASED PAINT XRF ANALYTICAL REPORT



LEAD BASED PAINT XRF ANALYTICAL REPORT

Terracon Consultants, Inc.
San Antonio, Texas

INSPECTION DATE: 01/04/2018 - 01/05/2018

REPORT NUMBER: 90177720

INSTRUMENT TYPE: Heuresis Corp.
Pb200i XRF Lead Paint Analyzer
1570

ACTION LEVEL: 1.0 mg/cm²

STATEMENT: The calibration of the Heuresis Pb200i XRF instrument was done in accordance with the Performance Characteristic Sheet (PCS). The Heuresis Pb200i XRF instrument was calibrated using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM).

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
1	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
2	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
3	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
4	Negative	Drywall	C	Intact	Green	Reception		-0.2 mg/cm ²	Action Level
5	Negative	Drywall	C	Intact	Green	Reception		-0.1 mg/cm ²	Action Level
6	Negative	Drywall	D	Intact	Green	Office Hallway		-0.2 mg/cm ²	Action Level
7	Negative	Drywall	D	Intact	Green	Office Hallway		-0.1 mg/cm ²	Action Level
8	Negative	Drywall	C	Intact	Green	Office Hallway		-0.1 mg/cm ²	Action Level
9	Negative	Drywall	C	Intact	Green	Office Hallway		0.0 mg/cm ²	Action Level
10	Negative	Drywall	C	Intact	Green	Office Hallway		-0.1 mg/cm ²	Action Level
11	Negative	Drywall	A	Intact	Green	Office 112		-0.1 mg/cm ²	Action Level
12	Negative	Drywall	A	Intact	Green	Office 112		-0.1 mg/cm ²	Action Level
13	Negative	Drywall	B	Intact	Green	Office 109		-0.1 mg/cm ²	Action Level
14	Negative	Drywall	B	Intact	Green	Office 109		-0.2 mg/cm ²	Action Level
15	Negative	Drywall	A	Intact	Tan	Reception		-0.4 mg/cm ²	Action Level
16	Negative	Drywall	B	Intact	Tan	Reception		-0.3 mg/cm ²	Action Level
17	Negative	Drywall	A	Intact	Tan	Office hallway		-0.3 mg/cm ²	Action Level
18	Negative	Drywall	A	Intact	Tan	Office hallway		-0.3 mg/cm ²	Action Level
19	Negative	Drywall	B	Intact	Tan	Office hallway		-0.5 mg/cm ²	Action Level
20	Negative	Drywall	B	Intact	Tan	Office 113		0.1 mg/cm ²	Action Level
21	Negative	Drywall	D	Intact	Tan	Office 113		-0.3 mg/cm ²	Action Level
22	Negative	Drywall	A	Intact	Tan	Office 113		-0.2 mg/cm ²	Action Level
23	Negative	Drywall	C	Intact	Tan	Office 113		-0.2 mg/cm ²	Action Level
24	Negative	Drywall	B	Intact	Tan	Office 112		-0.3 mg/cm ²	Action Level
25	Negative	Drywall	C	Intact	Tan	Office 112		0.1 mg/cm ²	Action Level
26	Negative	Drywall	D	Intact	Tan	Office 112		-0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
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 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
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 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
27	Negative	Plaster	A	Intact	Tan	Office 108		0.1 mg/cm ²	Action Level
28	Negative	Drywall	B	Intact	Tan	Office 108		-0.1 mg/cm ²	Action Level
29	Negative	Drywall	C	Intact	Tan	Office 108		0.1 mg/cm ²	Action Level
30	Negative	Drywall	D	Intact	Tan	Office 108		-0.2 mg/cm ²	Action Level
31	Negative	Drywall	A	Intact	Tan	Office 109		0.2 mg/cm ²	Action Level
32	Negative	Drywall	C	Intact	Tan	Office 109		0.1 mg/cm ²	Action Level
33	Negative	Drywall	C	Intact	Tan	Office 109		-0.3 mg/cm ²	Action Level
34	Negative	Drywall	D	Intact	Tan	Office 109		0.1 mg/cm ²	Action Level
35	Negative	Drywall	A	Intact	Tan	Server room		-0.2 mg/cm ²	Action Level
36	Negative	Drywall	B	Intact	Tan	Server room		0.1 mg/cm ²	Action Level
37	Negative	Drywall	D	Intact	Tan	Server room		-0.3 mg/cm ²	Action Level
38	Negative	Metal		Intact	Brown	Reception Door Frame		-0.1 mg/cm ²	Action Level
39	Negative	Metal		Intact	Brown	Office 115 Door Frame		-0.1 mg/cm ²	Action Level
40	Negative	Drywall	C	Intact	Green	Restroom Hallway		-0.1 mg/cm ²	Action Level
41	Negative	Drywall	B	Intact	Green	Restroom Hallway		-0.2 mg/cm ²	Action Level
42	Negative	Drywall	C	Intact	Green	M Restroom		-0.3 mg/cm ²	Action Level
43	Negative	Drywall	C	Intact	Green	M Restroom		0.2 mg/cm ²	Action Level
44	Negative	Drywall	C	Intact	Green	W Restroom		0.0 mg/cm ²	Action Level
45	Negative	Drywall	C	Intact	Green	W Restroom		0.1 mg/cm ²	Action Level
46	Negative	Drywall	D	Intact	Green	Com Center		-0.1 mg/cm ²	Action Level
47	Negative	Drywall	D	Intact	Green	Com Center		-0.2 mg/cm ²	Action Level
48	Negative	Drywall	B	Intact	Green	Mailbox Wall		-0.2 mg/cm ²	Action Level
49	Negative	Drywall	B	Intact	Green	Mailbox Wall		-0.3 mg/cm ²	Action Level
50	Negative	Drywall	C	Intact	Green	main hallway, resident cntr		-0.1 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
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Inspection Site: Fair Avenue Apartments, Fire
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Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
51	Negative	Drywall	C	Intact	Green	main hallway, resident cntr		-0.1 mg/cm ²	Action Level
52	Negative	Drywall	A	Intact	Tan	Restroom Hallway		-0.3 mg/cm ²	Action Level
53	Negative	Drywall	B	Intact	Tan	M Restroom		0.0 mg/cm ²	Action Level
54	Negative	Drywall	D	Intact	Tan	W Restroom		-0.2 mg/cm ²	Action Level
55	Negative	Drywall	A	Intact	Tan	kitchen		0.0 mg/cm ²	Action Level
56	Negative	Drywall	C	Intact	Tan	kitchen		0.0 mg/cm ²	Action Level
57	Negative	Drywall	A	Intact	Tan	Com Center		-0.3 mg/cm ²	Action Level
58	Negative	Drywall	B	Intact	Tan	Com Center		-0.3 mg/cm ²	Action Level
59	Negative	Drywall	C	Intact	Tan	Com Center		-0.2 mg/cm ²	Action Level
60	Negative	Drywall	B	Intact	Tan	Hallway at Reception		-0.4 mg/cm ²	Action Level
61	Negative	Drywall	D	Intact	Tan	Hallway at Reception		-0.2 mg/cm ²	Action Level
62	Negative	Drywall	D	Intact	Tan	Hallway at Mailbox		-0.3 mg/cm ²	Action Level
63	Negative	Drywall	B	Intact	Tan	Hallway at Mailbox		-0.2 mg/cm ²	Action Level
64	Negative	Drywall	A	Intact	Tan	Resident Center		-0.2 mg/cm ²	Action Level
65	Negative	Drywall	A	Intact	Tan	Resident Center		-0.3 mg/cm ²	Action Level
66	Negative	Drywall	C	Intact	Tan	Resident Center		0.1 mg/cm ²	Action Level
67	Negative	Drywall	C	Intact	Tan	Resident Center		-0.2 mg/cm ²	Action Level
68	Negative	Drywall	D	Intact	Green	Resident Center		-0.3 mg/cm ²	Action Level
69	Negative	Drywall	B	Intact	Green	Resident Center		-0.3 mg/cm ²	Action Level
70	Positive	Drywall	B	Intact	Green	Hallway M Restroom		1.0 mg/cm ²	Action Level
71	Positive	Drywall	B	Intact	Green	Hallway M Restroom		1.1 mg/cm ²	Action Level
72	Negative	Drywall	A	Intact	Green	Hallway M Restroom		0.1 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

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Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
73	Positive	Drywall	B	Intact	Green	Hallway W Restroom		1.0 mg/cm ²	Action Level
74	Positive	Drywall	B	Intact	Green	Hallway W Restroom		1.0 mg/cm ²	Action Level
75	Negative	Drywall	C	Intact	Green	Hallway W Restroom		0.2 mg/cm ²	Action Level
76	Negative	Drywall	A	Intact	Tan	Hallway W Restroom		0.9 mg/cm ²	Action Level
77	Positive	Drywall	A	Intact	Tan	Hallway W Restroom		1.1 mg/cm ²	Action Level
78	Positive	Drywall	C	Intact	Tan	Hallway W Restroom		1.3 mg/cm ²	Action Level
79	Positive	Drywall	C	Intact	Tan	Hallway M Restroom		1.0 mg/cm ²	Action Level
80	Positive	Drywall	C	Intact	Tan	Hallway M Restroom		1.1 mg/cm ²	Action Level
81	Negative	Drywall	C	Intact	Tan	Hallway M Restroom		0.7 mg/cm ²	Action Level
82	Negative	Drywall		Intact	Tan	Hallway M Restroom ceiling		-0.2 mg/cm ²	Action Level
83	Negative	Drywall		Intact	Tan	Hallway M Restroom ceiling		-0.2 mg/cm ²	Action Level
84	Negative	Drywall		Intact	Tan	Hallway W Restroom ceiling		-0.2 mg/cm ²	Action Level
85	Negative	Drywall		Intact	Tan	Hallway W Restroom ceiling		-0.2 mg/cm ²	Action Level
86	Negative	Drywall	B	Intact	White	Janitors #2, 1st flr		-0.2 mg/cm ²	Action Level
87	Negative	Drywall	D	Intact	White	Janitors #2, 1st flr		-0.3 mg/cm ²	Action Level
88	Negative	Drywall		Intact	White	Janitors #2, 1st flr		-0.1 mg/cm ²	Action Level
89	Negative	Cinder Block	A	Intact	White	Janitors #1, 1st flr		-0.4 mg/cm ²	Action Level
90	Negative	Cinder Block	C	Intact	White	Janitors #1, 1st flr		-0.3 mg/cm ²	Action Level

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Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
91	Negative	Drywall		Intact	White	Janitors #1, 1st flr		0.1 mg/cm ²	Action Level
92	Negative	Drywall		Intact	Tan	1st flr N Hallway		-0.3 mg/cm ²	Action Level
93	Negative	Drywall		Intact	Tan	1st flr N Hallway		0.1 mg/cm ²	Action Level
94	Negative	Drywall		Intact	Tan	1st flr N Hallway		-0.3 mg/cm ²	Action Level
95	Negative	Drywall		Intact	Tan	1st flr N Hallway		-0.2 mg/cm ²	Action Level
96	Negative	Drywall		Intact	Tan	1st flr N Hallway		-0.3 mg/cm ²	Action Level
97	Negative	Drywall		Intact	Tan	1st flr N Hallway		0.0 mg/cm ²	Action Level
98	Negative	Drywall		Intact	Tan	1st flr N Hallway		-0.2 mg/cm ²	Action Level
99	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.4 mg/cm ²	Action Level
100	Negative	Drywall		Intact	Tan	1st flr W Hallway		0.1 mg/cm ²	Action Level
101	Negative	Drywall		Intact	Tan	1st flr W Hallway		0.2 mg/cm ²	Action Level
102	Negative	Drywall		Intact	Tan	1st flr W Hallway		0.1 mg/cm ²	Action Level
103	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.2 mg/cm ²	Action Level
104	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.2 mg/cm ²	Action Level
105	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.2 mg/cm ²	Action Level
106	Negative	Drywall		Intact	Tan	1st flr W Hallway		0.1 mg/cm ²	Action Level
107	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.2 mg/cm ²	Action Level
108	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.2 mg/cm ²	Action Level
109	Negative	Drywall		Intact	Tan	1st flr W Hallway		-0.1 mg/cm ²	Action Level
110	Negative	Drywall		Intact	Tan	1st flr elevator lobby		-0.1 mg/cm ²	Action Level
111	Negative	Drywall		Intact	Tan	1st flr elevator lobby		-0.1 mg/cm ²	Action Level
112	Negative	Concrete		Intact	Gray	1st flr Central stair		0.1 mg/cm ²	Action Level
113	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
114	Positive			Intact			Calibration	1.1 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

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115	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
116	Negative	Drywall	D	Intact	Lt-Yellow	unit 104		-0.2 mg/cm ²	Action Level
117	Negative	Concrete	A	Intact	Lt-Yellow	unit 104		0.1 mg/cm ²	Action Level
118	Negative	Concrete	A	Intact	Lt-Yellow	unit 104		-0.3 mg/cm ²	Action Level
119	Negative	Drywall	B	Intact	Lt-Yellow	unit 104		-0.2 mg/cm ²	Action Level
120	Negative	Drywall	C	Intact	Lt-Yellow	unit 104		0.0 mg/cm ²	Action Level
121	Negative	Drywall		Intact	White	unit 104		-0.3 mg/cm ²	Action Level
122	Negative	Drywall		Intact	White	unit 104		-0.2 mg/cm ²	Action Level
123	Negative	Drywall		Intact	White	unit 104		-0.3 mg/cm ²	Action Level
124	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		-0.1 mg/cm ²	Action Level
125	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		-0.2 mg/cm ²	Action Level
126	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		0.1 mg/cm ²	Action Level
127	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		-0.2 mg/cm ²	Action Level
128	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		0.2 mg/cm ²	Action Level
129	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		-0.1 mg/cm ²	Action Level
130	Negative	Drywall		Intact	Tan	2nd Flr N. Hallway		0.0 mg/cm ²	Action Level
131	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		-0.1 mg/cm ²	Action Level
132	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		-0.2 mg/cm ²	Action Level
133	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		-0.1 mg/cm ²	Action Level
134	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		0.0 mg/cm ²	Action Level
135	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		-0.2 mg/cm ²	Action Level

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136	Negative	Drywall		Intact	Tan	2nd Flr W. Hallway		0.1 mg/cm ²	Action Level
137	Negative	Cinder Block		Intact	Off-White	2nd Flr laundry rm		-0.4 mg/cm ²	Action Level
138	Negative	Cinder Block		Intact	Off-White	2nd Flr laundry rm		-0.3 mg/cm ²	Action Level
139	Negative	Cinder Block		Intact	Off-White	2nd Flr laundry rm		-0.5 mg/cm ²	Action Level
140	Negative	Cinder Block		Intact	Off-White	2nd Flr laundry rm		-0.5 mg/cm ²	Action Level
141	Negative	Drywall		Intact	Off-White	2nd Flr laundry rm		0.1 mg/cm ²	Action Level
142	Negative	Cinder Block		Intact	White	2nd Flr jan closet		-0.3 mg/cm ²	Action Level
143	Negative	Cinder Block		Intact	White	2nd Flr jan closet		-0.3 mg/cm ²	Action Level
144	Negative	Cinder Block		Intact	White	2nd Flr jan closet		-0.4 mg/cm ²	Action Level
145	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
146	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.1 mg/cm ²	Action Level
147	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
148	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.1 mg/cm ²	Action Level
149	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.3 mg/cm ²	Action Level
150	Negative	Drywall		Intact	Lt-Yellow	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
151	Negative	Drywall		Intact	Purple	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
152	Negative	Concrete		Intact	Purple	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
153	Negative	Concrete		Intact	White	2nd Flr unit 215		-0.2 mg/cm ²	Action Level
154	Negative	Drywall		Intact	White	3rd Flr N. Hallway		-0.1 mg/cm ²	Action Level
155	Negative	Drywall		Intact	White	3rd Flr N. Hallway		-0.2 mg/cm ²	Action Level
156	Negative	Drywall		Intact	White	3rd Flr N. Hallway		-0.2 mg/cm ²	Action Level
157	Negative	Drywall		Intact	White	3rd Flr N. Hallway		-0.2 mg/cm ²	Action Level
158	Negative	Drywall		Intact	White	3rd Flr N. Hallway		0.0 mg/cm ²	Action Level

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159	Negative	Drywall		Intact	White	3rd Flr N. Hallway		0.1 mg/cm ²	Action Level
160	Negative	Drywall		Intact	Tan	3rd Flr W. Hallway		-0.2 mg/cm ²	Action Level
161	Negative	Drywall		Intact	Tan	3rd Flr W. Hallway		0.0 mg/cm ²	Action Level
162	Negative	Drywall		Intact	Tan	3rd Flr W. Hallway		-0.2 mg/cm ²	Action Level
163	Negative	Drywall		Intact	Tan	3rd Flr W. Hallway		0.1 mg/cm ²	Action Level
164	Negative	Cinder Block		Intact	Off-White	3rd Flr laundry room		-0.5 mg/cm ²	Action Level
165	Negative	Cinder Block		Intact	Off-White	3rd Flr laundry room		-0.5 mg/cm ²	Action Level
166	Negative	Cinder Block		Intact	White	3rd Flr jan closet		-0.3 mg/cm ²	Action Level
167	Negative	Cinder Block		Intact	White	3rd Flr jan closet		-0.2 mg/cm ²	Action Level
168	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		-0.2 mg/cm ²	Action Level
169	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		0.3 mg/cm ²	Action Level
170	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		0.1 mg/cm ²	Action Level
171	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		-0.4 mg/cm ²	Action Level
172	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		-0.2 mg/cm ²	Action Level
173	Negative	Drywall		Intact	Lt-Yellow	3rd Flr unit 302		-0.1 mg/cm ²	Action Level
174	Negative	Drywall		Intact	Purple	3rd Flr unit 302		0.2 mg/cm ²	Action Level
175	Negative	Drywall		Intact	Purple	3rd Flr unit 302		-0.1 mg/cm ²	Action Level
176	Negative	Drywall		Intact	White	3rd Flr unit 302		0.1 mg/cm ²	Action Level
177	Negative	Drywall		Intact	White	3rd Flr unit 302		-0.1 mg/cm ²	Action Level
178	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		-0.3 mg/cm ²	Action Level
179	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		-0.2 mg/cm ²	Action Level
180	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		0.1 mg/cm ²	Action Level
181	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		0.1 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
182	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		0.1 mg/cm ²	Action Level
183	Negative	Drywall		Intact	Tan	4th Flr N. Hallway		0.1 mg/cm ²	Action Level
184	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		-0.2 mg/cm ²	Action Level
185	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		-0.2 mg/cm ²	Action Level
186	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		-0.3 mg/cm ²	Action Level
187	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		0.0 mg/cm ²	Action Level
188	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		-0.2 mg/cm ²	Action Level
189	Negative	Drywall		Intact	Tan	4th Flr W. Hallway		-0.2 mg/cm ²	Action Level
190	Negative	Cinder Block		Intact	Off-White	4th Flr laundry room		-0.3 mg/cm ²	Action Level
191	Negative	Cinder Block		Intact	Off-White	4th Flr laundry room		-0.2 mg/cm ²	Action Level
192	Negative	Drywall		Intact	Off-White	4th Flr laundry room		0.1 mg/cm ²	Action Level
193	Negative	Cinder Block		Intact	White	4th Flr jan closet		-0.4 mg/cm ²	Action Level
194	Negative	Cinder Block		Intact	White	4th Flr jan closet		-0.6 mg/cm ²	Action Level
195	Negative	Drywall		Intact	White	4th Flr jan closet		-0.2 mg/cm ²	Action Level
196	Negative	Drywall		Intact	Lt-Yellow	4th Flr unit 411		-0.2 mg/cm ²	Action Level
197	Negative	Drywall		Intact	Lt-Yellow	4th Flr unit 411		0.1 mg/cm ²	Action Level
198	Negative	Drywall		Intact	Lt-Yellow	4th Flr unit 411		-0.1 mg/cm ²	Action Level
199	Negative	Drywall		Intact	Purple	4th Flr unit 411		-0.2 mg/cm ²	Action Level
200	Negative	Drywall		Intact	Purple	4th Flr unit 411		-0.2 mg/cm ²	Action Level
201	Negative	Drywall		Intact	White	4th Flr unit 411		-0.2 mg/cm ²	Action Level
202	Negative	Drywall		Intact	White	4th Flr unit 411		-0.2 mg/cm ²	Action Level
203	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		-0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
204	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		-0.3 mg/cm ²	Action Level
205	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		0.1 mg/cm ²	Action Level
206	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		0.1 mg/cm ²	Action Level
207	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		0.1 mg/cm ²	Action Level
208	Negative	Drywall		Intact	Tan	5th Flr N.Hallway		-0.3 mg/cm ²	Action Level
209	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		-0.3 mg/cm ²	Action Level
210	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		0.1 mg/cm ²	Action Level
211	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		0.2 mg/cm ²	Action Level
212	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		0.1 mg/cm ²	Action Level
213	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		0.1 mg/cm ²	Action Level
214	Negative	Drywall		Intact	Tan	5th Flr W.Hallway		0.0 mg/cm ²	Action Level
215	Negative	Cinder Block		Intact	Off-White	5th Flr laundry rm		-0.3 mg/cm ²	Action Level
216	Negative	Cinder Block		Intact	Off-White	5th Flr laundry rm		-0.4 mg/cm ²	Action Level
217	Negative	Cinder Block		Intact	Off-White	5th Flr laundry rm		-0.1 mg/cm ²	Action Level
218	Negative	Cinder Block		Intact	White	5th Flr Jan Closet		-0.5 mg/cm ²	Action Level
219	Negative	Cinder Block		Intact	White	5th Flr Jan Closet		-0.5 mg/cm ²	Action Level
220	Negative	Drywall		Intact	White	5th Flr Jan Closet		-0.1 mg/cm ²	Action Level
221	Negative	Drywall		Intact	Lt-Yellow	5th Flr Unit 504		0.2 mg/cm ²	Action Level
222	Negative	Drywall		Intact	Lt-Yellow	5th Flr Unit 504		-0.3 mg/cm ²	Action Level
223	Negative	Drywall		Intact	Lt-Yellow	5th Flr Unit 504		-0.3 mg/cm ²	Action Level
224	Negative	Drywall		Intact	Purple	5th Flr Unit 504		-0.2 mg/cm ²	Action Level
225	Negative	Drywall		Intact	Purple	5th Flr Unit 504		-0.1 mg/cm ²	Action Level
226	Negative	Drywall		Intact	White	5th Flr Unit 504		0.0 mg/cm ²	Action Level
227	Negative	Drywall		Intact	White	5th Flr Unit 504		-0.1 mg/cm ²	Action Level
228	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		-0.3 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
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Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
229	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		-0.3 mg/cm ²	Action Level
230	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		-0.2 mg/cm ²	Action Level
231	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		0.1 mg/cm ²	Action Level
232	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		0.2 mg/cm ²	Action Level
233	Negative	Drywall		Intact	Tan	6th Flr N.Hallway		0.1 mg/cm ²	Action Level
234	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		0.1 mg/cm ²	Action Level
235	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		0.1 mg/cm ²	Action Level
236	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		-0.3 mg/cm ²	Action Level
237	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		-0.4 mg/cm ²	Action Level
238	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		0.1 mg/cm ²	Action Level
239	Negative	Drywall		Intact	Tan	6th Flr W.Hallway		-0.3 mg/cm ²	Action Level
240	Negative	Cinder Block		Intact	Off-White	6th Flr laundry rm		-0.5 mg/cm ²	Action Level
241	Negative	Cinder Block		Intact	Off-White	6th Flr laundry rm		-0.3 mg/cm ²	Action Level
242	Negative	Cinder Block		Intact	Off-White	6th Flr laundry rm		0.0 mg/cm ²	Action Level
243	Negative	Cinder Block		Intact	White	6th Flr jan closet		-0.5 mg/cm ²	Action Level
244	Negative	Cinder Block		Intact	White	6th Flr jan closet		-0.4 mg/cm ²	Action Level
245	Negative	Cinder Block		Intact	White	6th Flr jan closet		0.1 mg/cm ²	Action Level
246	Negative	Drywall		Intact	Lt-Yellow	6th Flr unit 618		-0.3 mg/cm ²	Action Level
247	Negative	Drywall		Intact	Lt-Yellow	6th Flr unit 618		0.1 mg/cm ²	Action Level
248	Negative	Drywall		Intact	Lt-Yellow	6th Flr unit 618		0.1 mg/cm ²	Action Level
249	Negative	Drywall		Intact	Lt-Yellow	6th Flr unit 618		-0.1 mg/cm ²	Action Level
250	Negative	Drywall		Intact	Lt-Yellow	6th Flr unit 618		0.1 mg/cm ²	Action Level
251	Negative	Drywall		Intact	Purple	6th Flr unit 618		-0.2 mg/cm ²	Action Level
252	Negative	Drywall		Intact	Purple	6th Flr unit 618		-0.3 mg/cm ²	Action Level
253	Negative	Drywall		Intact	White	6th Flr unit 618		-0.1 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
254	Negative	Drywall		Intact	White	6th Flr unit 618		0.0 mg/cm ²	Action Level
255	Negative			Intact			Calibration	0.9 mg/cm ²	Action Level
256	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
257	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
258	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
259	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
260	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
261	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
262	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		-0.2 mg/cm ²	Action Level
263	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		-0.3 mg/cm ²	Action Level
264	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		0.1 mg/cm ²	Action Level
265	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		0.0 mg/cm ²	Action Level
266	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		0.1 mg/cm ²	Action Level
267	Negative	Drywall		Intact	Tan	7th Flr N.Hallway		0.1 mg/cm ²	Action Level
268	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		-0.3 mg/cm ²	Action Level
269	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		-0.3 mg/cm ²	Action Level
270	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		0.0 mg/cm ²	Action Level
271	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		-0.2 mg/cm ²	Action Level
272	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		0.1 mg/cm ²	Action Level
273	Negative	Drywall		Intact	Tan	7th Flr W.Hallway		0.1 mg/cm ²	Action Level
274	Negative	Cinder Block		Intact	Off-White	7th Flr laundry		-0.3 mg/cm ²	Action Level
275	Negative	Cinder Block		Intact	Off-White	7th Flr laundry		-0.3 mg/cm ²	Action Level
276	Negative	Cinder Block		Intact	Off-White	7th Flr laundry		0.1 mg/cm ²	Action Level
277	Negative	Cinder Block		Intact	White	7th Flr jan closet		-0.4 mg/cm ²	Action Level
278	Negative	Cinder Block		Intact	White	7th Flr jan closet		-0.5 mg/cm ²	Action Level
279	Negative	Drywall		Intact	White	7th Flr jan closet		0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
280	Negative	Drywall		Intact	Lt-Yellow	7th Flr unit 707		-0.3 mg/cm ²	Action Level
281	Negative	Drywall		Intact	Lt-Yellow	7th Flr unit 707		0.1 mg/cm ²	Action Level
282	Negative	Drywall		Intact	Lt-Yellow	7th Flr unit 707		-0.2 mg/cm ²	Action Level
283	Negative	Drywall		Intact	Lt-Yellow	7th Flr unit 707		-0.1 mg/cm ²	Action Level
284	Negative	Drywall		Intact	Purple	7th Flr unit 707		-0.3 mg/cm ²	Action Level
285	Negative	Drywall		Intact	Purple	7th Flr unit 707		-0.4 mg/cm ²	Action Level
286	Negative	Drywall		Intact	White	7th Flr unit 707		0.0 mg/cm ²	Action Level
287	Negative	Drywall		Intact	White	7th Flr unit 707		0.1 mg/cm ²	Action Level
288	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		0.1 mg/cm ²	Action Level
289	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		-0.1 mg/cm ²	Action Level
290	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		-0.2 mg/cm ²	Action Level
291	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		0.1 mg/cm ²	Action Level
292	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		0.0 mg/cm ²	Action Level
293	Negative	Drywall		Intact	Tan	8th Flr N.Hallway		-0.2 mg/cm ²	Action Level
294	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		-0.3 mg/cm ²	Action Level
295	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		-0.2 mg/cm ²	Action Level
296	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		0.0 mg/cm ²	Action Level
297	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		0.1 mg/cm ²	Action Level
298	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		0.0 mg/cm ²	Action Level
299	Negative	Drywall		Intact	Tan	8th Flr W.Hallway		-0.3 mg/cm ²	Action Level
300	Negative	Cinder Block		Intact	Off-White	8th Flr laundry		-0.4 mg/cm ²	Action Level
301	Negative	Cinder Block		Intact	Off-White	8th Flr laundry		-0.3 mg/cm ²	Action Level
302	Negative	Concrete		Intact	Off-White	8th Flr laundry		0.0 mg/cm ²	Action Level
303	Negative	Cinder Block		Intact	White	8th Jan closet		-0.4 mg/cm ²	Action Level
304	Negative	Cinder Block		Intact	White	8th Jan closet		-0.5 mg/cm ²	Action Level
305	Negative	Drywall		Intact	White	8th Jan closet		0.0 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
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Inspection Site: Fair Avenue Apartments, Fire
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 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
306	Negative	Drywall		Intact	Tan	8th Flr unit 812		0.1 mg/cm ²	Action Level
307	Negative	Drywall		Intact	Tan	8th Flr unit 812		-0.2 mg/cm ²	Action Level
308	Negative	Drywall		Intact	Tan	8th Flr unit 812		0.1 mg/cm ²	Action Level
309	Negative	Drywall		Intact	Tan	8th Flr unit 812		-0.2 mg/cm ²	Action Level
310	Negative	Drywall		Intact	Tan	8th Flr unit 812		-0.4 mg/cm ²	Action Level
311	Negative	Drywall		Intact	Tan	8th Flr unit 812		0.1 mg/cm ²	Action Level
312	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		-0.3 mg/cm ²	Action Level
313	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		-0.2 mg/cm ²	Action Level
314	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		-0.2 mg/cm ²	Action Level
315	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		-0.2 mg/cm ²	Action Level
316	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		0.2 mg/cm ²	Action Level
317	Negative	Drywall		Intact	Tan	9th Flr N.Hallway		-0.3 mg/cm ²	Action Level
318	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		0.1 mg/cm ²	Action Level
319	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		-0.2 mg/cm ²	Action Level
320	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		-0.3 mg/cm ²	Action Level
321	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		-0.2 mg/cm ²	Action Level
322	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		-0.2 mg/cm ²	Action Level
323	Negative	Drywall		Intact	Tan	9th Flr W.Hallway		0.1 mg/cm ²	Action Level
324	Negative	Cinder Block		Intact	Off-White	9th Flr laundry		-0.4 mg/cm ²	Action Level
325	Negative	Cinder Block		Intact	Off-White	9th Flr laundry		-0.3 mg/cm ²	Action Level
326	Negative	Concrete		Intact	Off-White	9th Flr laundry		0.1 mg/cm ²	Action Level
327	Negative	Cinder Block		Intact	White	9th Flr jan closet		-0.4 mg/cm ²	Action Level
328	Negative	Cinder Block		Intact	White	9th Flr jan closet		-0.2 mg/cm ²	Action Level
329	Negative	Drywall		Intact	White	9th Flr jan closet		0.1 mg/cm ²	Action Level
330	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.3 mg/cm ²	Action Level
331	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
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Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
332	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.2 mg/cm ²	Action Level
333	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.2 mg/cm ²	Action Level
334	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.4 mg/cm ²	Action Level
335	Negative	Drywall		Intact	Tan	9th Flr unit 908		0.0 mg/cm ²	Action Level
336	Negative	Drywall		Intact	Tan	9th Flr unit 908		-0.3 mg/cm ²	Action Level
337	Negative	Drywall		Intact	Tan	9th Flr unit 908		0.1 mg/cm ²	Action Level
338	Negative	Drywall		Intact	Tan	9th Flr unit 908		0.2 mg/cm ²	Action Level
339	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		-0.2 mg/cm ²	Action Level
340	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		0.0 mg/cm ²	Action Level
341	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		-0.4 mg/cm ²	Action Level
342	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		0.1 mg/cm ²	Action Level
343	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		0.1 mg/cm ²	Action Level
344	Negative	Drywall		Intact	Tan	10th Flr N.Hallway		-0.2 mg/cm ²	Action Level
345	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		-0.2 mg/cm ²	Action Level
346	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		-0.3 mg/cm ²	Action Level
347	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		-0.3 mg/cm ²	Action Level
348	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		-0.3 mg/cm ²	Action Level
349	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		0.1 mg/cm ²	Action Level
350	Negative	Drywall		Intact	Tan	10th Flr W.Hallway		0.1 mg/cm ²	Action Level
351	Negative	Cinder Block		Intact	Off-White	10th Flr laundry		-0.3 mg/cm ²	Action Level
352	Negative	Cinder Block		Intact	Off-White	10th Flr laundry		-0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
353	Negative	Concrete		Intact	Off-White	10th Flr laundry		0.1 mg/cm ²	Action Level
354	Negative	Cinder Block		Intact	White	10th Flr Jan closet		-0.2 mg/cm ²	Action Level
355	Negative	Cinder Block		Intact	White	10th Flr Jan closet		-0.5 mg/cm ²	Action Level
356	Negative	Drywall		Intact	White	10th Flr Jan closet		0.0 mg/cm ²	Action Level
357	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		-0.2 mg/cm ²	Action Level
358	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		-0.2 mg/cm ²	Action Level
359	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		0.0 mg/cm ²	Action Level
360	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		0.1 mg/cm ²	Action Level
361	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		0.1 mg/cm ²	Action Level
362	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		-0.2 mg/cm ²	Action Level
363	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		-0.2 mg/cm ²	Action Level
364	Negative	Drywall		Intact	Tan	10th Flr Unit 1013		0.1 mg/cm ²	Action Level
365	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		-0.3 mg/cm ²	Action Level
366	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		-0.4 mg/cm ²	Action Level
367	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		0.0 mg/cm ²	Action Level
368	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		-0.3 mg/cm ²	Action Level
369	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		-0.3 mg/cm ²	Action Level
370	Negative	Drywall		Intact	Tan	11th Flr N.Hallway		-0.4 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
371	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		0.0 mg/cm ²	Action Level
372	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		0.0 mg/cm ²	Action Level
373	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		-0.3 mg/cm ²	Action Level
374	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		0.1 mg/cm ²	Action Level
375	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		-0.2 mg/cm ²	Action Level
376	Negative	Drywall		Intact	Tan	11th Flr W.Hallway		0.0 mg/cm ²	Action Level
377	Negative	Cinder Block		Intact	Off-White	11th Flr laundry		-0.2 mg/cm ²	Action Level
378	Negative	Cinder Block		Intact	Off-White	11th Flr laundry		-0.1 mg/cm ²	Action Level
379	Negative	Concrete		Intact	Off-White	11th Flr laundry		0.1 mg/cm ²	Action Level
380	Negative	Cinder Block		Intact	White	11th Flr Jan closet		-0.5 mg/cm ²	Action Level
381	Negative	Cinder Block		Intact	White	11th Flr Jan closet		-0.5 mg/cm ²	Action Level
382	Negative	Drywall		Intact	White	11th Flr Jan closet		0.0 mg/cm ²	Action Level
383	Negative	Drywall		Intact	Lt-Yellow	11th Flr Unit 1109		-0.3 mg/cm ²	Action Level
384	Negative	Drywall		Intact	Lt-Yellow	11th Flr Unit 1109		-0.3 mg/cm ²	Action Level
385	Negative	Drywall		Intact	Lt-Yellow	11th Flr Unit 1109		-0.2 mg/cm ²	Action Level
386	Negative	Drywall		Intact	Lt-Yellow	11th Flr Unit 1109		-0.2 mg/cm ²	Action Level
387	Negative	Drywall		Intact	Lt-Yellow	11th Flr Unit 1109		-0.2 mg/cm ²	Action Level
388	Negative	Drywall		Intact	Purple	11th Flr Unit 1109		-0.3 mg/cm ²	Action Level
389	Negative	Drywall		Intact	Purple	11th Flr Unit 1109		-0.2 mg/cm ²	Action Level

LEAD BASED PAINT XRF ANALYTICAL REPORT

Inspection Date: 01/04/2018 - 01/05/2018
 Action Level: 1.0 mg/cm²
 Report Number: 90177720
 Total Readings: 404
 Unit Started: 01/04/2018 09:37:55
 Unit Ended: 01/05/2018 11:50:43

Inspection Site: Fair Avenue Apartments, Fire
 Protection Improvements
 1215 Fair Avenue
 San Antonio, Texas 78223

Read #	Result	Substrate	Side	Condition	Color	Notes	Calibration	Lead (mg/cm ²)	Mode
390	Negative	Drywall		Intact	White	11th Flr Unit 1109		0.1 mg/cm ²	Action Level
391	Negative	Drywall		Intact	White	11th Flr Unit 1109		-0.1 mg/cm ²	Action Level
392	Negative	Drywall		Intact	White	11th Flr Unit 1109		0.1 mg/cm ²	Action Level
393	Negative	Concrete		Intact	Gray	Roof Elevator Rm Flr		0.2 mg/cm ²	Action Level
394	Negative	Concrete		Intact	Gray	Roof Elevator Rm Flr		0.1 mg/cm ²	Action Level
395	Negative	Concrete		Intact	Gray	Basement Rm Flr		0.0 mg/cm ²	Action Level
396	Negative	Concrete		Intact	Gray	Basement Rm Flr		0.1 mg/cm ²	Action Level
397	Negative	Concrete		Intact	Gray	Basement Rm Flr		-0.1 mg/cm ²	Action Level
398	Negative	Concrete		Intact	Gray	Basement Rm Flr		0.0 mg/cm ²	Action Level
399	Negative	Concrete		Intact	Gray	Basement Rm Flr		0.0 mg/cm ²	Action Level
400	Negative	Metal		Intact	Gray	Basement fire pipe		0.1 mg/cm ²	Action Level
401	Negative	Metal		Intact	Gray	Basement fire pipe		0.1 mg/cm ²	Action Level
402	Positive			Intact			Calibration	1.1 mg/cm ²	Action Level
403	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level
404	Positive			Intact			Calibration	1.0 mg/cm ²	Action Level

----- END OF READINGS -----

APPENDIX G

XRF PERFORMANCE CHARACTERISTIC SHEET

Performance Characteristic Sheet

EFFECTIVE DATE: December 1, 2015

MANUFACTURER AND MODEL:

Make: *Heuresis*
Models: *Model Pb200i*
Source: *⁵⁷Co, 5 mCi (nominal – new source)*

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Action Level mode

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm ² (inclusive)

SUBSTRATE CORRECTION:

Not applicable

INCONCLUSIVE RANGE OR THRESHOLD:

ACTION LEVEL MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm²)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated using test results on building components in the HUD archive. Testing was conducted on 146 test samples in November 2015, with two separate instruments running software version 2.1-2 in Action Level test mode. The actual source strength of each instrument on the day of testing was approximately 2.0 mCi; source ages were approximately one year.

OPERATING PARAMETERS

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

XRF CALIBRATION CHECK:

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm² film).

If the average (rounded to 1 decimal place) of three readings is outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instrument into control before XRF testing proceeds.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Chapter 7 of the HUD Guidelines provides guidance on correcting XRF results for substrate bias. Supplemental guidance for using the paint film nearest 1.0 mg/cm² for substrate correction is provided:

XRF results are corrected for substrate bias by subtracting from each XRF result a correction value determined separately in each house for single-family housing or in each development for multifamily housing, for each substrate. The correction value is an average of XRF readings taken over the NIST SRM paint film nearest to 1.0 mg/cm² at test locations that have been scraped bare of their paint covering. Compute the correction values as follows:

Using the same XRF instrument, take three readings on a bare substrate area covered with the NIST SRM paint film nearest 1 mg/cm². Repeat this procedure by taking three more readings on a second bare substrate area of the same substrate covered with the NIST SRM.

Compute the correction value for each substrate type where XRF readings indicate substrate correction is needed by computing the average of all six readings as shown below.

For each substrate type (the 1.02 mg/cm² NIST SRM is shown in this example; use the actual lead loading of the NIST SRM used for substrate correction):

$$\text{Correction value} = (1\text{st} + 2\text{nd} + 3\text{rd} + 4\text{th} + 5\text{th} + 6\text{th Reading})/6 - 1.02 \text{ mg/cm}^2$$

Repeat this procedure for each substrate requiring substrate correction in the house or housing development.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing.

Conduct XRF re-testing at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below. Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family and multi-family housing, a result is defined as a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and the retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF readings.

Compute the average of all ten re-test XRF readings.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

In the Action Level paint test mode, the instrument takes the longest time to complete readings close to the Federal standard of 1.0 mg/cm². The table below shows the mean and standard deviation of actual reading times by reading level for paint samples during the November 2015 archive testing. The tested instruments reported readings to one decimal place. No significant differences in reading times by substrate were observed. These times apply only to instruments with the same source strength as those tested (2.0 mCi). Instruments with stronger sources will have shorter reading times and those with weaker sources, longer reading times, than those in the table.

Mean and Standard Deviation of Reading Times in Action Level Mode by Reading Level		
Reading (mg/cm²)	Mean Reading Time (seconds)	Standard Deviation (seconds)
< 0.7	3.48	0.47
0.7	7.29	1.92
0.8	13.95	1.78
0.9 – 1.2	15.25	0.66
1.3 – 1.4	6.08	2.50
≥ 1.5	3.32	0.05

CLASSIFICATION OF RESULTS:

XRF results are classified as **positive** if they are **greater than or equal** to the stated threshold for the instrument (1.0 mg/cm²), and *negative* if they are *less than* the threshold.

DOCUMENTATION:

A report titled *Methodology for XRF Performance Characteristic Sheets* (EPA 747-R-95-008) provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. The report may be downloaded at <http://www2.epa.gov/lead/methodology-xrf-performance-characteristic-sheets-epa-747-r-95-008-september-1997>.

This XRF Performance Characteristic Sheet (PCS) was developed by QuanTech, Inc., under a contract with the XRF manufacturer.

APPENDIX H
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".

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



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Be it known that

TERRACON CONSULTANTS INC

is certified to perform as a

Lead Firm

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1955 and Title 25, Texas Administrative Code, Chapter 295 relating to Texas Environmental Lead Reduction, as long as this license is not suspended or revoked.

A handwritten signature in cursive script, appearing to read "John Hellerstedt", followed by a horizontal line.

*John Hellerstedt, M.D.
Commissioner of Health*

License Number: 2110106

Control Number 6799

Expiration Date: 3/20/2018

(Void After Expiration Date)

VOID IF ALTERED NON-TRANSFERABLE



Health Services

Asbestos Individual Consultant

WILL C DEVEAU
License No. 105734
Control No. 97166
Expiration Date: 3/10/2019





DEPARTMENT OF HEALTH SERVICES

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

RICHARD I HOWES

License No. 105406

Control No. 97017

Expiration Date: 3/21/2018





TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Be it known that

WARREN P DEAN

is certified to perform as a

Lead Risk Assessor

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1955 and Title 25, Texas Administrative Code, Chapter 295 relating to Texas Environmental Lead Reduction, as long as this license is not suspended or revoked.

A handwritten signature in cursive script, appearing to read "John Hellerstedt".

John Hellerstedt, M.D.
Commissioner of Health

License Number: 2071063

Expiration Date: 4/28/2018

Void After Expiration Date

VOID IF ALTERED

Control Number 7226

NON-TRANSFERABLE



TEXAS DEPARTMENT OF STATE HEALTH SERVICES

Be it known that

RICHARD I HOWES

is certified to perform as a

Lead Abatement Project Designer

in the State of Texas and is hereby governed by the rights, privileges and responsibilities set forth in Texas Occupations Code, Chapter 1955 and Title 25, Texas Administrative Code, Chapter 295 relating to Texas Environmental Lead Reduction, as long as this license is not suspended or revoked.

A handwritten signature in black ink, appearing to read "Kirk Cole".

Kirk Cole, Interim
Commissioner of Health

License Number: 2090034

Expiration Date: 11/19/2017

Void After Expiration Date

VOID IF ALTERED

Control Number 8024

NON-TRANSFERABLE



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 Hellerstedt".

JOHN HELLERSTEDT, 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:*

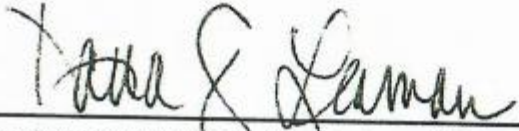
Asbestos Fiber Analysis

*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



Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to



Environmental Hazards Services, LLC

7469 Whitepine Road
North Chesterfield, VA 23237-2261

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704248-16-8

Effective Date: 1/1/2017

Expiration Date: 12/31/2017

A handwritten signature in black ink, appearing to read "R. D. A. Hyde".

Executive Director Texas Commission on
Environmental Quality



Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation



Environmental Hazards Services, LLC

7469 Whitepine Road
North Chesterfield, VA 23237-2261

Certificate: T104704248-16-8
Expiration Date: 12/31/2017
Issue Date: 1/1/2017

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: Solid & Chemical Materials

Method	Analyte	AB	Analyte ID	Method ID
Method EPA 1311	TCLP	VA	849	10118806
Method EPA 6010	Aluminum	VA	1000	10155609
	Antimony	VA	1005	10155609
	Arsenic	VA	1010	10155609
	Barium	VA	1015	10155609
	Beryllium	VA	1020	10155609
	Cadmium	VA	1030	10155609
	Chromium	VA	1040	10155609
	Cobalt	VA	1050	10155609
	Copper	VA	1055	10155609
	Iron	VA	1070	10155609
	Lead	VA	1075	10155609
	Magnesium	VA	1085	10155609
	Manganese	VA	1090	10155609
	Molybdenum	VA	1100	10155609
	Selenium	VA	1140	10155609
	Silver	VA	1150	10155609
	Thallium	VA	1165	10155609
	Titanium	VA	1180	10155609
	Vanadium	VA	1185	10155609
	Zinc	VA	1190	10155609
Method EPA 7471	Mercury	VA	1095	10166208



AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Environmental Hazards Services, LLC

7469 White Pine Road, Richmond, VA 23237

Laboratory ID: 100420

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

- | | |
|--|-------------------------------------|
| <input checked="" type="checkbox"/> INDUSTRIAL HYGIENE | Accreditation Expires: May 01, 2018 |
| <input checked="" type="checkbox"/> ENVIRONMENTAL LEAD | Accreditation Expires: May 01, 2018 |
| <input checked="" type="checkbox"/> ENVIRONMENTAL MICROBIOLOGY | Accreditation Expires: May 01, 2018 |
| <input type="checkbox"/> FOOD | Accreditation Expires: |
| <input type="checkbox"/> UNIQUE SCOPES | Accreditation Expires: |

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Gerald Schultz, CIH
Chairperson, Analytical Accreditation Board

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 14: 03/26/2014

Date Issued: 02/29/2016



AEHS, Inc.
An Environmental, Health, and Safety Consulting Firm
4402 Center Gate, San Antonio, Texas 78217 (210) 656-9300 fax (210) 656-8499

August 22, 2018

Mr. Todd Wingler, PE
Environmental and Sanitation Licensing Group MC 2835
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

Dear Mr. Wingler:

In concert with our previous telephone conversations, this letter is requesting a variance from the Texas Asbestos Health Protection Rules – TAHPR §295.60. OPERATIONS: ABATEMENT PRACTICES AND PROCEDURES FOR PUBLIC BUILDINGS. This variance request is in accordance with TAHPR §295.60(a)(2). The control methods are at least as protective of the public health (workers, building occupants, and the environment).

An Asbestos Exposure Assessment for simulating the installation of a new fire alarm system including the attachment of pipe run brackets, smoke alarms, smoke alarm strobes, etc., was conducted. This involved the monitoring during 50 simulated attachments which included the disturbance of asbestos containing textured drywall at the Fair Avenue Apartments. The apartment chosen was typical, included asbestos containing texture, and was unoccupied. The specific methodology to simulate the proposed variance is at Enclosure 1. Additionally, the monitoring results are included with Enclosure 1.

Based on the results of the Asbestos Exposure Assessment, a Negative Exposure Assessment was prepared and is included as Enclosure 2.

This information is provided by Ronald M. Bishop, MPH, CIH. Ron is a Certified Industrial Hygienist, Certified Safety Executive, Certified Environmental and Safety Compliance Officer as well as a Texas Department of State Health Services (TDSHS) Mold Assessment Consultant, Lead Risk Assessor and Project Designer, and Asbestos Consultant as well as a Green Consultant. Ron Bishop is also a TDSHS Lead, Asbestos, and Mold instructor for AEHS, Inc., which is a TDSHS certified Training Provider in the aforementioned disciplines.

The results of the air monitoring indicated that all sample results were at least a magnitude below the clearance level for asbestos abatement and therefore the general public could occupy the area.

If you have any questions or desire additional information, please contact Ron Bishop at 210 656-9300.

Sincerely,



Ronald M. Bishop, MPH, CIH

ABIH 814

TDSHS No. 105492

Asbestos Exposure Assessment

- a. Installed critical barriers (2 layers of 6 mil thick poly) covering all openings to include all supply and return diffusers and the exterior door.
- b. The room was set up to be placed under negative pressure of at least -0.02 wc using a negative air machine.
- c. A three stage DECON was erected IAW TAHPR.
- d. The simulation was conducted by a TDSHS licensed abatement contractor using licensed supervisor(s) and registered workers. All personnel were current in their respirator fit-testing, medical evaluation, and training. The negative air machine was turned off during the simulation to represent actual conditions.
- e. The PPE included disposable coveralls, half facepiece respirators with P100 filters, and nitrile gloves.
- f. Three (3) inch in diameter cylinders one (1) inch thick were used to surround the attachment location. The cylinders were made from PVC pipe.
- g. The cylinders were placed over the location where the drilling disturbance was to occur and filled with a foamy shaving cream.
- h. After the drilling occurred, the cylinder was removed and the shaving cream wiped with a disposable rag from the wall and cylinder. The shaving cream was disposed of into a properly labelled asbestos waste container for disposal into a regulated disposal facility.
- i. Air monitoring occurred as one personal sample, one area sample, and one sample at the exit to the room.
- j. The samples were analyzed by AEHS, Inc., which is a TDSHS licensed PCM laboratory. All results were less than 0.01 fibers per cubic centimeter and in fact approximately 1 magnitude below the clearance level.
- k. The room was then placed under negative pressure and cleared (clearance) IAW the TAHPR.



DAILY LOG OF ACTIVITY

PROJECT NO: 18-097 DATE: 8/20/2018

LOCATION: 1215 Fair Ave.

CONTRACTOR: TLI SUPERVISOR: Ray M.

ACTIVITY:

0800 - AEHS arrives on site

0815 - Room 210 was occupied so we are drilling holes in 211

0830 - Background pumps are up and running while crew begins to prep.

0845 - Begin paperwork

0900 - Back on prep work.

1000 - Ron Bishop arrives on the job site. / Backgrounds finish running

1015 - crew continues to prep area.

1045 - Pumps have started and work has begun.

1130 - work has finished (all 50 holes have been drilled)

1145 - crew begins cutting out hole where all 50 holes were

1210 - crew has finished cutting hole out of the wall / final clean up

1250 - crew has finished final clean up / AEHS take in pumps for clearance

1300 - All three low-flow pumps have been turned off and collected

Clearance samples have begun

AEHS REPRESENTATIVE SIGNATURE: [Signature]

CREW SIZE: 3 NEGATIVE AIR UNITS: 1 RESPIRATOR TYPE: half/mouth

ACM TO BE REMOVED: Drilling holes

DECON: MANUALLY CONSTRUCTED POP-UP TRAILER

AIR SAMPLES COLLECTED: INSIDE CONTAINMENT [checked] OUTSIDE CONTAINMENT [checked]

NEGATIVE AIR MACHINE _____ DECON _____ BAG OUT _____ BACKGROUND _____

PERSONNEL [checked] PCM CLEARANCE [checked] TEM CLEARANCE _____



DAILY LOG OF ACTIVITY (CONTINUED)

PROJECT NO: 18-097

DATE: 8/20/2018

1430- Samples for clearance are finished and begin reading

1520- Clearance has been achieved and A&H S packs up equipment

1550- A&H S leaves the job site.

1615- A&H S arrives @ offices.

Air Sampling Log

Project Number : 18-097 1215 Fair Ave.

Project Name : 1215 Fair Ave.

Date : 8/20/2018

Sampled By : Chuy Givny

Analyzed By : Chuy Givny

Sample Number	Type	Sample Location Name / SSN	Pump Number	Flow Rate (L/min)	Time		Total Time (min)	Total Volume (L)	Fiber Count	Results (f/cc)	TWA (f/cc)
					Start	Stop					
1	B	Background	2140	14.0	08:30	10:00	90	1266	13.5/100	0.005	/
2	B	Background	1881	14.0	08:30	10:00	90	1260	17/100	0.006	/
3	A	Inside Containment	070	2.0	10:45	12:50	125	256	5/100	0.009	/
4	A	Outside Containment	060	2.0	10:45	12:50	125	250	3.5/100	0.006	/
5	P	Joe Snyder	060	2.0	10:45	12:50	125	250	3/100	0.005	0.002
6	C	Inside Containment	1881	14.0	13:00	14:30	90	1266	16/100	0.006	/
7	C	Outside Containment	2140	14.0	13:00	14:30	90	1260	4/100	0.001	/

Types: A = Area B = Background P = Personnel C = Clearance FB = Field Blank
 Comments :

*Note: TWA calculated for actual exposure time which was greater than 480 minutes (8 hours).
 *Note: TWA calculated using 8 hours (assume that person had zero exposure for balance of the 8 hours).
 *Note: NIOSH Method 7400 used, Estimate LOD: 7 fibers/mm²





Visual/Final Inspection
Asbestos Removal, Renovation, & Demolition

Date: 8/20/2018

Project Number: 18-097

Location: 1215 Fair Ave.

1. Visual

Residual dust on:	Yes	No
Floor	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ceiling	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ventilation Equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pipes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ducts	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lights	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other _____	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Record any other problems encountered: _____

AEHS Representative: Ching Bisy

Owner Representative: _____

Contractor Representative: _____

2. Final Clearance

Air Sampling Date: 8/20/2018 Aggressive Passive _____

Rate: 14.0 Time: 90 Volume: 1260 Analytical Method: PCM

Results: 0.000 f/cc 0.001 f/cc _____ f/cc _____ f/cc _____ f/cc
_____ f/cc _____ f/cc _____ f/cc _____ f/cc _____ f/cc

PCM Clearance Standard: 0.01 f/cc TEM Clearance Standard: 70 Structures/mm²

Date Clearance Standard Met: 8/20/2018

I certify that clearance was achieved

Signature of AEHS Representative: Ching Bisy

Negative Exposure Assessment

Based on the Asbestos Exposure Assessment, this Negative Exposure Assessment is provided in support of the variance request for installing of a new fire alarm system including the attachment of pipe run brackets, smoke alarms, smoke alarm strobes, etc., was conducted. The results depicted that the procedures were at least as protective of public health as the requirements in Texas Asbestos Health Protection Rules – TAHPR §295.60. OPERATIONS: ABATEMENT PRACTICES AND PROCEDURES FOR PUBLIC BUILDINGS.

1. Procedure:

- a. Install critical barriers (2 layers of 6 mil thick poly) covering all openings to include all supply and return diffusers and the exterior door.
- b. Construct a one stage DECON.
- c. Place a drop cloth of six mil thick poly under the area where the penetrations will occur.
- d. Use three (3) inch in diameter cylinders (PVC pipe) one (1) inch thick to surround the attachment location.
- e. The cylinders will be placed over the location where the drilling disturbance will occur and filled with a foamy shaving cream.
- f. After the drilling occurs, the cylinder will be removed and the shaving cream wiped with a disposable rag from the wall and cylinder. The shaving cream will be disposed of into a properly labelled asbestos waste container for disposal into a regulated disposal facility.
- g. Fold the drop cloth inwardly and place into the properly labelled asbestos waste container.
- h. Wet wipe the critical barriers and place into the properly labelled asbestos waste container.
- i. Wet wipe the DECON.
- j. HEPA Vacuum the Room.

2. Worker Protection and Training.

- a. All workers will be trained in asbestos awareness in accordance with OSHA's 29 CFR 1926.1101. The asbestos awareness training will include: Background, Hazards, PPE, and Task Specific procedures.
- b. Personal Protective Equipment will include disposable coveralls and nitrile gloves.

c. All personnel will exit through the single stage DECON by washing all exposed skin after removing of the gloves and coveralls.

3. Occupant Protection.

- a. Critical barriers as per procedure.
- b. DECON as per procedure.
- c. Final cleaning as per procedure.
- d. Wet wipe the critical barriers and place into the properly labelled asbestos waste container.
- e. Wet wipe the DECON.
- f. HEPA Vacuum the Room.

4. Environmental Protection.

- a. Critical barriers as per procedure.
- b. DECON as per procedure.
- c. Final cleaning as per procedure.
- d. Fold the drop cloth inwardly and place into the properly labelled asbestos waste container.



Ronald M. Bishop, MPH, CIH
ABIH 814
TDSHS Asbestos Consultant No. 105492



SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.

1.2 DEFINITIONS

- A. See Division 21 specification (e.g., 211313 – Wet-pipe Sprinkler Systems).
- B. See Division 28 specification (e.g., 284621 - Addressable Fire-Alarm Systems).

1.3 ALLOWANCES

- A. Penetration firestopping Work is a required Work element and shall be part of Contractor's **base bid** for project.

1.4 ACTION SUBMITTALS

Action submittals require submission to and written approval by the Contracting Officer prior to any subsequent required permit submissions and approvals.

Contracting Officer review / approval: provide one (1) electronic PDF copy, electronically bookmarked. No hardcopies required.

Permit / Code Official review / approval: provide quantity and type as directed by Permit / Code Official.

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.5 INFORMATIONAL SUBMITTALS

Information submittals require submission to Contracting Officer for informational purposes only. No explicit approvals are required, unless otherwise noted.

Provide one (1) bound, hardcopies, complete with table of contents and one (1) electronic PDF copy, electronically bookmarked.

- A. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

The following closeout submittals shall be submitted and approved by the Contracting Officer.

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:

- a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."
 - 3) FM Global in its "Building Materials Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of **0.01-inch wg (2.49 Pa)**.
 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
 - a. 2-hr for walls enclosing vertical connecting elements (e.g., elevator hoistway, stairwell, plumbing chase, mechanical chase, etc).
 - b. 1-hr for walls surrounding Dwelling Units.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of **0.01-inch wg (2.49 Pa)**.
 1. F-Rating: At least two hour, but not less than the fire-resistance rating of constructions penetrated.
- D. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E 84.
- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
 1. Permanent forming/damming/backing materials.
 2. Substrate primers.
 3. Collars.
 4. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

2.4 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within **6 inches (150 mm)** of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- B. Proceed with enclosing penetration firestopping systems with other construction only after Contracting Officer has had an opportunity to review the installation and provide Contractor with written notice to proceed with enclosing activities.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

1.2 ALLOWANCES

- A. Gypsum wallboard repair Work is a required Work element and shall be part of Contractor's **base bid** for project.

1.3 UNIT PRICES

- A. Work of this Section is included in Contractor's unit prices.

1.4 ACTION SUBMITTALS

Action submittals require submission to and written approval by the Contracting Officer prior to any subsequent required permit submissions and approvals.

Contracting Officer review / approval: provide one (1) electronic PDF copy, electronically bookmarked. No hardcopies required.

- A. Product Data: For each type of product.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install panels that are wet, moisture damaged, and mold damaged.
 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

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.

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. Thickness: **5/8 inch (15.9 mm)**.
 2. Long Edges: Tapered.
- B. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 1. Core: **5/8 inch (15.9 mm)**, Type X.
 2. Long Edges: Tapered.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 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. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 4. 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 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 OR drying-type, all-purpose 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 OR drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound OR drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound OR drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from **0.033 to 0.112 inch (0.84 to 2.84 mm)** thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch (1.5 mm)** of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft. (0.7 sq. m)** in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch- (6.4- to 9.5-mm-)** wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide **1/4- to 1/2-inch- (6.4- to 12.7-mm-)** wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Type X: as required for patching of cut gypsum board interior surfaces.
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

- a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.
- D. Curved Surfaces:
1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus **12-inch-** (**300-mm-**) long straight sections at ends of curves and tangent to them.
 2. For double-layer construction, fasten base layer to studs with screws **16 inches** (**400 mm**) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced **12 inches** (**300 mm**) o.c.

3.4 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 2: Panels that are substrate for acoustical tile.
 3. Level 3: (none).
 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: (none).
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.5 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.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095123 - ACOUSTICAL TILE CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustical tiles for ceilings.

1.2 ALLOWANCES

- A. Acoustical ceiling tile repair and replacement Work is a required Work element and shall be part of Contractor's **base bid** for project.

1.3 ACTION SUBMITTALS

- A. (none)

1.4 INFORMATIONAL SUBMITTALS

- A. (none)

1.5 CLOSEOUT SUBMITTALS

The following closeout submittals shall be submitted and approved by the Contracting Officer.

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size tiles equal to 10.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

- B. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

PART 2 - PRODUCTS

2.1 ACOUSTICAL TILES, GENERAL

- A. After the demolition of the existing fire alarm system and the installation of the new sprinkler system are complete, replace all ceiling tiles that contained fire alarm devices or were damaged during the installation.
- B. Products:
 - 1. Armstrong 942 Ceiling Panel
 - a. Finish: Textured
 - b. Dimensions: 24" x 48" x 5/8" nominal
 - 2. Armstrong 949 Ceiling Panel
 - a. Finish: Textured
 - b. Dimensions: 24" x 24" x 5/8" nominal
- C. Source Limitations:
 - 1. Acoustical Ceiling Tile: Obtain each type from single source from single manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CLEANING

- A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095123

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on interior substrates.

1.2 ALLOWANCES

- A. Interior painting Work is a required Work element and shall be part of Contractor's **base bid** for project.

1.3 ACTION SUBMITTALS

- A. (none)

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than **1 gal. (3.8 L)** of each material and color applied.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F (7 deg C)**.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F (10 and 35 deg C)**.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than **5 deg F (3 deg C)** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Products:
 - 1. Obtain paint color specification from owner.

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. Concrete: 12 percent.
 - 2. Fiber-Cement Board: 12 percent.
 - 3. Masonry (Clay and CMUs): 12 percent.
 - 4. Wood: 15 percent.
 - 5. Gypsum Board: 12 percent.
 - 6. Plaster: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.
- E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- G. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- G. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in finished spaces:
 - a. Metal conduit.
 - b. Sprinkler piping and valves.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

SECTION 210523 - GENERAL-DUTY VALVES FOR FIRE PROTECTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Two-piece ball valves with indicators.
2. Bronze butterfly valves with indicators.
3. Iron butterfly valves with indicators.
4. Check valves.
5. Bronze OS&Y gate valves.
6. Iron OS&Y gate valves.
7. NRS gate valves.
8. Indicator posts.
9. Trim and drain valves.

1.2 DEFINITIONS

- A. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- B. NRS: Nonrising stem.
- C. OS&Y: Outside screw and yoke.
- D. SBR: Styrene-butadiene rubber.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of valve.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, and weld ends.
3. Set valves open to minimize exposure of functional surfaces.

B. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.
- D. Protect flanges and specialties from moisture and dirt.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. UL Listed: Valves shall be listed in UL's "Online Certifications Directory" under the headings listed below and shall bear UL mark:
 - 1. Main Level: HAMV - Fire Main Equipment.
 - a. Level 1: HCBZ - Indicator Posts, Gate Valve.
 - b. Level 1: HLOT - Valves.
 - 1) Level 3: HLUG - Ball Valves, System Control.
 - 2) Level 3: HLXS - Butterfly Valves.
 - 3) Level 3: HMER - Check Valves.
 - 4) Level 3: HMRZ - Gate Valves.
 - 2. Main Level: VDGT - Sprinkler System & Water Spray System Devices.
 - a. Level 1: VQGU - Valves, Trim and Drain.
- B. FM Global Approved: Valves shall be listed in its "Approval Guide," under the headings listed below:
 - 1. Automated Sprinkler Systems:
 - a. Indicator posts.
 - b. Valves.
 - 1) Gate valves.
 - 2) Check valves.
 - a) Single check valves.
 - 3) Miscellaneous valves.
- C. Source Limitations for Valves: Obtain valves for each valve type from single manufacturer.
- D. ASME Compliance:
 - 1. ASME B16.1 for flanges on iron valves.
 - 2. ASME B1.20.1 for threads for threaded-end valves.
 - 3. ASME B31.9 for building services piping valves.
- E. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.

- F. NFPA Compliance: Comply with NFPA 24 for valves.
- G. Valve Pressure Ratings: Not less than the minimum pressure rating indicated or higher as required by system pressures.
- H. Valve Sizes: Same as upstream piping unless otherwise indicated.
- I. Valve Actuator Types:
 - 1. Worm-gear actuator with handwheel for quarter-turn valves, except for trim and drain valves.
 - 2. Handwheel: For other than quarter-turn trim and drain valves.
 - 3. Handlever: For quarter-turn trim and drain valves **NPS 2 (DN 50)** and smaller.

2.2 TWO-PIECE BALL VALVES WITH INDICATORS

A. Description:

- 1. UL 1091, except with ball instead of disc and FM Global standard for indicating valves (butterfly or ball type), Class Number 1112.
- 2. Minimum Pressure Rating: **300 psig (1200 kPa)**.
- 3. Body Design: Two piece.
- 4. Body Material: Forged brass or bronze.
- 5. Port Size: Full or standard.
- 6. Seats: PTFE.
- 7. Stem: Bronze or stainless steel.
- 8. Ball: Chrome-plated brass.
- 9. Actuator: Worm gear or traveling nut.
- 10. Supervisory Switch: Internal or external.
- 11. Lockable in the default position.
- 12. End Connections for Valves **NPS 1 (DN 25)** through **NPS 2 (DN 50)**: Threaded ends.
- 13. End Connections for Valves **NPS 2-1/2 (DN 65)**: Grooved ends.

2.3 BRONZE BUTTERFLY VALVES WITH INDICATORS

A. Description:

- 1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 1112.
- 2. Minimum: Pressure rating: **300 psig (1200 kPa)**.
- 3. Body Material: Bronze.
- 4. Seat Material: EPDM.
- 5. Stem Material: Bronze or stainless steel.
- 6. Disc: [**Bronze**] [**Stainless steel**][**with EPDM coating**].
- 7. Actuator: Worm gear or traveling nut.
- 8. Supervisory Switch: Internal or external.
- 9. Lockable in the default position.
- 10. Ends Connections for Valves **NPS 1 (DN 25)** through **NPS 2 (DN 50)**: Threaded ends.
- 11. Ends Connections for Valves **NPS 2-1/2 (DN 65)**: Grooved ends.

2.4 IRON BUTTERFLY VALVES WITH INDICATORS

A. Description:

1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 112.
2. Minimum Pressure Rating: 300 psig (1200 kPa).
3. Body Material: Cast or ductile iron with nylon, EPDM, epoxy, or polyamide coating.
4. Seat Material: EPDM.
5. Stem: Stainless steel.
6. Disc: Ductile iron, nickel plated.
7. Actuator: Worm gear or traveling nut.
8. Supervisory Switch: Internal or external.
9. Lockable in the default position.
10. Body Design: Grooved-end connections.

2.5 CHECK VALVES

A. Description:

1. Standard: UL 312 and FM Global standard for swing check valves, Class Number 1210.
2. Minimum Pressure Rating: 300 psig (1200 kPa).
3. Type: Single swing check.
4. Body Material: Cast iron, ductile iron, or bronze.
5. Clapper: Bronze, ductile iron, or stainless steel with elastomeric seal.
6. Clapper Seat: Brass, bronze, or stainless steel.
7. Hinge Shaft: Bronze or stainless steel.
8. Hinge Spring: Stainless steel.
9. End Connections: Flanged, grooved, or threaded.

2.6 BRONZE OS&Y GATE VALVES

A. Description:

1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).
2. Minimum Pressure Rating: 300 psig (1200 kPa).
3. Body and Bonnet Material: Bronze or brass.
4. Wedge: One-piece bronze or brass.
5. Wedge Seat: Bronze.
6. Stem: Bronze or brass.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End Connections: Threaded.

2.7 IRON OS&Y GATE VALVES

A. Description:

1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).
2. Minimum Pressure Rating: 300 psig (1200 kPa).
3. Body and Bonnet Material: Cast or ductile iron.
4. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
6. Stem: Brass or bronze.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End Connections: Flanged or Grooved.

2.8 NRS GATE VALVES

A. Description:

1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).
2. Minimum Pressure Rating: 300 psig (1200 kPa).
3. Body and Bonnet Material: Cast or ductile iron.
4. Wedge: Cast or ductile iron with elastomeric coating.
5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
6. Stem: Brass or bronze.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End Connections: Flanged or Grooved.

2.9 TRIM AND DRAIN VALVES

A. Ball Valves:

1. Description:
 - a. Pressure Rating: 300 psig (2070 kPa) <Insert value>.
 - b. Body Design: Two piece.
 - c. Body Material: Forged brass or bronze.
 - d. Port size: Full or standard.
 - e. Seats: PTFE.
 - f. Stem: Bronze or stainless steel.
 - g. Ball: Chrome-plated brass.
 - h. Actuator: Handlever.
 - i. Lockable in the default position.
 - j. End Connections for Valves NPS 1 (DN 25) through NPS 2-1/2 (DN 65): Threaded ends.
 - k. End Connections for Valves NPS 1-1/4 and NPS 2-1/2 (DN 32 and DN 65): Grooved ends.

B. Angle Valves:

1. Description:
 - a. Pressure Rating: 300 psig (2070 kPa).

- b. Body Material: Brass or bronze.
 - c. Ends: Threaded.
 - d. Stem: Bronze.
 - e. Disc: Bronze.
 - f. Packing: Asbestos free.
 - g. Handwheel: Malleable iron, bronze, or aluminum.
 - h. Lockable in the default position.
- C. Globe Valves:
- 1. Description:
 - a. Pressure Rating: 300 psig (2070 kPa).
 - b. Body Material: Bronze with integral seat and screw-in bonnet.
 - c. Ends: Threaded.
 - d. Stem: Bronze.
 - e. Disc Holder and Nut: Bronze.
 - f. Disc Seat: Nitrile.
 - g. Packing: Asbestos free.
 - h. Handwheel: Malleable iron, bronze, or aluminum.
 - i. Lockable in the default position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 GENERAL REQUIREMENTS FOR VALVE INSTALLATION

- A. Comply with requirements in the following Sections for specific valve installation requirements and applications:
 - 1. Section 211313 "Wet-Pipe Sprinkler Systems" for application of valves in wet-pipe, fire-suppression sprinkler systems.

- B. Install listed fire-protection shutoff valves supervised-open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Install valves having threaded connections with unions at each piece of equipment arranged to allow easy access, service, maintenance, and equipment removal without system shutdown. Provide separate support where necessary.
- E. Install valves in horizontal piping with stem at or above the pipe center.
- F. Install valves in position to allow full stem movement.
- G. Install listed fire-protection shutoff valves supervised-open, located to control sources of water supply except from fire-department connections.
- H. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.

END OF SECTION 210523

SECTION 211313 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Specialty valves.
3. Sprinklers.
4. Alarm devices.
5. Pressure gages.

B. Related Requirements:

1. Section 230523 "General-Duty Valves for Water-Based Fire-Suppression Piping" for ball, butterfly, check, gate, post-indicator, and trim and drain valves.

1.3 APPLICABLE CODES AND STANDARDS

The following lists codes and standards that are specifically applicable to work performed under this contract.

Department of Housing and Urban Development

- A. Code of Federal Regulations, Title 24, Housing and Urban Development (HUD)
- B. Uniform Federal Accessibility Standards (UFAS)

International Code Council (ICC)

- C. International Building Code (IBC), 2015 Edition
- D. International Fire Code (IFC), 2015 Edition

Local Code Requirements

- E. San Antonio Codes and Ordinances, Chapter 10, Amendments to Building Related Codes (SACO)
- F. San Antonio Codes and Ordinances, Chapter 11, Amendments to the International Fire Code (SACF)

National Fire Protection Association (NFPA)

- G. NFPA 13, Installation of Sprinkler Systems, 2013 Edition
- H. NFPA 70, National Electric Code, 2014 Edition
- I. NFPA 72, National Fire Alarm Code, 2013 Edition

1.4 DEFINITIONS

- A. High-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure higher than standard **175 psig (1200 kPa)**, but not higher than **300 psig (2070 kPa)**.
- B. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of **175-psig (1200-kPa)** maximum.

1.5 ACTION SUBMITTALS

Owner review and approval is required for Action Submittals prior to issuance to local permit office.

- A. Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, pressure loss at anticipated water flow rates, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For wet-pipe sprinkler systems.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include pipe sizes, routing, configuration.
 - 3. Provide isometrics of fire pump room configuration.
 - 4. Include diagrams for power, signal, and control wiring.
 - 5. Include hydraulic calculations for both the NFPA 13 most remote sprinkler discharge area as well as the standpipe hydraulic flow calculations.
 - 6. Include field test report for hydrant flow test data tested within the previous six months of the notice to proceed on sprinkler design.
 - 7. Shop drawings shall be submitted to and approved by the AHJ prior to fabrication and installation efforts. The package shall comply with all requirements of the AHJ and shall be signed and sealed by the individual in responsible charge of Shop Drawing preparation efforts.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Design Data:

1. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations.
 - C. Welding certificates, if applicable.
 - D. Field Test Reports:
 1. Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
 2. Fire-hydrant flow test report.
 - E. Field quality-control reports.
- 1.7 CLOSEOUT SUBMITTALS
- A. Operation and Maintenance Data: For wet-pipe sprinkler systems and specialties to include in emergency, operation, and maintenance manuals. Provide three hard copies of operational and maintenance manual and two digital copies.
 - B. Record Drawings. Prepare post-construction record drawings reflective of "as-built" conditions for all system components. Include updated hydraulic calculations where system configuration has been modified and would affect results. Drawings shall be prepared and submitted to the Owner in both AutoCAD and PDF format. Each drawing shall be signed and sealed by the Qualified Installer.
- 1.8 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with permanent placard describing contents.
 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of 24 spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.
- 1.9 QUALITY ASSURANCE
- A. Installer Qualifications:
 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified individual certified to minimum NICET Level III in Water-Based Systems.

- b. Texas Requirement: qualified individual shall also hold an Responsible Managing Employee General License (RME-G), issued by the State Fire Marshal's Office.
- B. Welding Qualifications (if applicable): Qualify procedures and operators according to 2010 ASME Boiler and Pressure Vessel Code.

1.10 FIELD CONDITIONS

- A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:
 - 1. Notify Owner's representative no fewer than one week in advance of proposed interruption of sprinkler service.
 - 2. Do not proceed with interruption of sprinkler service without Owner's written permission.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
 - 1. NFPA 13.
- B. High-Pressure Piping System Component: Listed for 300-psig (2070-kPa) working pressure.
- C. Delegated Design: Engage a licensed, qualified individual to design wet-pipe sprinkler systems.
 - 1. Contractor shall obtain new hydrant flow test data. The following flow test data is furnished for informational purposes only:
 - a. Date: 2015
 - b. Time: Unknown
 - c. Performed by: Unknown. Data provided by San Antonio Water System (SAWS).
 - d. Location of Residual Fire Hydrant R: Unknown.
 - e. Location of Flow Fire Hydrant F: Directly across the street of 1215 Fair Avenue.
 - f. Static Pressure at Residual Fire Hydrant R: 73 psig.
 - g. Measured Flow at Flow Fire Hydrant F: 1365 gpm.
 - h. Residual Pressure at Residual Fire Hydrant R: 70 psig.
 - 2. Sprinkler system design shall be approved by authorities having jurisdiction.
 - a. Margin of Safety for Available Water Flow and Pressure: 10 percent or 5 psi, whichever is greater, including losses through water-service piping, valves, and backflow preventers.
 - b. Sprinkler Occupancy Hazard Classifications:
 - 1) Building Service Areas: Ordinary Hazard, Group 1.

- 2) Electrical Equipment Rooms: Ordinary Hazard, Group 1.
 - 3) General Storage Areas: Ordinary Hazard, Group 1.
 - 4) Laundries: Ordinary Hazard, Group 1.
 - 5) Libraries except Stack Areas: Light Hazard.
 - 6) Machine Shops: Ordinary Hazard, Group 2.
 - 7) Mechanical Equipment Rooms: Ordinary Hazard, Group 1.
 - 8) Office and Public Areas: Light Hazard.
 - 9) Residential Living Areas: Light Hazard.
3. Minimum Density for Automatic-Sprinkler Piping Design:
 - a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. (4.1 mm/min. over 139-sq. m) area.
 - b. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. (6.1 mm/min. over 139-sq. m) area.
 - c. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. (8.1 mm/min. over 139-sq. m) area.
 - d. Special Occupancy Hazard: As determined by authorities having jurisdiction.
 4. Maximum Protection Area per Sprinkler: According to UL listing.
 5. Maximum Protection Area per Sprinkler:
 - a. Residential Areas: 225 sq. ft. (20.9 sq. m).
 - b. Office Spaces: 225 sq. ft. (20.9 sq. m).
 - c. Storage Areas: 130 sq. ft. (12.1 sq. m).
 - d. Mechanical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
 - e. Electrical Equipment Rooms: 130 sq. ft. (12.1 sq. m).
 - f. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
 6. Standpipe system design shall be approved by authorities having jurisdiction.
 - a. Margin of Safety for Available Water Flow and Pressure for Standpipe systems: 10 psi, i.e., provide hydraulic calculations demonstrating 110 psi out of calculated standpipe hose valves.

2.2 STEEL PIPE AND FITTINGS

- A. Note: all pipe and pipe fittings must be rated for use in a high pressure system up to 300 psi.
- B. Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.
- C. Schedule 10, Black-Steel Pipe: ASTM A 135/A 135M or ASTM A 795/A 795M, Schedule 10 in NPS 5 (DN 125) and smaller; and NFPA 13-specified wall thickness in NPS 6 to NPS 10 (DN 150 to DN 250), plain end.
- D. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- E. Galvanized-Steel Couplings: ASTM A 865/A 865M, threaded.
- F. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

- G. Malleable- or Ductile-Iron Unions: UL 860.
- H. Cast-Iron Flanges: ASME 16.1, Class 125.
- I. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
 - 1. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, **1/8 inch (3.2 mm)** thick or EPDM rubber gasket.
 - a. Class 125 and Class 250, Cast-Iron, Flat-Face Flanges: Full-face gaskets.
 - b. Class 150 and Class 300, Ductile-Iron or -Steel, Raised-Face Flanges: Ring-type gaskets.
 - 2. Metal, Pipe-Flange Bolts and Nuts: Carbon steel unless otherwise indicated.
- J. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
 - 1. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- K. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Pressure Rating: **300-psig (2070-kPa)** minimum.
 - 2. Painted Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting, with dimensions matching steel pipe.
 - 3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213 rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.3 SPECIALTY VALVES

- A. Standpipe hose valves
 - 1. Provide 2-½ inch standpipe hose valves at each landing level of the north and south stairwells as illustrated in the contract drawings.
 - 2. Standpipe hose valve pressure losses shall facilitate an outlet pressure of 110 psi when provided with the hydraulically calculated inlet pressure and flow rate. Ensure pressure losses caused by the standpipe hose valve are incorporated into hydraulic calculations.
 - 3. Provide chain-attached 1-1/2 inch screw adapter at each hose valve.
 - 4. Based on hydraulic calculations provided pressure reducing valves ahead of standpipe hose valve if inlet pressure provided by system exceed maximum allowable inlet pressures of the standpipe hose valve.
 - 5. Lockable in the closed position.
 - 6. Basis of design: Zurn ZW4004G (substitutes acceptable).
- B. Fire Department Connections
 - 1. Provide Siamese fire department connection located in accordance with contract drawings.
 - 2. Standard: UL 405.
 - 3. Type: Exposed, projecting, for wall mounting.
 - 4. Pressure Rating: **300 psig (1200 kPa)** minimum.
 - 5. Body Material: Corrosion-resistant metal.

6. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
7. Caps: Brass, lugged type, with gasket and chain.
8. Escutcheon Plate: Round, brass, wall type.
9. Outlet: Back, with pipe threads.
10. Number of Inlets: Two
11. Escutcheon Plate Marking: Similar to "AUTO SPKR & STANDPIPE."
12. Finish: Rough brass or bronze.
13. Outlet Size: **NPS 4 (DN 100)**.

2.4 SPRINKLER PIPING SPECIALTIES

- A. Branch Outlet Fittings:
 1. Standard: UL 213.
 2. Pressure Rating: **300 psig (2070 kPa)**.
 3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
 4. Type: Mechanical-tee and -cross fittings.
 5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
 6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
 7. Branch Outlets: Grooved or threaded.
- B. Flow Detection and Test Assemblies:
 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
 2. Pressure Rating: **300 psig (2070 kPa)**.
 3. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
 4. Size: Same as connected piping.
 5. Inlet and Outlet: Threaded or grooved.
- C. Sprinkler Inspector's Test Fittings:
 1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
 2. Pressure Rating: **300 psig (2070 kPa)**.
 3. Body Material: Cast- or ductile-iron housing with sight glass.
 4. Size: Same as connected piping.
 5. Inlet and Outlet: Threaded.
- D. Adjustable Drop Nipples:
 1. Standard: UL 1474.
 2. Pressure Rating: **300 psig (2070 kPa)**.
 3. Body Material: Steel pipe with EPDM-rubber O-ring seals.
 4. Size: Same as connected piping.
 5. Length: Adjustable.
 6. Inlet and Outlet: Threaded.
- E. Flexible Sprinkler Hose Fittings:
 1. Standard: UL 1474.
 2. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.

3. Pressure Rating: 300 psig (2070 kPa).
4. Size: Same as connected piping, for sprinkler.

2.5 SPRINKLERS

- A. Listed in UL's "Fire Protection Equipment Directory."
- B. Pressure Rating for Automatic Sprinklers: 300-psig (2070-kPa) minimum.
- C. Automatic Sprinklers with Heat-Responsive Element:
 1. Characteristics: Quick response, nominal 1/2-inch (12.7-mm) orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.
- D. Sprinkler Finishes:
 1. Sprinklers in finished spaces with acoustical ceiling tile: Concealed pendant with white finish.
 2. Exposed sidewall sprinklers in finished spaces: rough bronze finish.
 3. Exposed sprinklers in unfinished spaces such as mechanical or electrical rooms: rough bronze finish.
- E. Sprinkler Guards:
 1. Standard: UL 199.
 2. Type: Wire cage with fastening device for attaching to sprinkler.

2.6 ALARM DEVICES

- A. Alarm-device types shall match piping and equipment connections.
- B. Water-Flow Indicators:
 1. Standard: UL 346.
 2. Water-Flow Detector: Electrically supervised.
 3. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
 4. Type: Paddle operated.
 5. Pressure Rating: 300 psig (1725 kPa).
 6. Design Installation: Horizontal or vertical.
- C. Valve Supervisory Switches:
 1. Standard: UL 346.
 2. Type: Electrically supervised.
 3. Components: Single-pole, double-throw switch with normally closed contacts.
 4. Design: Signals that controlled valve is in other than fully open position.
 5. 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.

2.7 PRESSURE GAGES

- A. Standard: UL 393.
- B. Dial Size: 3-1/2- to 4-1/2-inch (90- to 115-mm) diameter.
- C. Pressure Gage Range: 0 to 300 psig (0 to 2070 kPa).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 WATER-SUPPLY CONNECTIONS

- A. Connect sprinkler piping to building's interior water-distribution piping.
- B. Install shutoff valve, backflow preventer, pressure gages, drain, and other accessories indicated at connection to water-distribution piping.

3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated on approved working plans.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
 - 2. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.
- B. Piping Standard: Comply with NFPA 13 requirements for installation of sprinkler piping.
- C. Seismic restraint: not applicable to this project location.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 (DN 50) and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 (DN 65) and larger end connections.

- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.
- J. Install automatic (ball drip) drain valve at each check valve for fire-department connection, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- K. Install alarm devices in piping systems.
- L. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
- M. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than **NPS 1/4 (DN 8)** and with soft-metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they are not subject to freezing.
- N. Fill sprinkler system piping with water.
- O. Install electric heating cables and pipe insulation on sprinkler piping in areas subject to freezing. Comply with requirements for heating cables in Section 210533 "Heat Tracing for Fire-Suppression Piping" and for piping insulation in Section 210700 "Fire-Suppression Systems Insulation."
- P. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- Q. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- R. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes **NPS 2 (DN 50)** and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having **NPS 2-1/2 (DN 65)** and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
 - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- I. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- J. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.

3.5 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve. Valves located in areas accessible to building residents shall be locked in the normal position. Locked sprinkler valves shall all utilize a standard key. Provide a copy of the key for the building knox box.
- C. Install check valve in each water-supply connection. Install backflow preventers instead of check valves in potable-water-supply sources.
- D. Specialty Valves:
 - 1. Install sprinkler zone manual air vent valves (e.g., inspector's test fitting or equivalent) at the end of each sprinkler zone main. Bleed air from sprinkler zone into a portable drum or other capture device in case of accidental water discharge.

3.6 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.
- C. Install sprinklers into flexible, sprinkler hose fittings, and install hose into listed bracket on ceiling grid.

3.7 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. SAHA Requirement: Provide labeling on all system piping larger than two (2) inches indicating system name “SPRINKLER WATER” and flow direction (e.g., chevron arrow). Provide labeling on both sides within three (3) feet of a penetrated surface (e.g., walls, floors). Provide additional labeling such that labels are no further than twenty (20) feet between labels.

3.8 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Hydrostatic Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 3. Coordinate with fire-alarm tests. Operate as required.
 - 4. Coordinate with fire-pump tests. Operate as required.
 - 5. Verify that equipment hose threads are same as local fire department equipment.
- B. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.9 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish.

3.10 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain specialty valves and pressure-maintenance pumps.

3.11 PIPING SCHEDULE

- A. High-pressure, wet-pipe sprinkler system, **NPS 2 (DN 50)** and smaller, shall be one of] the following:
1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 2. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 3. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- B. High-pressure, wet-pipe sprinkler system, **NPS 2-1/2 and larger (DN 65 to DN 100)**, shall be one of] the following:
1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 2. Standard-weight, black-steel pipe with cut- or roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 3. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
 4. Schedule 10 black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 5. Schedule 10 black-steel pipe with plain ends; welding fittings; and welded joints.

3.12 SPRINKLER SCHEDULE

- A. Note: all sprinklers should be of the quick response type throughout the building.
- B. Use sprinkler types in subparagraphs below for the following applications:
1. Rooms without Ceilings: Upright sprinklers.
 2. Rooms with Suspended Ceilings: Concealed sprinklers.
 3. Wall Mounting: Sidewall sprinklers.
 4. Spaces Subject to Freezing: Upright sprinklers.
 5. Special Applications: Extended-coverage where indicated.
- C. Provide sprinkler types in subparagraphs below with finishes indicated.
1. Concealed Sprinklers: Rough bronze, with factory finished white cover plate.
 2. Sidewall sprinklers: Rough bronze finish.
 3. Upright Sprinklers: Rough bronze finish.

END OF SECTION 211313

SECTION 213113 - ELECTRIC-DRIVE, CENTRIFUGAL FIRE PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Specification Section 211313 WET-PIPE SPRINKELR SYSTEMS

1.2 SUMMARY

- A. Section Includes:
 - 1. Horizontally mounted, single-stage, split-case fire pumps.
 - 2. Fire-pump accessories and specialties.
 - 3. Flowmeter systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, performance curves, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For fire pumps, motor drivers, and fire-pump accessories and specialties.
 - 1. Include plans, elevations, sections, and mounting and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of fire pump, from manufacturer.
- B. Source quality-control reports.
- C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire pumps to include in operation and maintenance manuals. Provide three hard copies of operational and maintenance manual and two digital copies.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Comply with NFPA 20.
- B. Pump Equipment, Accessory, and Specialty Pressure Rating: 300 psig (1200 kPa) minimum unless higher pressure rating is indicated.
- C. 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.
- D. Delegated Design: Engage a licensed, qualified individual to coordinate fire pump to the sprinkler/standpipe hydraulic requirements. Hydraulic performance characteristics noted in this specification shall be modified as necessary to achieve a code compliant system.

2.2 GENERAL REQUIREMENTS FOR CENTRIFUGAL FIRE PUMPS

- A. Description: Factory-assembled and -tested fire-pump and driver unit.
- B. Base: Fabricated and attached to fire-pump and driver unit, with reinforcement to resist movement of pump during seismic events when base is anchored to building substrate.
- C. Finish: Red paint applied to factory-assembled and -tested unit before shipping.

2.3 HORIZONTALLY MOUNTED, SINGLE-STAGE, SPLIT-CASE FIRE PUMPS

- A. Basis of design: Aurora 5"-1822BF (substitutes acceptable).
- B. Pump:
 - 1. Standard: UL 448, for split-case pumps for fire service.
 - 2. Casing: Axially split case, cast iron, with ASME B16.1 pipe-flange connections.
 - 3. Impeller: Double suction, cast bronze, statically and dynamically balanced, and keyed to shaft.
 - 4. Wear Rings: Replaceable bronze.
 - 5. Shaft and Sleeve: Alloy steel shaft with bronze sleeve.
 - a. Shaft Bearings: Grease-lubricated ball bearings in cast-iron housing.
 - b. Seals: Stuffing box with minimum of four rings of graphite-impregnated braided yarn and bronze packing gland.
 - 6. Mounting: Pump and driver shafts are horizontal, with pump and driver on same base.
- C. Coupling: Flexible and capable of absorbing torsional vibration and shaft misalignment. Include metal coupling guard.
- D. Driver:

1. Standard: UL 1004A.
2. Type: Electric motor; NEMA MG 1, polyphase Design B.

E. Capacities and Characteristics:

1. Rated Capacity: 1000 gpm.
2. Total Rated Head: 168 psi
3. Inlet Flange: Class 300.
4. Outlet Flange: Class 300.
5. Suction Head Available at Pump: Determine through hydrant flow test data. Preliminary numbers estimate 65 psi.
6. Motor Horsepower: 150 hp.
7. Motor Speed: 3560 rpm.
8. Electrical Characteristics:
 - a. Volts: 208 V.
 - b. Phase: Three.
 - c. Hertz: 60.
 - d. Maximum Overcurrent Protection: 2170 A.
9. Pump-Start, Pressure-Switch Setting: 230 psig.
10. Pump-Stop, Pressure-Switch Setting: 240 psig.

2.4 FIRE-PUMP ACCESSORIES AND SPECIALTIES

- A. Automatic Air-Release Valves: Comply with NFPA 20 for installation in fire-pump casing.
- B. Circulation Relief Valves: UL 1478, brass, spring loaded; for installation in pump discharge piping.
- C. Relief Valves:
 1. Description: UL 1478, bronze or cast iron, spring loaded; for installation in fire-suppression water-supply piping.
- D. Inlet Fitting: Eccentric tapered reducer at pump suction inlet.
- E. Outlet Fitting: Concentric tapered reducer at pump discharge outlet.
- F. Discharge Cone: Open type.
- G. Hose Valve Manifold Assembly:
 1. Standard: Comply with requirements in NFPA 20.
 2. Header Pipe: ASTM A 53/A 53M, Schedule 40, galvanized steel, with ends threaded according to ASME B1.20.1.
 3. Header Pipe Fittings: ASME B16.4, galvanized cast-iron threaded fittings.
 4. Automatic Drain Valve: UL 1726.
 5. Manifold:

- a. Test Connections: Comply with UL 405; however, provide outlets without clappers instead of inlets.
- b. Body: Flush type, brass or ductile iron, with number of outlets required by NFPA 20.
- c. Nipples: ASTM A 53/A 53M, Schedule 40, black-steel pipe, with ends threaded according to ASME B1.20.1.
- d. Adapters and Caps with Chain: Brass or bronze, with outlet threaded according to NFPA 1963 and matching local fire-department threads.
- e. Escutcheon Plate: Brass or bronze; rectangular.
- f. Hose Valves: UL 668, bronze, with outlet threaded according to NFPA 1963 and matching local fire-department threads.
- g. Exposed Parts Finish: Polished, chrome plated.
- h. Escutcheon Plate Marking: Equivalent to "FIRE PUMP TEST."

2.5 FLOWMETER SYSTEMS

- A. Description: UL-listed or FM-Approved, fire-pump flowmeter system able to indicate flow to not less than 175 percent of fire-pump rated capacity.
- B. Pressure Rating: 250 psig (1725 kPa).
- C. Sensor: Annubar probe, orifice plate, or venturi unless otherwise indicated. Sensor size shall match pipe, tubing, flowmeter, and fittings.
- D. Permanently Mounted Flowmeter: Compatible with flow sensor; with dial not less than 4-1/2 inches (115 mm) in diameter. Include bracket or device for wall mounting.
 1. Tubing Package: NPS 1/8 or NPS 1/4 (DN 6 or DN 10) [soft copper] [or] [plastic] tubing with copper or brass fittings and valves.

2.6 GROUT

- A. Standard: ASTM C 1107, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink and recommended for interior and exterior applications.
- C. Design Mix: 5000-psi (34-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.7 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect fire pumps according to UL 448 requirements for "Operation Test" and "Manufacturing and Production Tests."
 1. Verification of Performance: Rate fire pumps according to UL 448.
- B. Fire pumps will be considered defective if they do not pass tests and inspections.

- C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine equipment bases and anchorage provisions, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting performance of fire pumps.
- B. Examine roughing-in for fire-suppression piping systems to verify actual locations of piping connections before fire-pump installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Fire-Pump Installation Standard: Comply with NFPA 20 for installation of fire pumps, relief valves, and related components.
- B. Equipment Mounting:
 - 1. Install fire pumps on cast-in-place concrete equipment bases, minimum five inch thickness.
- C. Install fire-pump suction and discharge piping equal to or larger than sizes required by NFPA 20.
- D. Support piping and pumps separately, so weight of piping does not rest on pumps.
- E. Install valves that are same size as connecting piping. Comply with requirements for fire-protection valves specified in Section 211313 "Wet-Pipe Sprinkler Systems."
- F. Install pressure gages on fire-pump suction and discharge flange pressure-gage tappings. Comply with requirements for pressure gages specified in Section 211313 "Wet-Pipe Sprinkler Systems."
- G. Install piping hangers and supports, anchors, valves, gages, and equipment supports according to NFPA 20.
- H. Install flowmeters and sensors. Install flowmeter-system components and make connections according to NFPA 20 and manufacturer's written instructions.
- I. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not factory mounted. Furnish copies of manufacturers' wiring diagram submittals to electrical Installer.
- J. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

3.3 ALIGNMENT

- A. Align split-case pump and driver shafts after complete unit has been leveled on concrete base, grout has set, and anchor bolts have been tightened.
- B. After alignment is correct, tighten anchor bolts evenly. Fill baseplate completely with grout, with metal blocks and shims or wedges in place. Tighten anchor bolts after grout has hardened. Check alignment and make required corrections.
- C. Align piping connections.
- D. Align pump and driver shafts for angular and parallel alignment according to HI 1.4 and to tolerances specified by manufacturer.

3.4 CONNECTIONS

- A. Comply with requirements for piping and valves specified in Section 211313 "Wet-Pipe Sprinkler Systems." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to pumps and equipment to allow service and maintenance.
- C. Connect relief-valve discharge to drainage piping or point of discharge.
- D. Connect flowmeter-system meters, sensors, and valves to tubing.
- E. Connect fire pumps to their controllers.

3.5 IDENTIFICATION

- A. Identify system components. Comply with requirements for fire-pump marking according to NFPA 20.

3.6 FIELD QUALITY CONTROL

- A. Test each fire pump with its controller as a unit.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections
 1. After installing components, assemblies, and equipment, including controller, test for compliance with requirements.
 2. Test according to NFPA 20 for acceptance and performance testing.
 3. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 4. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Components, assemblies, and equipment will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. Furnish fire hoses in number, size, and length required to reach storm drain or other acceptable location to dispose of fire-pump test water. Hoses are for tests only and do not convey to Owner.

END OF SECTION 213113

SECTION 213413 - PRESSURE-MAINTENANCE PUMPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vertical, multistage, pressure-maintenance pumps.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rated capacities, operating characteristics, performance curves, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For pumps, accessories, and specialties.

1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For pumps to include in operation and maintenance manuals. Provide 3 hard copies and 2 digital copies of operation and maintenance materials.

PART 2 - PRODUCTS

2.1 VERTICAL, MULTISTAGE, PRESSURE-MAINTENANCE PUMPS

A. Basis of design: Aurora PVMX1-19

B. Description: Factory-assembled and -tested, multistage, barrel-type vertical pump as defined in HI 2.1-2.2 and HI 2.3; designed for surface installation with pump and motor direct coupled and mounted vertically.

C. Pump Construction:

1. Barrel: Stainless steel.
 2. Suction and Discharge Chamber: Cast iron with flanged inlet and outlet.
 3. Pump Head/Motor Mount: Cast iron.
 4. Impellers: Stainless steel, balanced, and keyed to shaft.
 5. Pump Shaft: Stainless steel.
 6. Seal: Mechanical type with carbon rotating face and silicon-carbide stationary seat.
 7. Wear Rings: Teflon.
 8. Intermediate Chamber Bearings: Aluminum-oxide ceramic or bronze.
 9. Chamber-Base Bearing: Tungsten carbide.
 10. O-Rings: EPDM.
- D. 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.
- E. Motor: Single speed with permanently lubricated ball bearings and rigidly mounted to pump head. Comply with requirements in Section 210513 "Common Motor Requirements for Fire Suppression Equipment."
- F. Power Cord: Factory-connected to motor for field connection to controller and at least **10 feet (3 m)** long.
- G. Nameplate: Permanently attached to pump and indicating capacity and characteristics.
- H. Capacities and Characteristics:
1. Rated Capacity: 10.
 2. Total Dynamic Head: 178 psi
 3. Working Pressure: **300 psig (2070 kPa)**.
 4. Inlet and Outlet Size: **NPS 1-1/4 (DN 32)**.
 5. Discharge and Suction Flanges: Class 300 .
 6. Suction Head Available at Pump: 65 psi.
 7. Motor Horsepower: 3
 8. Motor Speed: 3500 RPM
 9. Electrical Characteristics:
 - a. Volts: 208.
 - b. Phases: Three.
 - c. Hertz: 60.
 10. Pump-Start, Pressure-Switch Setting: 240 psig.
 11. Pump-Stop, Pressure-Switch Setting: 250 psig.

2.2 MOTORS

- A. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 210513 "Common Motor Requirements for Fire Suppression Equipment."
1. Motor Sizes: Minimum size as indicated; if not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. NFPA Standard: Comply with NFPA 20 for installation of pressure-maintenance pumps.
- B. Equipment Mounting:
 - 1. Install multistage, pressure-maintenance pumps according to HI 1.4.
 - 2. Install base-mounted pumps on cast-in-place concrete equipment base(s).
 - a. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - b. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - d. Attach pumps to equipment base using anchor bolts.
 - e. Shim pumps as needed to make them level.
 - 3. Install isolation valves in both inlet and outlet pipes near the pump. Comply with requirements for valves specified in Section 211313 "Wet-Pipe Sprinkler Systems."

3.2 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Pressure-maintenance pumps will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.3 ADJUSTING

- A. Lubricate pumps as recommended by manufacturer.
- B. Set field-adjustable pressure-switch ranges as indicated.

END OF SECTION 213413

SECTION 283111 - ADDRESSABLE FIRE-ALARM SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This specification applies to **high-rise** buildings as identified in the accompanying contract documents. Contractor is required to provide all services required to design, permit, install, and deliver a fully functional, voice evacuation, fully addressable fire alarm system meeting the requirements of this specification and accompanying contract documents.
 - 1. Initiating Devices
 - a. Fire alarm system initiating devices shall be provided throughout all portions of the building outside of individual Dwelling Units.
 - b. Fire alarm system carbon monoxide (CO) detectors shall be provided in select locations outside Dwelling Units as identified in the Contract drawings. CO detectors shall be connected to and supervised by the fire alarm system.
 - c. Non-system smoke alarms shall be provided throughout all Dwelling Units. Dwelling Unit smoke detection shall not be tied into the fire alarm system.
 - 2. Notification Appliances
 - a. Fire alarm system notification appliances shall be provided throughout all portions of the building, including a minimum of one audible notification device and one visual notification within each Dwelling Unit.
 - b. Public mode audible coverage shall be provided throughout all spaces. Intelligible public mode audible coverage shall only be required in select Acoustically Distinguishable Spaces (ADS) as illustrated in drawings.
 - c. Accessible Dwelling Units shall have supplemental visual notification appliances for both building fire alarm system notifications and (local) smoke alarm notifications provided in each Dwelling Unit room. Supplemental visual notification devices shall be comprised of both building fire alarm system visual notification appliances and (local) smoke alarm visual notification appliances.
 - 3. Third-Party Oversight
 - a. In addition to meeting requirements of local permit and code officials, the Owner anticipates retaining the services of a third party engineering firm to provide submittal review, periodic construction inspections, witnessing of final system commissioning, and other construction support services on behalf of the Owner. See paragraph 3.7 for further information.
 - 4. Inspection, Testing, and Maintenance Training
 - a. The Owner self-performs all periodic inspection, testing, and maintenance activities using in-house maintenance staff. System training and overview of inspection, testing, and maintenance activities are required as part of Contractor close-out efforts. See paragraph 3.8 for further information.
 - 5. Non-Proprietary Systems Only

- a. System components shall be available from multiple sources for both procurement and servicing. Systems exclusively available for procurement and service from only the manufacturer are prohibited.

B. Section Includes:

1. Fire-alarm control unit.
2. System Manual fire-alarm boxes.
3. System smoke detectors.
4. System carbon monoxide detectors
5. System Heat detectors.
6. Nonsystem smoke detectors (i.e., single- and multi-station smoke alarms).
7. Heat detectors.
8. Notification appliances.
9. Magnetic door holders.
10. Remote annunciator.
11. Addressable interface device.
12. Digital alarm communicator transmitter.

1.3 APPLICABLE CODES AND STANDARDS

The following lists codes and standards that are specifically applicable to work performed under this contract.

Department of Housing and Urban Development

- A. Code of Federal Regulations, Title 24, Housing and Urban Development (HUD)
- B. Uniform Federal Accessibility Standards (UFAS)

International Code Council (ICC)

- C. International Building Code (IBC), 2015 Edition
- D. International Fire Code (IFC), 2015 Edition

Local Code Requirements

- E. San Antonio Codes and Ordinances, Chapter 10, Amendments to Building Related Codes (SACO)
- F. San Antonio Codes and Ordinances, Chapter 11, Amendments to the International Fire Code (SACF)

National Fire Alarm Association (NFPA)

- G. NFPA 13, Installation of Sprinkler Systems, 2013 Edition
- H. NFPA 70, National Electric Code, 2014 Edition
- I. NFPA 72, National Fire Alarm Code, 2013 Edition

- J. NFPA 720, Installation of Carbon Monoxide Detectors, 2014 Edition

1.4 DEFINITIONS

- A. Accessible Dwelling Unit: intended for occupants with disabilities such as severe hearing loss; see “Dwelling Unit” definition for further details.
- B. AHJ: Authority(s) Having Jurisdiction
- C. CO: carbon monoxide
- D. Contracting Officer: San Antonio Housing Authority’s Contracting Representative
- E. Dwelling Unit: one or more rooms arranged for the use of one or more individuals living together, as in a single housekeeping unit normally having cooking, living, sanitary, and sleeping facilities that include, but are not limited to, dormitory rooms, apartments, condominiums, sleeping rooms in nursing homes, and similar living units.
- F. EMT: Electrical Metallic Tubing.
- G. FACU: Fire Alarm Control Unit.
- H. NICET: National Institute for Certification in Engineering Technologies.
- I. PC: Personal computer.

1.5 ACTION SUBMITTALS

Action submittals require submission to and written approval by the Contracting Officer prior to any subsequent required permit submissions and approvals.

Contracting Officer review / approval: provide one (1) electronic PDF copy, electronically bookmarked. No hardcopies required.

Permit / Code Official review / approval: provide quantity and type as directed by Permit / Code Official.

- A. Product Data: For each type of product, including furnished options and accessories.
 - 1. Organize into a single submittal package, complete with table of contents.
 - 2. Annotate product data sheets to identify intended device options where optional device characteristics are available.
 - 3. Include construction details, material descriptions, dimensions, profiles, and finishes.
 - 4. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
 - 1. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. NICET-certified, fire-alarm technician; Level IV minimum.
 - b. Licensed or certified by authorities having jurisdiction.

2. Texas: Copy of the Texas Department of Insurance Fire Alarm Installation Certificate.
 3. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 4. Include plans, elevations, sections, details, and attachments to other work.
 5. Illustrate location of acoustically distinguishable spaces requiring intelligible voice audio.
 6. Include ceiling height and construction type [SACF §907.1.2].
 7. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
 8. Detail assembly and support requirements.
 9. Design minimum audibility level for occupant notification. Include ambient audible levels for each type of space and speaker audibility ratings used to meet NFPA 72 requirements. Note: the design intent is to provide the *minimum* required volume to achieve NFPA 72 audibility [SACF §907.1.2].
 10. Provide speaker circuit load calculations providing a total dB loss at the end of each speaker circuit [SACF §907.1.2].
 11. Include voltage drop calculations for notification-appliance circuits.
 12. Include battery-size calculations.
 13. Include input/output matrix.
 14. Include interface of safety control functions [SACF §907.1.2].
 15. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
 16. Include performance parameters and installation details for each detector.
 17. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
 18. Include voice/alarm signaling-service equipment rack or console layout, grounding schematic, amplifier power calculation, and single-line connection diagram.
- C. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional responsible for their preparation.
1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
 2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
 3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.6 INFORMATIONAL SUBMITTALS

Information submittals require submission to Contracting Officer for informational purposes only. No explicit approvals are required, unless otherwise noted.

Provide one (1) bound, hardcopy, complete with table of contents and one (1) electronic PDF copy, electronically bookmarked.

- A. Qualification Data:
 - 1. Installation Supervisor.
 - 2. Installer(s).
 - 3. Lead Design Professional.
- B. Field quality-control reports.

1.7 Sample Warranty: For special warranty.

1.8 CLOSEOUT SUBMITTALS

The following closeout submittals shall be submitted and approved by the Contracting Officer.

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - 1. Provide three (3) bound, hardcopies, complete with table of contents and two (2) electronic PDF copies, electronically bookmarked.
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Record copy of site-specific software.
 - g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
 - h. Manufacturer's required maintenance related to system warranty requirements.
 - i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.
- B. Software and Firmware Operational Documentation:
 - 1. Software operating and upgrade manuals.
 - 2. Program Software Backup: On compact disc, complete with data files.
 - 3. Device address list.

4. Printout of software application and graphic screens.

1.9 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 3. Smoke Detectors, Fire Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
 4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
 5. Keys and Tools: One extra set for access to locked or tamperproofed components.
 6. Audible and Visual Notification Appliances: One of each type installed.
 7. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

1.10 QUALITY ASSURANCE

The following outline the minimum certifications and experience requirements for individuals involved in the design and installation of the fire alarm system. Documentation for each individual shall be submitted under paragraph 1.6.

- A. Lead Design Professional Qualifications: Design of the fire alarm system shall be under the responsible charge of:
 1. certified NICET fire-alarm Level IV (minimum) technician; or
 2. licensed Professional Engineer with 10-yrs (minimum) documented experience designing fire alarm systems of similar complexity.
- B. Installer Qualifications: Personnel performing installation activities shall be certified by NICET as fire-alarm Level I (minimum) technicians.
- C. Installation Supervisor Qualifications: Installation shall be supervised by a certified NICET fire-alarm Level III (minimum) technician.

1.11 PROJECT CONDITIONS

- A. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
 1. Notify Contracting Officer no fewer than seven days in advance of proposed interruption of fire-alarm service.
 2. Do not proceed with interruption of fire-alarm service without Contracting Officer's written permission.

- B. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.12 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring. Dispose of demolished materials in accordance with applicable regulations.

1.13 WARRANTY

Owner acceptance of system and start of warranty period shall not begin until completion of commissioning efforts, completion of maintenance staff training efforts, and acceptance of all required closeout submittals.

- A. Special Warranty: Contractor agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 2 years.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Noncoded, UL-certified addressable system, with multiplexed signal transmission and voice/strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. 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 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-**alarm** signal initiation shall be by one or more of the following devices:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Smoke detectors.
 - 4. Carbon monoxide detectors.
 - 5. Automatic sprinkler system water flow.

6. Fire standpipe system.
- B. Fire-**alarm** signal shall initiate the following actions:
1. Continuously operate alarm notification appliances, including voice evacuation notices.
 2. Identify alarm and specific initiating device at fire-alarm control unit and remote annunciators.
 3. Transmit an alarm signal to the remote alarm receiving station.
 4. Release fire and smoke doors held open by magnetic door holders.
 5. Activate voice/alarm communication system.
 6. Recall elevators to primary or alternate recall floors.
 7. Activate elevator power shunt trip.
 8. Record events in the system memory.
 9. Indicate device in alarm on the graphic annunciator.
- C. San Antonio, TX: Fire-**alarm** signal initiation by a Carbon Monoxide detector shall (only) initiate the following actions:
1. Identify alarm and specific initiating device at fire-alarm control unit.
 2. Transmit an alarm signal to the remote alarm receiving station.
 3. Release fire and smoke doors held open by magnetic door holders.
 4. Record events in the system memory.
- D. **Supervisory** signal initiation shall be by one or more of the following devices and actions:
1. Valve supervisory switch.
 2. Elevator shunt-trip supervision.
 3. Fire pump running.
 4. Fire-pump loss of power.
 5. Fire-pump power phase reversal.
 6. User disabling of zones or individual devices.
 7. Loss of communication with any panel on the network.
- E. System Supervisory Signal Actions:
1. Initiate notification appliances.
 2. Identify specific device initiating the event at fire-alarm control unit and remote annunciators.
 3. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.
- F. System **trouble** signal initiation shall be by one or more of the following devices and actions:
1. Open circuits, shorts, and grounds in designated circuits.
 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
 3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, printer interface, or Ethernet module.
 4. Loss of primary power at fire-alarm control unit.
 5. Ground or a single break in internal circuits of fire-alarm control unit.
 6. Abnormal ac voltage at fire-alarm control unit.
 7. Break in standby battery circuitry.

8. Failure of battery charging.
9. Abnormal position of any switch at fire-alarm control unit or annunciator.
10. Voice signal amplifier failure.

2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: not applicable to this project site.

2.4 FIRE-ALARM CONTROL UNIT

- A. Required location:

1. Provide in first floor entrance lobby. Coordinate an approved location acceptable to both the building Owner and AHJ.

- B. Fire alarm systems shall be “non-proprietary” systems available from multiple sources for both procurement and servicing. Systems exclusively available for procurement and servicing from only the manufacturer are prohibited. Fully field-programmable by hand or laptop. Owner maintenance staff shall be furnished with the necessary tools and documentation to make system revisions; such revisions shall not be limited to authorized manufacturer representatives.

- C. General Requirements for Fire-Alarm Control Unit (FACU):

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder and printer.
 - c. Provide communication between the FACU and remote circuit interface panels, annunciators, and displays.
 - d. The FACU shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACU shall provide a minimum 500-event history log.
2. Addressable Initiation Device Circuits: The FACU shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACU shall be listed for releasing service.

- D. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, three line(s) of 80 characters, minimum.
 2. Keypad: Arranged to permit entry and execution of programming, display, and control commands and to indicate control commands to be entered into the system for control of smoke-detector sensitivity and other parameters.
- E. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
1. Pathway Class Designations: NFPA 72, Class B.
 2. Pathway Survivability: Level 1 – fully sprinklered building, metal raceway required throughout.
 3. Serial Interfaces:
 - a. One dedicated RS 485 port for central-station operation using point ID DACT.
 - b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
- F. Remote Annunciator Panel
1. Provide an annunciator that includes an LCD display. The display shall indicate the device in trouble/alarm or any supervisory device. Display the device name, address, and actual building location on the LCD.
- G. Local Operating Console (LOC)
1. Locate LOC as indicated on plans. Mount the console so that the top message button is no higher than 44 inches above the floor. LOC shall be provided with the same paging options as the FACU.
- H. Notification-Appliance Circuit:
1. See 2.4L for audible (voice) requirements.
 2. Dwelling Unit audible notification appliances: where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
 3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.
- I. Elevator Recall:
1. Elevator recall shall be initiated only by one of the following alarm-initiating devices:
 - a. Elevator lobby detectors except the lobby detector on the designated floor.
 - b. Smoke detector in elevator machine room.
 2. Elevator controller shall be programmed to move the cars to the alternate recall floor if lobby detectors located on the designated recall floors are activated.
- J. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and

sensitivity-adjustment schedule changes in system memory, and print out the final adjusted values on system printer.

- K. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to remote alarm station.
- L. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided.
 - 1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.
 - a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
 - 1) Zones shall be established in Shop Drawings. Zoning shall be by floor. Elevators shall be an additional distinct zone. Stairwells shall be an additional distinct zone.
 - b. Programmable tone and message sequence selection.
 - c. Standard digitally recorded messages for "Fire Evacuation," "Carbon Monoxide Evacuation," and "All Clear."
 - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
 - 2. Status Annunciator: Indicate the status of various voice/alarm speaker zones.
 - 3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.
- M. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.
 - 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- N. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 - 1. Batteries: Sealed lead calcium.
- O. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

2.5 SYSTEM MANUAL FIRE-ALARM BOXES

- A. Required locations: comply with NFPA 72.

1. Within 5-ft of each exit.
San Antonio, TX: If windows or glazing prevents the installation of a manual fire alarm box within 5-ft of the exit, install at the point nearest to the exit along the egress path; confirm location with local AHJ prior to installation.

- B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. Where surface mounted, provide manufacturer's surface back box.

1. Single-action mechanism, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch. If key, key shall match equipment cabinet(s).

2.6 SYSTEM SMOKE DETECTORS

- A. System smoke detectors shall be furnished at all required locations outside Dwelling Units. See paragraph 1.4E for Dwelling Units.

- B. Required locations: comply with NFPA 72.

1. Over head-end equipment.
2. Elevator lobbies.
3. Elevator machine rooms.
4. Elevator hoistways.
5. Public / Common areas, such as corridors, community rooms, laundry rooms, public bathrooms, office areas, etc.
6. Top of each stairwell.
7. Duct smoke detector on supply-side of each HVAC unit greater than 2,000 cfm in accordance with NFPA 90A.

Note: Individual offices, back of house mechanical, electrical, and janitor spaces also do not require detection.

- C. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be two-wire type.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
7. Remote Control: detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.

D. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).

E. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
3. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; NRTL listed for use with the supplied detector for smoke detection in HVAC system ducts.
4. Each sensor shall have multiple levels of detection sensitivity.
5. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
6. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.7 SYSTEM CARBON MONOXIDE DETECTORS

- A. System CO detectors shall be installed on the ceiling near fuel-fired equipment and appliances.
- B. Required Locations: comply with IBC Section 915 and NFPA 720 and other applicable documents listed in paragraph 1.3.
 1. One CO detector in the immediate vicinity of each fuel-fired equipment or appliance.
- C. General: Carbon monoxide detector listed for connection to fire-alarm system.
 1. Mounting: Adapter plate for outlet box mounting.
 2. Testable by introducing test carbon monoxide into the sensing cell.
 3. Detector shall provide alarm contacts and trouble contacts or otherwise be capable of reporting alarm and trouble conditions to the fire alarm control unit.
 4. Detector shall send trouble status when nearing end-of-life, power supply problems, or internal faults.

5. Comply with UL 2075.
6. Locate, mount, and wire according to manufacturer's written instructions.
7. Provide means for addressable connection to fire-alarm system.
8. Test button simulates an alarm condition.

2.8 SYSTEM HEAT DETECTORS

- A. Required locations:
 1. Provide within 2-ft of sprinklers located in the elevator hoistway and the elevator machine room.
 2. Provide as an alternate device to replace system smoke detectors where ambient conditions are outside the manufacturer specified operational range.
- B. General Requirements for Heat Detectors: Comply with UL 521.
 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
 2. Heat detectors should have a lower response time index than the sprinklers they serve.
- C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature.
 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.
 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.9 NONSYSTEM SMOKE DETECTORS (i.e., single- and multi-station smoke alarms)

- A. Single- and multi-station smoke alarms shall be installed throughout all Dwelling Units. Smoke alarms shall not be connected to the building fire alarm system.
- B. Single- and multi-station smoke alarms shall be photoelectric type. Ionization-type smoke detectors are prohibited.
- C. Required locations: comply with NFPA 72.
 1. One smoke alarm in each sleeping room (e.g., bedroom).
 2. One smoke alarm outside of each sleeping area in the immediate vicinity of the bedrooms.

Note: additional smoke alarms are required where a single smoke alarm does not provide adequate coverage to every bedroom door. Every bedroom door shall be within 21-ft of a smoke alarm (located outside of the bedroom). The 21-ft shall be measured in the same manner as a walking path, which may differ from a straight point-to-point measurement. Continuous ceiling bulkheads extending down greater than 10% of the overall ceiling height that would interrupt migration of smoke along the walking path shall be treated as walls.

- D. General Requirements:

1. Nonsystem smoke alarms shall meet the monitoring for integrity requirements in NFPA 72.

E. Smoke Alarms:

1. Comply with UL 217; suitable for NFPA 101, residential occupancies; operating at 120-V ac with a battery as the secondary power source. Provide with "low" or "missing" battery chirping-sound device.
2. Audible Notification Appliance: Piezoelectric sounder meeting the requirements of NFPA 72. Audible alarm signal shall be ANSI S3.41, American National Standard Emergency Evacuation Signal (e.g., "temporal 3").
Note: NFPA 72 does not require nonsystem smoke alarms to produce low frequency square wave form audible alarm signals.
3. Visible Notification Appliance: 177-cd strobe. Dwelling Unit visual notification appliances are only required in Accessible Dwelling Units (as identified in the accompanying contract documents). Visual notification may be achieved via strobe integral to smoke alarm or via separate interconnected standalone strobe device.
4. Signals from smoke alarm notification appliances shall not be required to be synchronized.
5. Test Switch: Push to test; simulates smoke at rated obscuration.
6. Multi-Station Alarms: all single-station alarms within a single Dwelling Unit shall be interconnected for simultaneous notification. Alarm on one detector shall actuate notification on all connected alarms.
7. Plug-in Arrangement: Smoke alarm and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
8. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.

2.10 NOTIFICATION APPLIANCES

A. Required locations: comply with NFPA 72 Public Mode notification requirements.

1. Throughout all portions of the building.
2. Dwelling Units:
 - a. A single speaker shall be provided in each Dwelling Unit to broadcast audible notification messages. Location and intensity setting shall achieve NFPA 72 Public Mode notification requirements for audible voice messages throughout all portions of the Dwelling Unit. Intelligibility requirements do not apply within Dwelling Units.
 - b. A visual strobe device shall be provided in each Dwelling Unit living room [SACF §907.5.2.3.4].
3. Accessible Dwelling Units:
 - a. In addition to the single speaker required for all Dwelling Units, supplemental visual notification appliances shall be provided throughout all Accessible Dwelling Units to achieve NFPA 72 Public Mode visual notification requirements in every room. Small pantries, closets, and similar spaces are not required to have means for visual notification. Intelligibility requirements do not apply within Accessible Dwelling Units.

Note: Accessible Dwelling Units are anticipated to have two visual notification appliance systems throughout each room. One for the building fire alarm system and one for single- and multi-station smoke alarms, which are not connected to the building fire alarm system.

- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- C. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet (3 m) from the horn, using the coded signal prescribed in UL 464 test protocol. Applicable only for the single, outdoor appliance located over the FDC per local fire department preference. All other audible notification devices shall be speakers.
- D. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.
 - 1. Rated Light Output:
 - a. 15/30/75/110/177 cd, selectable in the field.
 - 2. Mounting: Wall or Ceiling mounted are acceptable.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, red.
- E. Voice/Tone Notification Appliances:
 - 1. Comply with UL 1480.
 - 2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" chapters in NFPA 72.
 - a. Intelligibility shall be required only in select spaces outside of Dwelling Units as identified on the drawings.
 - b. Audibility (i.e., minimum dB requirement) shall apply to all portions of the building, including areas where intelligibility is not required.
 - 3. Low-Range Units: Rated 1 to 2 W.
 - 4. Mounting:
 - a. Finished Spaces Outside Dwelling Units: flush, ceiling-mount.
 - b. Unfinished Spaces Outside Dwelling Units: surface, ceiling- or wall-mount.
 - c. Inside Dwelling Units: flush, wall-mount.
 - 5. Matching Transformers: Tap range matched to acoustical environment of speaker location.

2.11 MAGNETIC DOOR HOLDERS

- A. Description: Units are equipped for wall or floor mounting as indicated and are complete with matching doorplate.
 - 1. Electromagnets: Require no more than 3 W to develop 25-lbf (111-N) holding force.
 - 2. Wall-Mounted Units: Flush mounted unless otherwise indicated.
 - 3. Rating: 24-V dc or 120-V ac.
- B. Material and Finish: Match door hardware.

2.12 ADDRESSABLE INTERFACE DEVICE

- A. General:
 - 1. Include address-setting means on the module.
 - 2. Store an internal identifying code for control panel use to identify the module type.
 - 3. Listed for controlling HVAC fan motor controllers.
- B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.
- C. Integral Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall, to circuit-breaker shunt trip for power shutdown, and to HVAC equipment for shutdown.
 - 1. Allow the control panel to switch the relay contacts on command.
 - 2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

2.13 DIGITAL ALARM COMMUNICATOR TRANSMITTER

- A. Contractor shall furnish Digital alarm communicator transmitter (DACT). Communication lines are existing. Remote central station monitoring is provided by Others.
- B. DACT shall comply with UL 632.
- C. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture communication line(s) and connect to remote central station. When contact is made with central station(s), signals shall be transmitted.

Where two communication lines are present, if service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of communication line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report communication service restoration to the central station. If service is lost on both communication lines, transmitter shall initiate the local trouble signal.

- D. Local functions and display at the digital alarm communicator transmitter shall include the following:
 - 1. Verification that both telephone lines are available.

2. Programming device.
 3. LED display.
 4. Manual test report function and manual transmission clear indication.
 5. Communications failure with the central station or fire-alarm control unit.
- E. Digital data transmission shall include the following:
1. Address of the alarm-initiating device.
 2. Address of the supervisory signal.
 3. Address of the trouble-initiating device.
 4. Loss of ac supply.
 5. Loss of power.
 6. Low battery.
 7. Abnormal test signal.
 8. Communication bus failure.
- F. Secondary Power: Integral rechargeable battery and automatic charger.
- G. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

PART 3 - EXECUTION

3.1 CODE COMPLIANCE

- A. Contractor shall perform all required design, permitting, installation, and commissioning efforts in accordance with the applicable codes and standards listed in paragraph 1.3.
- B. Criteria Conflict Resolution: Contractor shall bring conflicting requirements, including conflicts between contract documents and applicable codes and standards, to the attention of the Contracting Officer for direction and resolution via written Request for Information (RFI). RFI's shall include at a minimum:
1. Referenced code(s), including specific paragraph number(s).
 2. Description of conflict.
 3. Contractor-suggested resolution.
 4. Potential cost and schedule impact(s).

3.2 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Install wall-mounted equipment, with tops of cabinets not more than **78 inches (1980 mm)** above the finished floor.
- C. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within **60 inches (1520 mm)** of the exit doorway.
 2. San Antonio, TX: If windows or glazing prevents the installation of a manual fire alarm box within 5-ft of the exit, install at the point nearest to the exit along the egress path; confirm location with local AHJ prior to installation.
 3. Mount manual fire-alarm box on a background of a contrasting color.
 4. The operable part of manual fire-alarm box shall be between **42 inches (1060 mm)** and **48 inches (1220 mm)** above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- D. Smoke- or Heat-Detector Spacing:
1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
 2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
 3. Smooth ceiling spacing shall not exceed **30 feet (9 m)**.
 4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex B in NFPA 72.
 5. HVAC: Locate detectors not closer than **36 inches (910 mm)** from air-supply diffuser.
 6. Lighting Fixtures: Locate detectors not closer than **12 inches (300 mm)** from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- E. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- F. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than **36 inches (9100 mm)** long shall be supported at both ends.
1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.
- G. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location.

- H. Nonsystem Smoke Detectors (i.e., single- and multi-station smoke alarms): Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound. Photoelectric smoke alarms shall be installed a minimum 6-ft horizontally from permanently installed cooking appliances. Smoke alarms shall be installed a minimum 3-ft horizontally from the door or opening of a bathroom that contains a bathtub or shower.
- I. Remote Status and Alarm Indicators: Install in a visible location near each system smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.
- J. Paint exposed raceway to match adjacent wall or ceiling. Provide sample matching paint colors to owner or owner's representative prior to purchase and application of paint.

3.4 PATHWAYS

- A. All wiring shall be installed in metallic raceway. Raceway shall be continuous and allow for re-pulling of circuits.
- B. The following pathways shall be installed in EMT:
 - 1. Pathways within building construction, such as within walls and above gypsum board ceilings.
 - 2. Exposed pathways in unfinished spaces less than 96 inches (2440 mm) above the floor.
 - 3. Exposed pathways in finished spaces, including those above 96 inches (2440 mm).
 - 4. Pathways for power and other AC-circuits.
- C. Flexible metallic conduit (e.g., Greenfield), which does not support re-pulling of circuits, is acceptable only where access is readily available (e.g., exposed unfinished locations and above acoustical ceiling tile).
- D. Exposed pathways shall be painted to match adjacent interior finish color(s).

3.5 CONNECTIONS

- A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Magnetically held-open doors.
 - 2. Alarm-initiating connection to elevator recall system and components.
 - 3. Supervisory connections at valve supervisory switches.
 - 4. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
 - 5. Supervisory connections at elevator shunt-trip breaker.
 - 6. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.
 - 7. Supervisory connections at fire-pump engine control panel.

3.6 IDENTIFICATION

- A. Install framed instructions in a location visible from fire-alarm control unit.

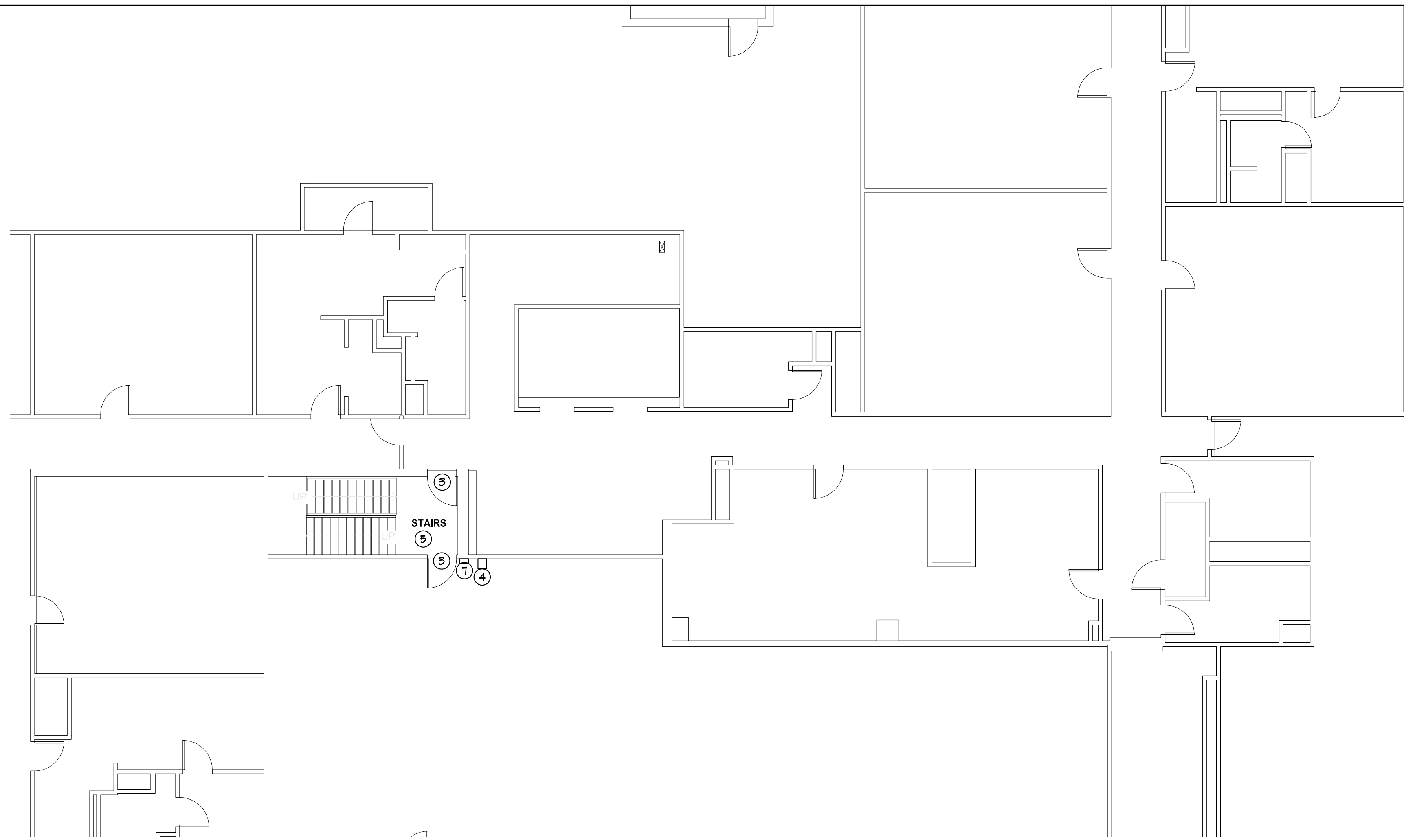
3.7 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Contracting Officer and authorities having jurisdiction.
- B. Perform tests and inspections.
- C. Perform the following tests and inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Audibility Testing: Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 - 4. Intelligibility Testing: Test audible appliances in Acoustically Distinguishable Spaces (ADS's) indicated on drawings as requiring intelligibility. A minimum acceptable common intelligibility scale (CIS) score of 0.7 shall be achieved; see NFPA 72 §A.7.4.1.4 for further details.
 - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 - 6. Prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- D. Reacceptance Testing: Perform reacceptance testing, when applicable, to verify the proper operation of added or replaced devices and appliances.
- E. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- F. Prepare and furnish copies of test and inspection reports.
- G. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 DEMONSTRATION

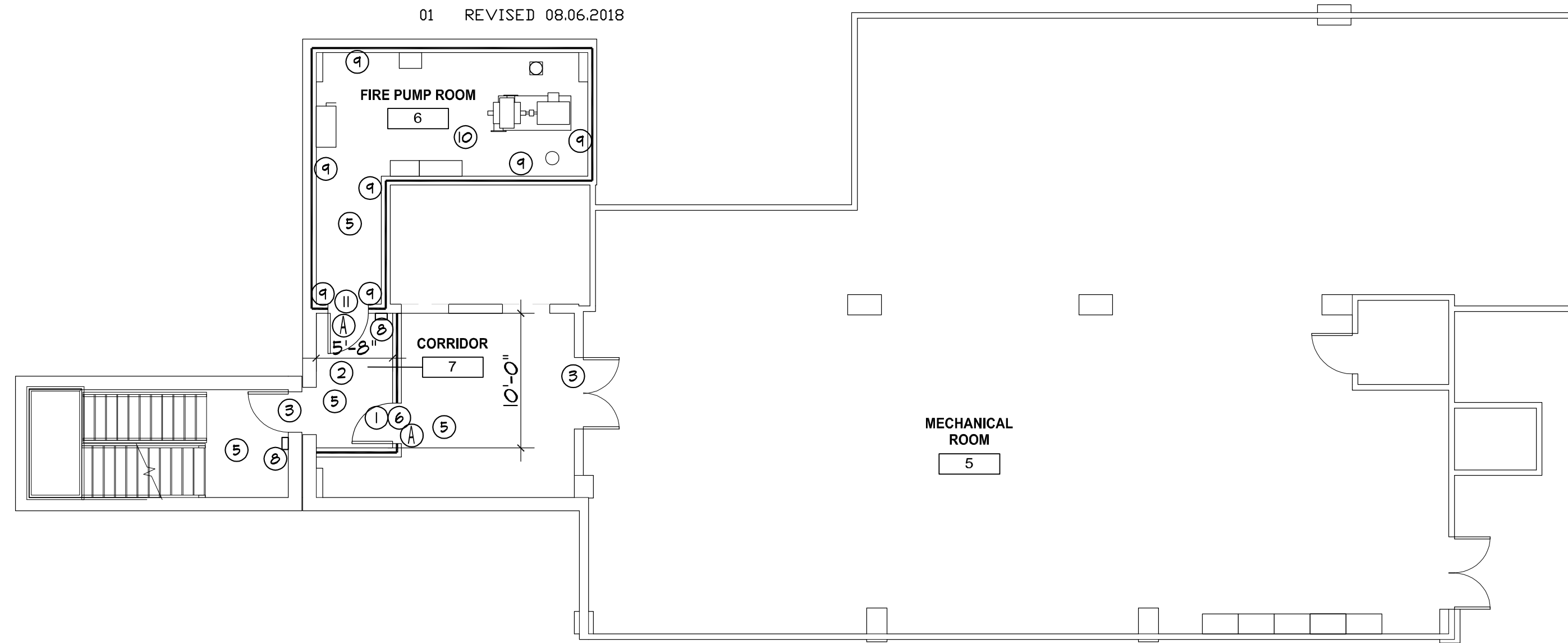
- A. Owner's in-house maintenance staff are responsible for supporting periodic inspection, testing, and maintenance of these systems. Contractor shall provide thorough and complete training of all aspects of the systems, including:
 - 1. System use and operation.
 - 2. Periodic inspection, testing, and maintenance requirements and procedures.
 - 3. System adjustments.
 - 4. Common trouble-shooting procedures.
 - 5. System and program modifications.
- B. Training shall be conducted in a professional manner and comprised of a mixture of written reference material, presentation, and hands-on activities with actual installed equipment or similar demonstration equipment.
- C. Contractor shall furnish all training personnel, equipment, and materials necessary for training.
- D. A minimum of 10-sets of written materials shall be furnished and retained by the Owner. A duplicate electronic PDF set shall also be furnished to support future Owner reproduction needs.
- E. Training shall be planned for a single 8-hr session.
- F. A single piece of each type of equipment and software required to perform system adjustments, maintenance, and program revisions shall be furnished to and retained by the Owner following training as part of this Contract. This shall include service equipment such as device programmers and a laptop where such devices are required for system or program modifications.

END OF SECTION 284621.11

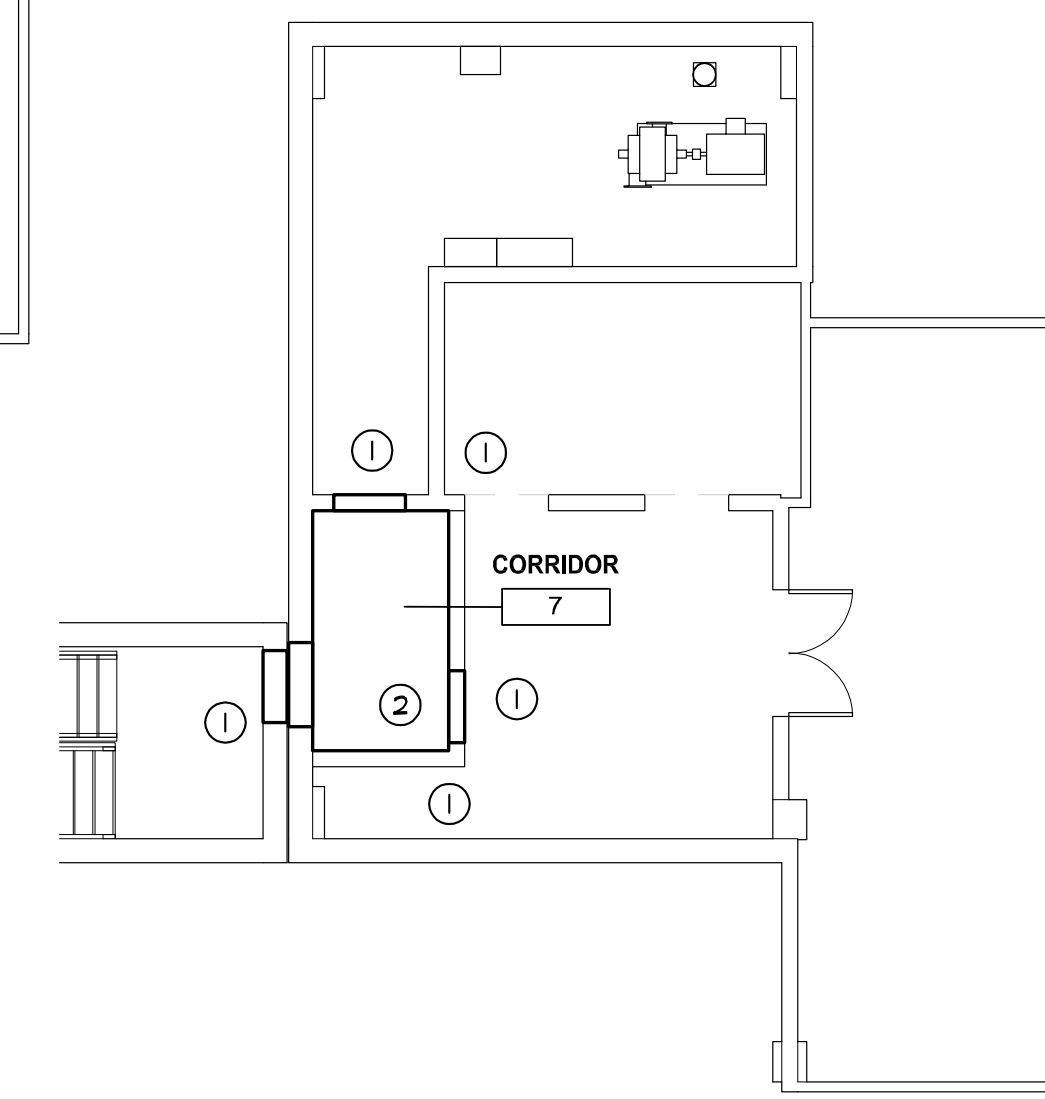


1 ARCHITECTURAL GROUND FLOOR PLAN
1/8" = 1'-0"

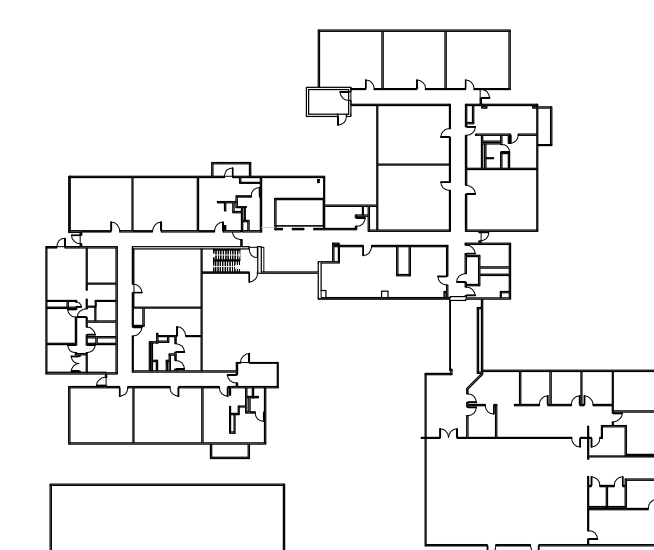
01 REVISED 08.06.2018



2 ARCHITECTURAL BASEMENT FLOOR PLAN
1/8" = 1'-0"



4 BASEMENT RCP
1/8" = 1'-0"



OVERALL BUILDING PLAN

FLOOR PLAN LEGEND

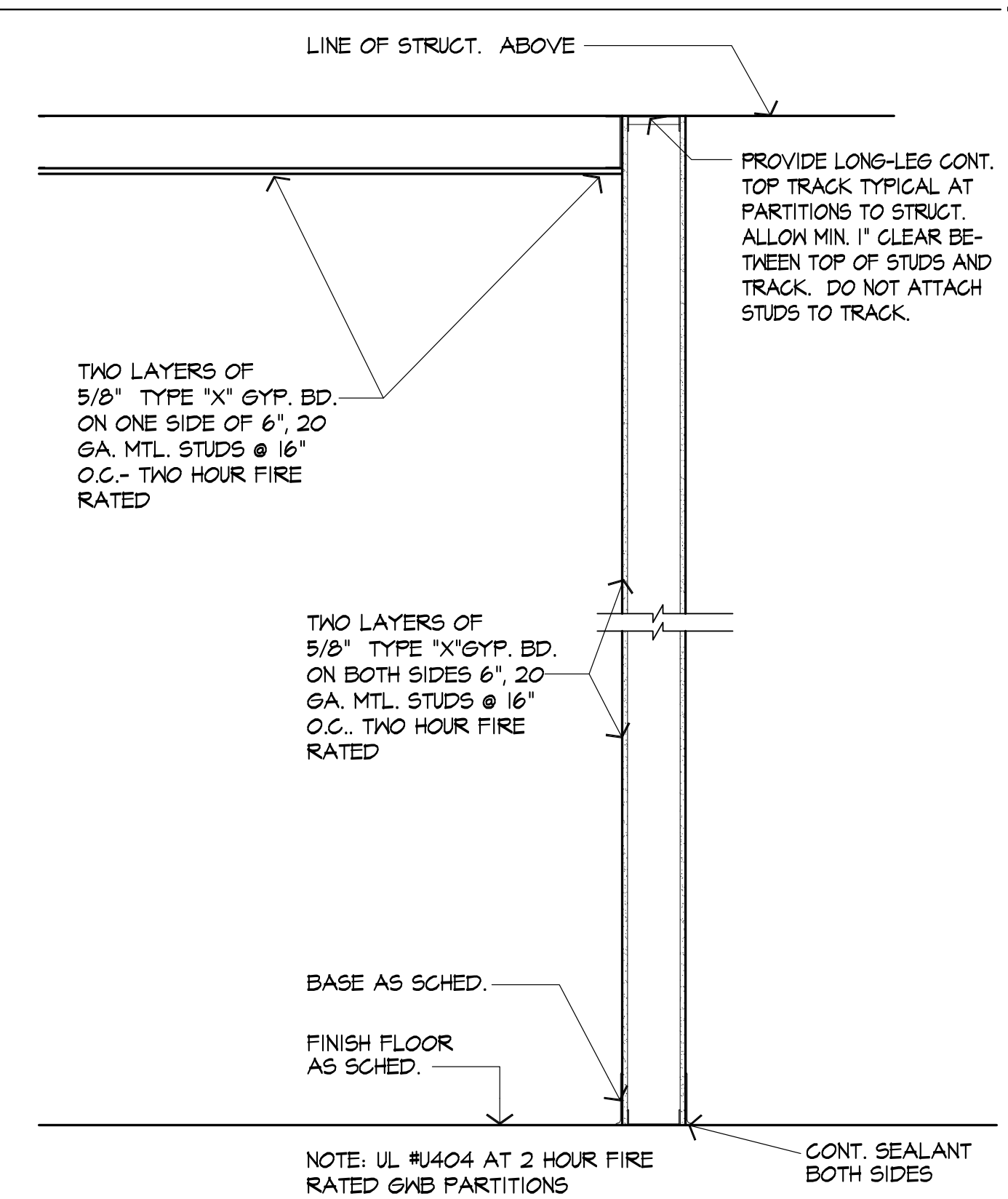
- EXISTING WALL CONSTRUCTION TO REMAIN
- 2 HOUR FIRE RATED WALL TO UNDERSIDE OF STRUCTURE. REFER TO DETAIL 03/ THIS SHEET

FLOOR PLAN KEY NOTES

- 1 36"x84" HM DOOR AND HOLLOW METAL FRAME. PAINT FINISH COLOR TO MATCH EXISTING DOORS IN BASEMENT. DOOR AND FRAME ARE 1 HOUR FIRE RATED
- 2 LATEX WALL PAINT FINISH AT ALL INTERIOR CORRIDOR 7 WALLS AS WELL AS BOTH SIDES OF NEW CONSTRUCTION
- 3 EXISTING DOOR, DOOR FRAME AND HARDWARE TO REMAIN
- 4 EXISTING KNOX BOX TO REMAIN
- 5 EXISTING FLOOR FINISH TO REMAIN
- 6 DOOR HARDWARE: LEVER LOCKSET, PANIC DEVICE, CLOSER, SMOKE SEAL, 3-HINGES, DOOR BOTTOM, ACCESSIBLE. MANUFACTURE AND FINISH COLOR TO MATCH EXISTING DOOR HARDWARE IN BASEMENT. DOOR TO BE KEYED TO EXISTING BUILDING MASTER KEY SYSTEM.
- 7 WALL MOUNTED DOOR SIGNAGE TO READ "FIRE PUMP ROOM IN BASEMENT". SIGN TYPE I- SEE DETAIL 03/ A.102
- 8 WALL MOUNTED DOOR SIGNAGE TO READ "FIRE PUMP ROOM". SIGN TYPE I- SEE DETAIL 03/ A.102
- 9 EXISTING 8" CMU WALL CONSTRUCTION AT FIRE PUMP ROOM. 2 HOUR FIRE RATED PER 2015 IBC TABLE 721.1 (2). FIRE CAULK ALL PENETRATIONS WITH FIRE SAFING INSULATION.
- 10 EXISTING 4" STANDARD CONCRETE FLOOR CEILING CONSTRUCTION AT FIRE PUMP ROOM. 2 HOUR FIRE RATED PER 2015 IBC TABLE 721.1 (3). FIRE CAULK ALL PENETRATIONS WITH FIRE SAFING INSULATION.
- 11 NEW 2 HOUR FIRE RATED HOLLOW METAL DOOR AND FRAME.

RCP KEY NOTES

- 1 EXISTING CEILING FINISH TO REMAIN
- 2 PAINT FINISH AT GMB CEILING



wall section general notes

1. THE NOMINAL DIMENSIONS OF PARTITIONS IS USED ON FLOOR PLANS.
2. CONSTRUCTION OF FIRE-RATED PARTITIONS, INCLUDING TAPING AND FINISHING OF GYPSUM BOARD FOR FULL HEIGHT TO STRUCTURE ABOVE, SHALL BE IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS TO ACHIEVE RATING INDICATED ON DRAWINGS.

3 WALL SECTION
3/4" = 1'-0"

Date	Description	No.
05/24/18	ISSUE FOR PERMIT	
08/17/18	ISSUE FOR BID	

FAIR AVENUE APARTMENTS SPRINKLER DESIGN
SAN ANTONIO HOUSING AUTHORITY
1215 FAIR AVENUE
SAN ANTONIO, TEXAS

KCI
ENGINEERS
PLANNERS
SCIENTISTS
CONSTRUCTION MANAGERS
13780 SAN PEDRO AVE. STE. 440
SAN ANTONIO, TX 78223
Ph: (210) 444-5751
Texas Registered Engineering Firm F-10573

REGISTERED ARCHITECT
ALVIN G. PETERS
15199
STATE OF TEXAS
08-15-18

PROJECT NUMBER
7817053.00
DRAWN BY
A. PETERS
CHECKED BY
A. PETERS
SHEET DATE
12.10.2017

ARCHITECTURAL
NEW WORK PLAN

POWER GENERAL NOTES

- A. REMOVE ALL ABANDONED CABLING, WIRE AND CONDUIT. TERMINATE CONDUITS OUTSIDE ELECTRICAL ROOM WITH A JUNCTION BOX. TURN BREAKER OFF AND UPDATE PANEL DIRECTORY TO INDICATE SPARE BREAKER AND DATE OF CHANGE.
- B. COORDINATE LOCATIONS OF ALL DEVICES AND JUNCTION BOXES WITH THE EQUIPMENT INSTALLER.
- C. CONTRACTOR SHALL NOT INSTALL MORE THAN THREE CIRCUITS (3 PHASE WIRES, 1 NEUTRAL + 1 GROUND) IN A COMMON CONDUIT, EXCEPT WHERE SPECIFICALLY NOTED AND ALLOWED. WHERE MORE THAN THREE CURRENT CARRYING CONDUCTORS (EXAMPLES: 3 PHASE WIRES + 1 CURRENT CARRYING NEUTRAL CONDUCTOR) ARE INSTALLED IN A COMMON CONDUIT, THE AMPACITY OF ALL CURRENT-CARRYING CONDUCTORS SHALL BE DERATED PER NEC ARTICLE 310.15 (B)(3)(A). EXAMPLE: 20AMP CKTS WITH 8 CURRENT CARRYING WIRES IN A COMMON CONDUIT MUST USE MINIMUM #10 WIRE 70% X 35A = 24.5 AMPS. PROVIDE COMMON TRIP BREAKERS FOR MULTIWIRED CIRCUITS PER NEC ARTICLE 210.4 (B).

LIGHTING GENERAL NOTES

- A. VERIFY COLOR OF ALL FIXTURES WITH OWNER.
- B. DRAWINGS DO NOT SHOW DETAILS OF FIXTURE MOUNTING. ELECTRICAL CONTRACTOR TO PROVIDE ALL NECESSARY AND REQUIRED MOUNTING HARDWARE AND ACCESSORIES AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. SLOPED CEILING: PROVIDE SLOPED-CEILING ADAPTORS AS REQUIRED FOR ALL FIXTURES INSTALLED IN SUCH CEILING.
- C. ALL FIXTURES SUPPORTED BY FRAMING MEMBER BY MECHANICAL MEANS, SUCH AS BOLTS, SCREWS, OR RIVETS. CLIPS IDENTIFIED FOR USE WITH THE TYPE OF CEILING FRAMING MEMBER(S) AND FIXTURE(S) SHALL BE PERMITTED. ALL FOUR SIDES OF FIXTURES SHALL BE FASTENED TO STRUCTURAL MEMBERS. REFERENCE N.E.C. ARTICLE 410-36(B).
- D. ACCEPTABLE LAMP MANUFACTURERS: MATCH BASE BUILDING STANDARDS. ACCEPTABLE BALLAST MANUFACTURERS: MATCH BASE BUILDING STANDARDS.
- E. ALL LAMPS ARE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE (THIS APPLIES TO ALL NEW FIXTURES). REPLACE ALL BURNT OUT OR DEFECTIVE LAMPS AND BALLAST WITHIN 6 MONTHS AFTER ACCEPTANCE OF SUBSTANTIAL COMPLETION AT NO ADDITIONAL COST TO THE OWNER (THIS APPLIES TO NEW FIXTURES ONLY, NOT REUSED/EXISTING FIXTURES).
- F. ALL FIXTURES SHALL BE FACTORY PAINTED-AFTER-FABRICATION TYPE.

MECHANICAL/ELECTRICAL SHEET LIST

ME.001	MECHANICAL & ELECTRICAL COVER SHEET
ME.100	ME PLAN - BASEMENT
ME.101	ME PLAN - LEVEL 1
ME.102	ME PLAN - LEVEL 2
ME.103	ME PLAN - LEVEL 3
ME.104	ME PLAN - LEVEL 4
ME.105	ME PLAN - LEVEL 5
ME.106	ME PLAN - LEVEL 6
ME.107	ME PLAN - LEVEL 7
ME.108	ME PLAN - LEVEL 8
ME.109	ME PLAN - LEVEL 9
ME.110	ME PLAN - LEVEL 10
ME.111	ME PLAN - LEVEL 11
ME.201	ELECTRICAL RISER AND LOAD ANALYSIS
ME.202	ELECTRICAL PANEL SCHEDULES
ME.203	ELECTRICAL PANEL SCHEDULES
ME.301	ELECTRICAL SPECIFICATIONS
ME.400	FENCE AND GATE DETAILS
ME.401	GENERATOR PAD DETAILS

HAZARDOUS MATERIALS NOTICE

VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

ELECTRICAL DEMOLITION GENERAL NOTES

- A. PLANS DO NOT ATTEMPT TO SHOW ALL DEMOLITION ITEMS. ELECTRICAL CONTRACTOR (E.C.) TO FIELD VERIFY ALL DEMOLITION ITEMS AND PROVIDE REMOVAL OF ALL DEVICES ACCORDINGLY. E.C. SHALL REMOVE ALL EXISTING LIGHTING FIXTURES, ASSOCIATED SWITCHES/DIMMERS, AND EXIT LIGHTS IN BASEMENT. REMOVE CONDUIT/WIRE BACK TO PANEL(S) UNLESS RE-USED FOR NEW WORKS. EXISTING CONDUIT/WIRE WITH ADEQUATE CAPACITY FOR NEW LOADS MAY BE RE-USED. IF ANY REMOVED BALLASTS ARE SUSPECTED TO CONTAIN PCB'S, DO NOT DISPOSE OF. SET SUCH ASIDE AND NOTIFY OWNER FOR AUTHORIZED REMOVAL. REMOVE SUCH BALLASTS IN STRICT COMPLIANCE WITH FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES. BALLASTS DATED PRIOR TO 1976 OR NOT SPECIFICALLY MARKED "NO PCB'S" SHALL BE CONSIDERED TO CONTAIN PCB'S. FIXTURES SHALL BE DELIVERED TO A LOCATION TO BE SPECIFIED BY OWNER. ALL FIXTURES UPSTREAM OR DOWNSTREAM OF DEMO'D FIXTURES AND ON THE SAME CKTS SHALL BE RECONNECTED TO MAINTAIN SERVICE. PROVIDE NEW CONDUIT/WIRE AS REQ'D.
- B. DAMAGE TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED AT NO ADDITIONAL COST TO OWNER. RE-SUPPORT ANY REMAINING CONDUIT OR DEVICE THAT WERE SUPPORTED BY WALLS/MILLWORK BEING REMOVED.
- C. NON-DEMOLITION AREAS: DEMOLITION WORKS SHALL NOT AFFECT AREAS NOT INCLUDED IN DEMOLITION. E.C. SHALL BE RESPONSIBLE FOR THE CONTINUITY OF ALL SERVICES (POWER, TELEPHONE, FIRE ALARM, DATA) IN NON-DEMOLITION AREAS. ALL SERVICES SHALL BE MAINTAINED AT ALL TIMES. ELECTRICAL CONTRACTOR (E.C.) SHALL MAINTAIN SERVICE BY EXTENDING, REROUTING AND/OR RE-CONNECTING ANY CIRCUITS AFFECTED BY DEMOLITION. PROVIDE ADDITIONAL CONDUIT/WIRE AS REQUIRED TO MAINTAIN SERVICE. CIRCUITS IN NON-DEMOLITION AREAS THAT ARE CONNECTED TO DEMO'D PANELS AND/OR CIRCUITS SHALL BE RE-CIRCUITED TO A NEW SUB-PANEL (FURNISHED AND INSTALLED BY E.C., SIZE AS REQUIRED) IF SPACES/SPARES ARE NOT AVAILABLE IN ANY NEW PANELS IN RENOVATION AREAS. PROVIDE TEMPORARY POWER AS REQUIRED DURING CHANGE-OVER TO MAINTAIN CONTINUOUS SERVICE. PROVIDE TEMPORARY POWER FOR ALL RELOCATED CIRCUITS AS REQUIRED TO MAINTAIN CONTINUOUS SERVICE. SIMILARLY FOR FIRE ALARM, SECURITY, DATA SYSTEM.
- E. ALL EXISTING ABANDONED AND/OR UN-USED CONDUIT/WIRE, SWITCHES/STARTERS, J-BOXES, COMMUNICATION SYSTEM AND DEVICES IN PROJECT AREAS SHALL BE REMOVED BACK TO PANELS AND/OR CONTROL PANELS. ALL ITEMS DEMO'D BY E.C. SHALL BE REMOVED/BACK TO PANELS AND/OR CONTROL PANELS.
 - EMERGENCY AND NORMAL POWER CIRCUITS IN THE SAME CONDUIT - PROVIDE SEPARATION OF EMERGENCY AND NORMAL CIRCUITS AND INSTALL IN SEPARATE CONDUIT.

SCOPE OF WORK FOR ELECTRICAL CONTRACTOR

- PROVIDE TEMPORARY EMERGENCY STAND-BY POWER GENERATOR
- DEMO AND REPLACE EXISTING EMERGENCY STAND-BY GENERATOR AND REPLACE WITH NEW GENERATOR SET AND FUEL TANK.
- DEMO AND REMOVE FEEDER AND DISCONNECT FOR EXISTING DOMESTIC WATER PUMP. PROVIDE NEW FEEDER AND BREAKER FROM EXISTING MDP.
- DEMO AND REMOVE FEEDER AND DISCONNECT FOR EXISTING SUMP PUMP. PROVIDE NEW FEEDER AND BREAKER FROM EXISTING MDP.
- DEMO AND REMOVE FEEDER AND DISCONNECT FOR EXISTING JOCKEY PUMP. PROVIDE NEW FEEDER AND BREAKER FROM EXISTING MDP.
- DEMO EXISTING FIRE PUMP FEEDER. PROVIDE NEW FEEDER FOR NEW FIRE PUMP WITH INTEGRAL ATS.
- REMOVE AND REPLACE LIGHTING IN BASEMENT WITH NEW LED LIGHTING.
- PROVIDE CIRCUITS FOR FIRE ALARM DEVICES INDICATED.

ELECTRICAL ABBREVIATIONS

(D)	Demo
(E)	Existing
(N)	New
AC	Alternating Current
AF	Ampere Fuse
AFF	Above Finished Floor
AHJ	Authority Having Jurisdiction
AIC	Ampere Interrupting Capacity
AMP	Ampere
AT	Ampere Trip
ATS	Automatic Transfer Switch
AWG	American Wire Gauge
C	Conduit
CB	Circuit Breaker
CKT	Circuit
CT	Current Transformer
CU	Copper
DISC.	Disconnect
EA	Each
E.C.	Electrical Contractor
FA	Fire Alarm
FAAP	Fire Alarm Annunciation Panel
FACP	Fire Alarm Control Panel
FLA	Full Load Amps
G.C.	General Contractor
GFI	Ground Fault Interrupter
GRD	Ground
GRS	Galvanized Rigid Steel
HP	Horsepower
JBOX	Junction Box
KVA	Kilo-Volt-Ampere
KW	Kilowatt
LTG	Lighting
MCB	Main Circuit Breaker
MLO	Main Lugs Only
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NF	Non-Fused
NTS	Not to Scale
OC	Overcurrent
OCF	Overcurrent Protection
PH	Phase
PNL	Panel
RCPT	Receptacle
REQ'D	Required
SN	Solid Neutral
SPECS	Specifications
SWBD	Switchboard
TVSS	Transient Voltage Surge Suppressor
TYP.	Typical
U.N.O.	Unless Noted Otherwise
V	Volt
VA	Volt-Ampere
W	Watt or Wire
W/	With
W/O	Without
WP	Weatherproof
XFMR	Transformer

ELECTRICAL LEGEND

ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED IN THIS PROJECT

- E (E) EXISTING
- R (R) RELOCATED
- N (N) NEW
- NEW STRIP LIGHT FIXTURE. LETTER INDICATES TYPE.
- STRIP LIGHT FIXTURE CONNECTED TO EMERGENCY BATTERY BALLAST. CONNECT TO UN-SWITCHED POWER LEADS. PROVIDE BODINE #B50 (1100 LUMENS) UNLESS NOTED OTHERWISE ELSEWHERE. (NOTE: SIMILAR FOR ALL LIGHT FIXTURES)
- EXISTING STRIP LIGHT FIXTURE. LETTER INDICATES TYPE.
- NEW DOWNLIGHT FIXTURE. LETTER INDICATES TYPE.
- EXISTING DOWNLIGHT/WALL-WASHER FIXTURE. LETTER INDICATES TYPE.
- EXIT LIGHT. PROVIDE DIRECTIONAL CHEVRON(S) ARROW(S) AS INDICATED ON PLANS. CONNECT TO EMERGENCY CIRCUIT.
- EXISTING EXIT LIGHT.
- SINGLE POLE SWITCH
- THREE(3) WAY SWITCH
- DUPLEX RECEPTACLE, 20AMP, 125VOLT, 2POLE, 3WIRE, GROUNDING TYPE, NEMA 5-20R
- GROUND FAULT INTERRUPTOR (GFI) DUPLEX RECEPTACLE. SIMILAR TO DUPLEX RECEPTACLE ABOVE.
- WEATHERPROOF (WP) DUPLEX RECEPTACLE. SIMILAR TO DUPLEX RECEPTACLE ABOVE.
- JUNCTION BOX.
- ELECTRICAL PANEL BOARDS.
- DISCONNECT SWITCH. ALL SWITCHES SHALL BE HEAVY DUTY TYPE (E.G. 30A/3P/600/NF/NEMA 1)
- FUSED DISCONNECT SWITCH. SIMILAR TO ABOVE.
- COMBINATION DISCONNECT SWITCH AND MAGNETIC MOTOR STARTER. 30AMP SIZE 1 MINIMUM TYPICAL UNLESS NOTED OTHERWISE. PROVIDE CONTROL POWER TRANSFORMER, 2 N.O. AND 2 N.C. CONTACTS, HAND-OFF-AUTOMATIC SWITCH, RED PILOT LIGHTS ("RUN" LIGHT), PROVIDE OVERLOAD RELAYS MATCHING FLA OF EQUIPMENT.
- CONDUIT RUN CONCEALED IN WALL OR CEILING
- CONDUIT RUN CONCEALED IN FLOOR
- HOMERUN TO ELECTRICAL PANELBOARDS

LEGEND NOTES:
 1. THE WORD "PROVIDE" AS USED IN THESE DRAWINGS SHALL MEAN "MATERIALS AND LABOR FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR".
 2. MOUNTING HEIGHT OF ALL LIGHT SWITCHES, DIMMERS, RECEPTACLES, TELEPHONE, DATA AND SIGNAL OUTLETS SHALL BE IN ACCORDANCE WITH THE "AMERICAN WITH DISABILITIES ACT", LIGHT SWITCHES, DIMMERS, ETC. (+42") RECEPTACLES, TELEPHONE, DATA, ETC. (+18") ALL MOUNTING HEIGHTS ARE MEASURED FROM FINISHED FLOOR TO CENTER OF DEVICE. MOUNTING HEIGHTS SHOWN ON THE ARCHITECT DRAWINGS AND SPECIFICATIONS TAKE PRECEDENCE. VERIFY EXACT MOUNTING HEIGHT REQUIRED WITH ARCHITECT AND INSTALL ACCORDINGLY.

ELECTRIC UNIT HEATER SCHEDULE	
PROJECT: 1215 FAIR AVE	
TAG	EUH-1
AREA SERVED	STAIRWELL
AIR FLOW CFM	310
HEAT CAP. (KW)	3
HEAT CAP. (MBH)	10
VOLTS/PH/CYCLES	208/1/60
NOTES	1
REZNOR MODEL OR EQ.	EGEB
NOTES: 1. PROVIDE WITH WALL-MOUNTED THERMOSTAT.	

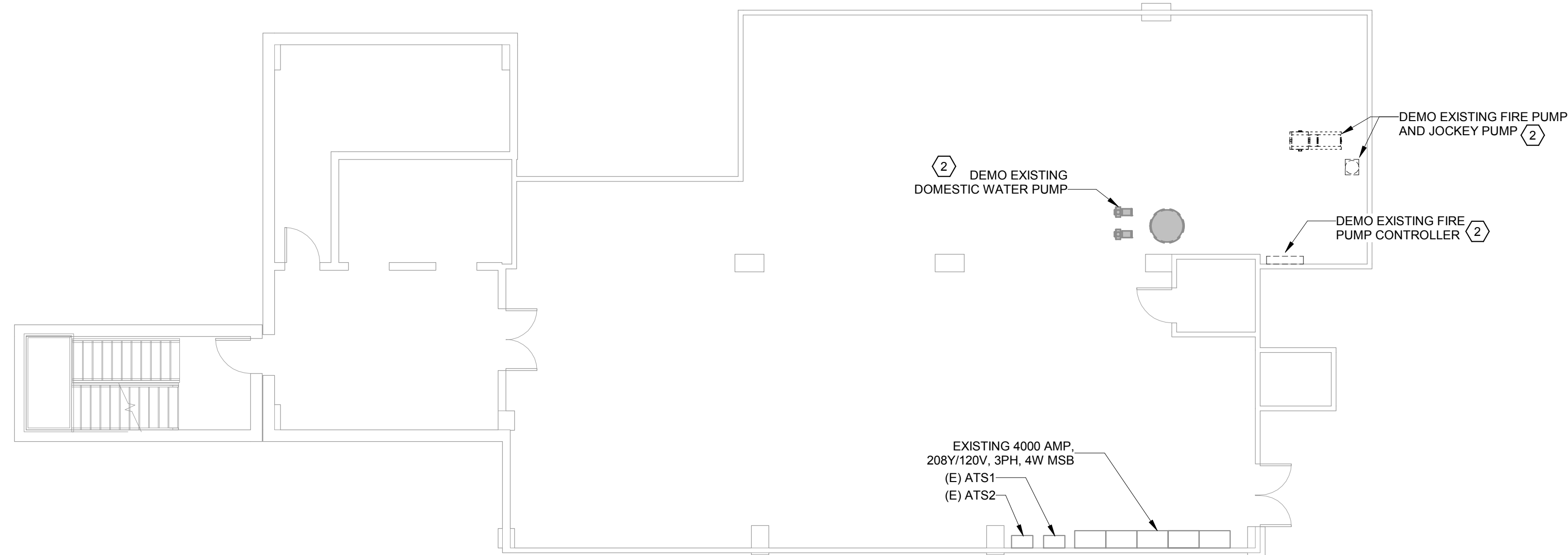
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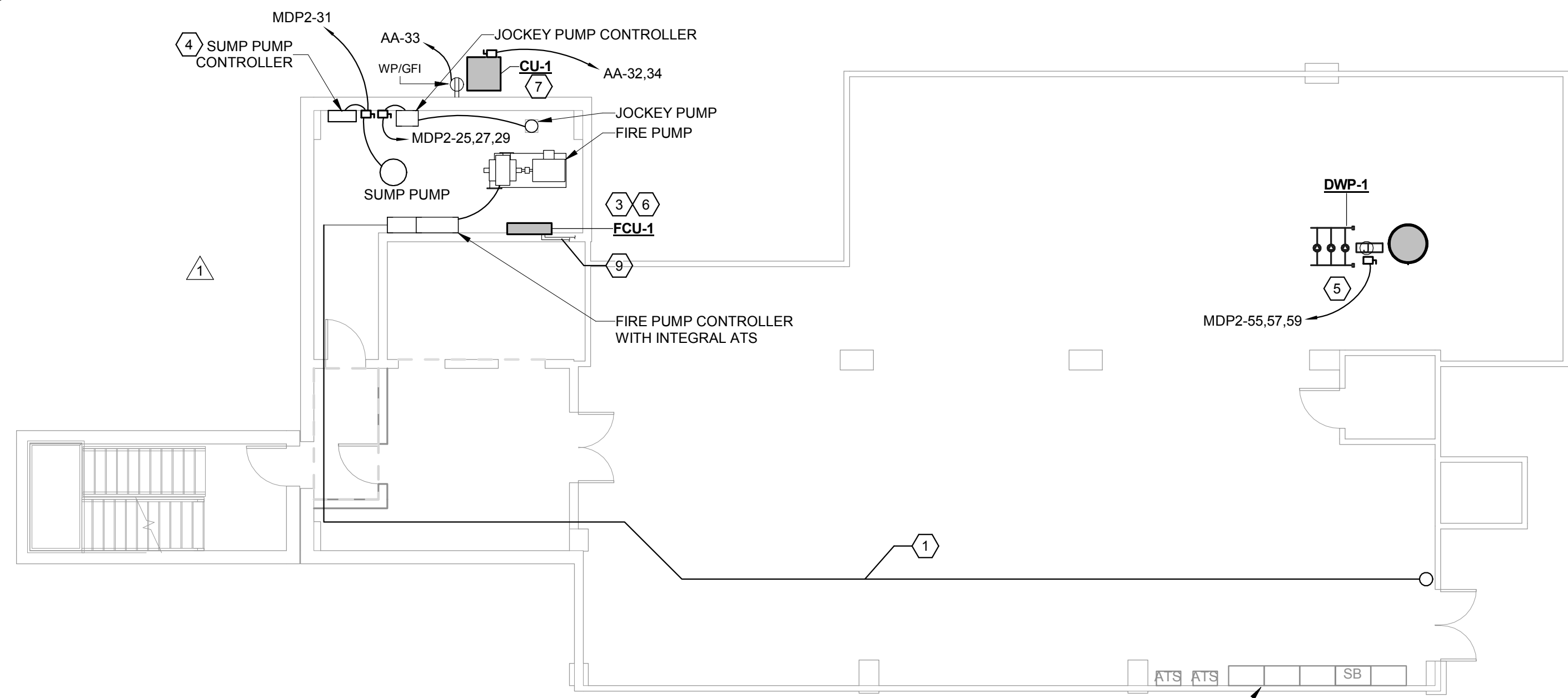
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PROJECT NUMBER	7917053.00
DRAWN BY	D. Lukert
CHECKED BY	C. Clements
SHEET DATE	08/17/18
MECHANICAL & ELECTRICAL COVER SHEET	
ME.001	

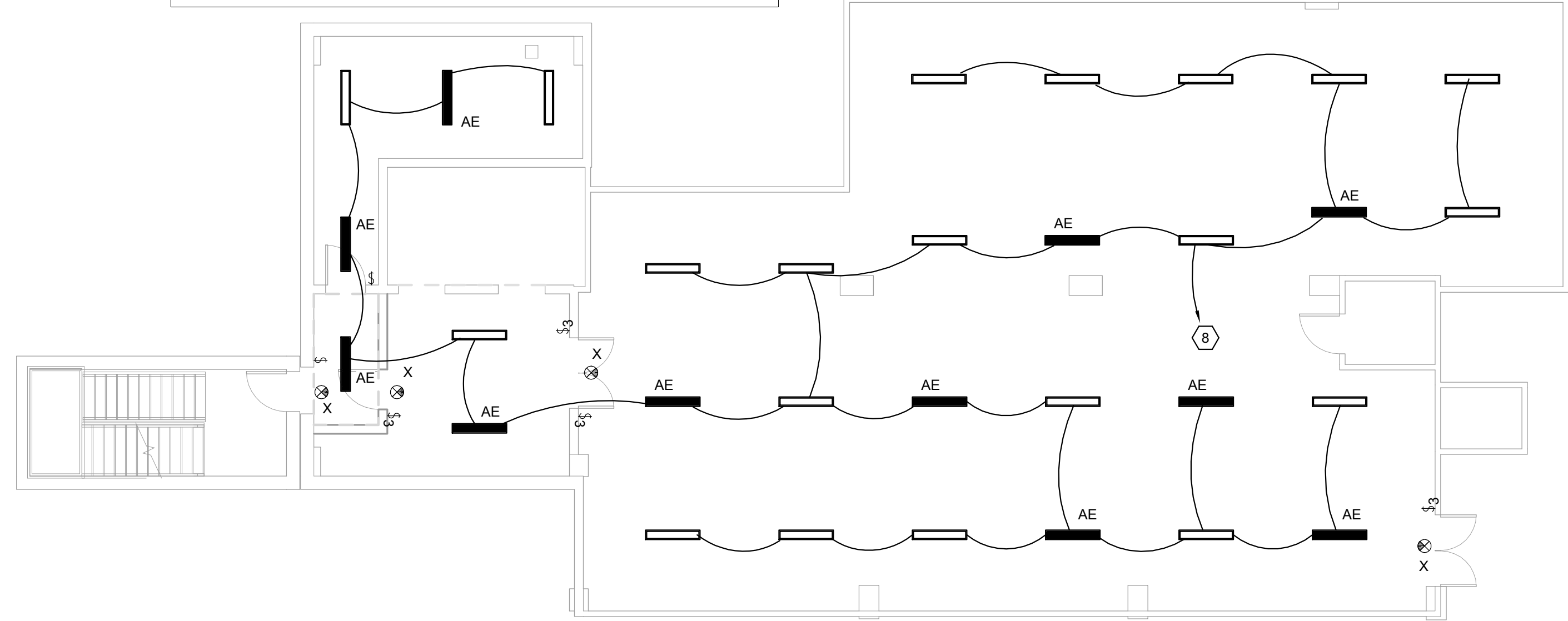


2 ELECTRICAL DEMO PLAN - BASEMENT
1/8" = 1'-0"



4 ELECTRICAL/MECHANICAL PLAN - BASEMENT
1/8" = 1'-0"

NOTE: ALL FIXTURES ARE TYPE 'A' UNLESS NOTED OTHERWISE.



1 LIGHTING PLAN - BASEMENT
1/8" = 1'-0"

DX SPLIT SYSTEM SCHEDULE	
PROJECT: SAHA FAIR AVENUE	
SYSTEM NUMBER	1
SERVICES	FIRE PUMP RM
	FAN COIL
TAG	FCU-1
CONFIGURATION	WALL MOUNTED
SUPPLY CFM	850
FAN POWER	0.125 HP
VOLTS/PH/CYCLES	208/1/60
BTUH, SENSIBLE	22.2
BTUH, TOTAL	29.5
ENT DB/WB, °F	75/63
LVG DB/WB, °F	55/54
FILTER TYPE	1" THROWAWAY
FACTORY DISCONNECT	YES
SINGLE POINT WIRING	YES
CONCEALED CONDENSATE PUMP	YES
REFRIGERANT	R-410A
LG MODEL OR EQUAL	LSN243HLV
	HEAT
TYPE	HEAT PUMP
MBTUH, HEAT	25.3
ENT / LVG DB, °F	72 / 90
	CONDENSING UNIT
TAG	CU-1
AMBIENT TEMP, °F	95
MINIMUM SYSTEM ARI SEER	21.5
SPEED	SINGLE
OPERATES DOWN TO, °F	14
VOLTS/PH/CYCLES	208/1/60
LG MODEL OR EQUAL	LSU243HLV

NOTES

- REQUIRED BTUHS ARE NET; FAN HEAT HAS BEEN SUBTRACTED
- SINGLE POINT ELEC CONNECTION INCLUDES INTERNAL FUSING AND CONTACTORS FOR STARTERS FOR MOTORS

LIGHT FIXTURE SCHEDULE						
TYPE	MFG. AND CATALOG NO.	DESCRIPTIONS	MOUNTING	LAMP (QTY., WATT & TYPE)	VOLTS	REMARKS
A	LITHONIA LZ1N L48 5000LM MVOLT 35K 80CRI WH	LED STRIP LIGHT FIXTURE	SUSPENDED	34W LED	120	1,2,3
AE	LITHONIA LZ1N L48 5000LM MVOLT 35K 80CRI WH	SAME AS 'A' WITH 90-MIN BATTERY BACKUP	SUSPENDED	34W LED	120	1,2,3
X	LITHONIA LRP CR 1 GC 120/277 EL N	EXIT SIGN WITH 90-MIN BATTERY BACKUP	SURFACE	2W LED	UNV	1,2

- NOTES:
- SELECTIONS TO BE APPROVED BY OWNER PRIOR TO PURCHASE.
 - COORDINATE FINISHES WITH OWNER PRIOR TO PURCHASE.
 - COORDINATE EXACT LOCATIONS OF FIXTURES IN FIELD WITH EXISTING CONDITIONS. FIXTURES SHALL BE SUPPORTED FROM THE STRUCTURE ABOVE.

KEYED NOTES

- ROUTE MI CABLE OVERHEAD TO FIRE PUMP CONTROLLER. VERIFY ROUTING IN FIELD. REFER TO RISER DIAGRAM FOR MORE INFO.
- DEMO WIRE/CONDUIT AND CONTROL WIRES BACK TO SOURCE PANEL. MARK AS SPARE.
- NEW WALL MOUNTED DX MINI SPLIT SYSTEM. EXACT LOCATION SHALL BE COORDINATED IN FIELD WITH OTHER EQUIPMENT. PROVIDE CONCEALED CONDENSATE PUMP POWERED BY INDOOR UNIT. ROUTE DRAIN LINE TO NEAREST FLOOR DRAIN IN ROOM.
- COORDINATE INSTALLATION OF SUMP PUMP CONTROLLER WITH PLUMBING CONTRACTOR. REFER TO SUMP PUMP MANUFACTURER INSTALLATION INSTRUCTIONS AND WIRING DIAGRAMS.
- COORDINATE EXACT LOCATION OF VFD WITH MECHANICAL CONTRACTOR. PROVIDE FEEDER FROM MDP TO VFD AND FROM VFD TO CONTROL PANEL/MOTOR.
- INDOOR UNIT POWERED FROM ASSOCIATED OUTDOOR UNIT. PROVIDE WIRING/CONDUIT BETWEEN UNITS PER MANUFACTURER'S RECOMMENDATIONS.
- NEW CONDENSING UNIT ON 4" CONCRETE HOUSEKEEPING PAD. FIELD VERIFY EXACT AND FINAL LOCATION PRIOR TO INSTALLATION ON GROUND LEVEL. ROUTE REFRIGERANT LINES TO FCU-1 IN BASEMENT FIRE PUMP ROOM.
- CONNECT TO EXISTING 120V LIGHTING CIRCUIT SERVING THIS ROOM. CONTRACTOR SHALL VERIFY CAPACITY OF EXISTING CIRCUIT IS ADEQUATE. DO NOT EXCEED 16A ON A SINGLE 20A/1P CIRCUIT.
- NEW REFRIGERANT LINES SHALL BE ROUTED FROM FCU-1 TO CU-1. COORDINATE ROUTING IN FIELD. CONTRACTOR SHALL SIZE REFRIGERANT LINE SET PER MANUFACTURER'S RECOMMENDATION. PROVIDE ASTM C280, TYPE ACR HARD DRAWN OF ANNEALED COOPER TUBING WITH 1" ARMAFLEX INSULATION. CONTRACTOR SHALL USE FACTORY SEALED LINE SETS AND PROVIDE ALL REQUIRED SOLENOID VALVES, TRAPS AND/OR ACCUMULATORS AS REQUIRED.

Date	Description	No.
05/24/18	ISSUE FOR PERMIT	1
07/06/18	REVISION 01	
08/17/18	ISSUE FOR BID	

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08-15-18

PROJECT NUMBER 7917053.00
DRAWN BY D. Lukert
CHECKED BY C. Clements
SHEET DATE 08/17/18

ME PLAN - BASEMENT

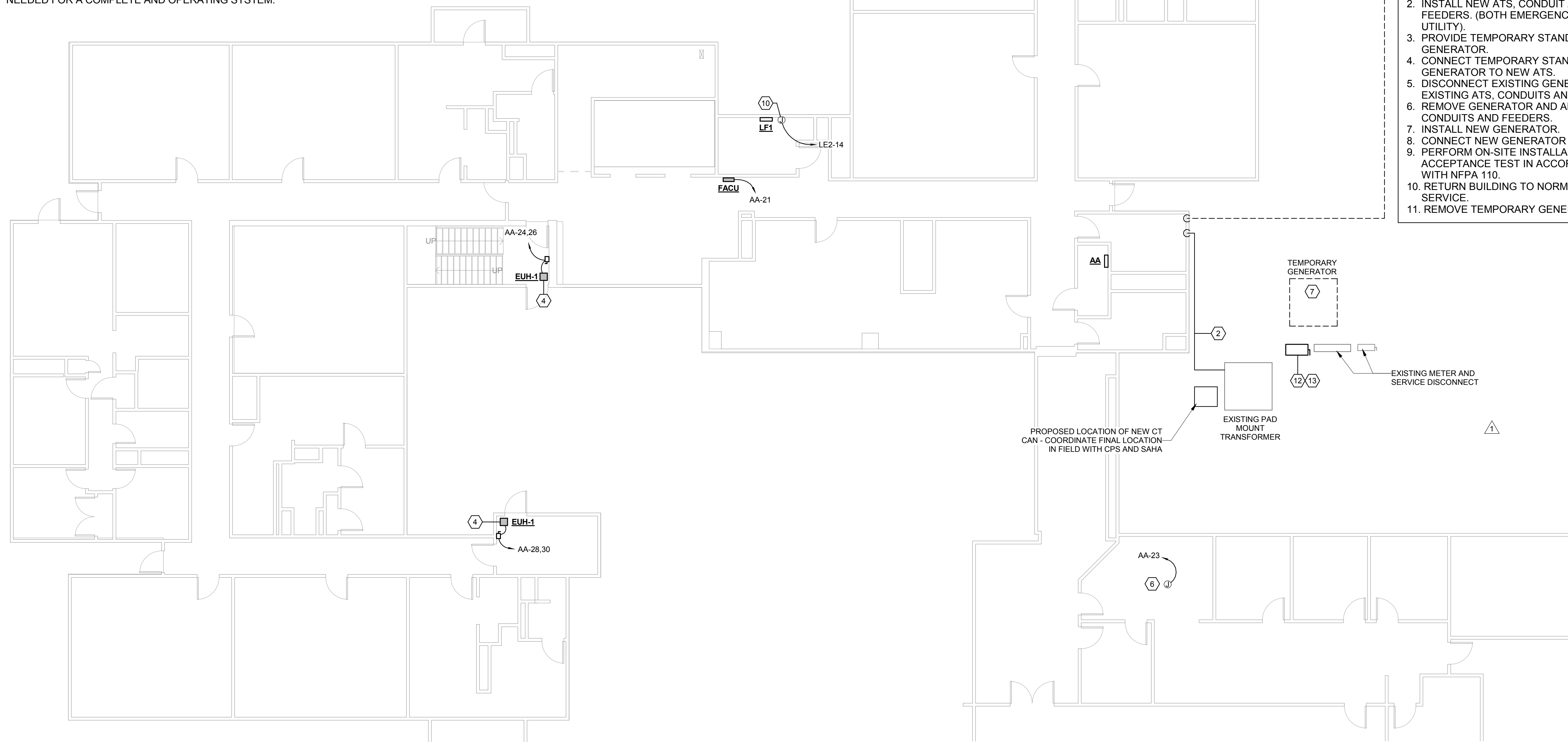
ME.100

KEYED NOTES

- 1 APPROXIMATE FEEDER ROUTING FROM NEW GENERATOR TO NEW FIRE PUMP CONTROLLER. FIELD VERIFY EXACT ROUTING. SAW-CUT PARKING LOT AND TRENCH AS REQUIRED. COORDINATE WORK WITH OWNER.
- 2 PROVIDE SEPERATE NEW FEEDER FROM XFMR TO NEW FIRE PUMP CONTROLLER. FOLLOW PATH OF EXISTING BUS DUCT AND MAKE PENETRATION INTO BASEMENT LEVEL.
- 3 DEMO EXISTING GENERATOR AND REPLACE WITH NEW. PROTECT FEEDERS FROM EXISTING GENERATOR IN PLACE AND RECONNECT TO NEW GENERATOR. EXTEND CONDUIT AND WIRE AS REQUIRED FOR RECONNECTION. COORDINATE TEMPORARY GENERATOR REQUIREMENTS AND PHASING WITH OWNER PRIOR TO BID.
- 4 CONTRACTOR SHALL MOUNT EUH-1 HIGH TO STRUCTURE. COORDINATE FINAL LOCATION WITH EXISTING CONDITIONS IN FIELD.
- 5 DEMO EXISTING CHAIN LINK FENCE AND REPLACE WITH NEW SCREEN WALL. PROVIDE AMERISTAR WIRE WORKS ANTI-CLIMB WALL SYSTEMS WITH DOUBLE-GATE OR EQUAL. MAINTAIN A 4' CLEARANCE FROM THE GENERATOR IN ALL DIRECTIONS. COORDINATE MESH, RAIL AND POST COLOR WITH SAHA PRIOR TO PURCHASE. SEE SHEET E.400 FOR DETAILS.
- 6 GENERATOR ANNUNCIATOR PANEL TO BE LOCATED IN SAHA OFFICE. CONFIRM EXACT LOCATION W/ SAHA.
- 7 CONTRACTOR SHALL PROVIDE TEMPORARY 125KW ROLL-UP GENERATOR WITH 12-HOUR TANK. MAKE TEMPORARY CONNECTION AT EXISTING ATS1 AND ATS2 IN BASEMENT. PROVIDE ALL WIRING AND ACCESSORIES NEEDED FOR A COMPLETE AND OPERATING SYSTEM.

KEYED NOTES

- 8 PROVIDE (3) JUNCTION BOXES FOR GENERATOR AUXILIARY CIRCUITS. (1) FOR BATTERY CHARGER, (1) FOR ENGINE HEATER AND (1) FOR ALTERNATOR. COORDINATE EXACT REQUIREMENTS WITH GENERATOR MANUFACATURER.
- 9 PROVIDE SEPERATE 1" UNDERGROUND CONDUIT TO GENERATOR ANNUNCIATOR PANEL FOR CONTROL WIRING. COORDINATE QUANTITY AND SIZE OF WIRES WITH GENERATOR MANUFACATURER.
- 10 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.
- 11 MANUAL EMERGENCY SHUT OFF CONTROL FOR GENERATOR PER NFPA 110.
- 12 DISCONNECT SHALL BE IDENTIFIED AS SUITABLE FOR USE AS SERVICE EQUIPMENT; LOCKABLE IN THE CLOSED POSITION; NOT LOCATED W/IN EQUIP THAT FEEDS LOADS OTHER THAN THE FIRE PUMP; LOCATED SUFFICIENTLY REMOTE FROM OTHER BLDG OR FIRE PUMP SOURCE DISCONNECTING MEANS; MARKED 'FIRE PUMP SOURCE DISCONNECTING MEANS'; LETTERS MUST BE AT LEAST 1" HIGH, PEOPLE MUST BE ABLE TO SEE THEM W/OUT OPENING ENCLOSURE DOORS OR COVERS. COORDINATE WITH FIRE MARSHALL ON EXACT LOCATION.
- 13 MOUNT NEW DISCONNECT FOR FIRE PUMP ON NEW UNISTRUT RACK ADJACENT TO EXISTING METER ENCLOSURE AND UTILITY TRANSFORMER. COORDINATE EXACT INSTALLATION LOCATION IN FIELD WITH CPS AND SAHA. ENSURE WORKING CLEARANCES REQUIRED PER NEC ARE MAINTAINED.



GENERATOR CONSTRUCTION SEQUENCE

1. THE BUILDING SHALL REMAIN IN SERVICE DURING CONSTRUCTION. UTILITY POWER, GENERATOR POWER AND COMMUNICATIONS SHALL BE MAINTAINED.
2. INSTALL NEW ATS, CONDUIT AND FEEDERS. (BOTH EMERGENCY AND UTILITY).
3. PROVIDE TEMPORARY STANDBY GENERATOR.
4. CONNECT TEMPORARY STANDBY GENERATOR TO NEW ATS.
5. DISCONNECT EXISTING GENERATOR, EXISTING ATS, CONDUITS AND FEEDERS.
6. REMOVE GENERATOR AND ABANDONED CONDUITS AND FEEDERS.
7. INSTALL NEW GENERATOR.
8. CONNECT NEW GENERATOR TO ATS.
9. PERFORM ON-SITE INSTALLATION ACCEPTANCE TEST IN ACCORDANCE WITH NFPA 110.
10. RETURN BUILDING TO NORMAL SERVICE.
11. REMOVE TEMPORARY GENERATOR AND

1 ELECTRICAL PLAN - LEVEL 1
1/8" = 1'-0"

No.	Description	Date
1	ISSUE FOR PERMIT	05/24/18
	REVISION 01	07/05/18

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08-15-18

PROJECT NUMBER 7917053.00
DRAWN BY D. Lukert
CHECKED BY C. Clements
SHEET DATE 08/17/18

ME PLAN - LEVEL 1

ME.101

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 2
1/8" = 1'-0"

No.	Description	Date
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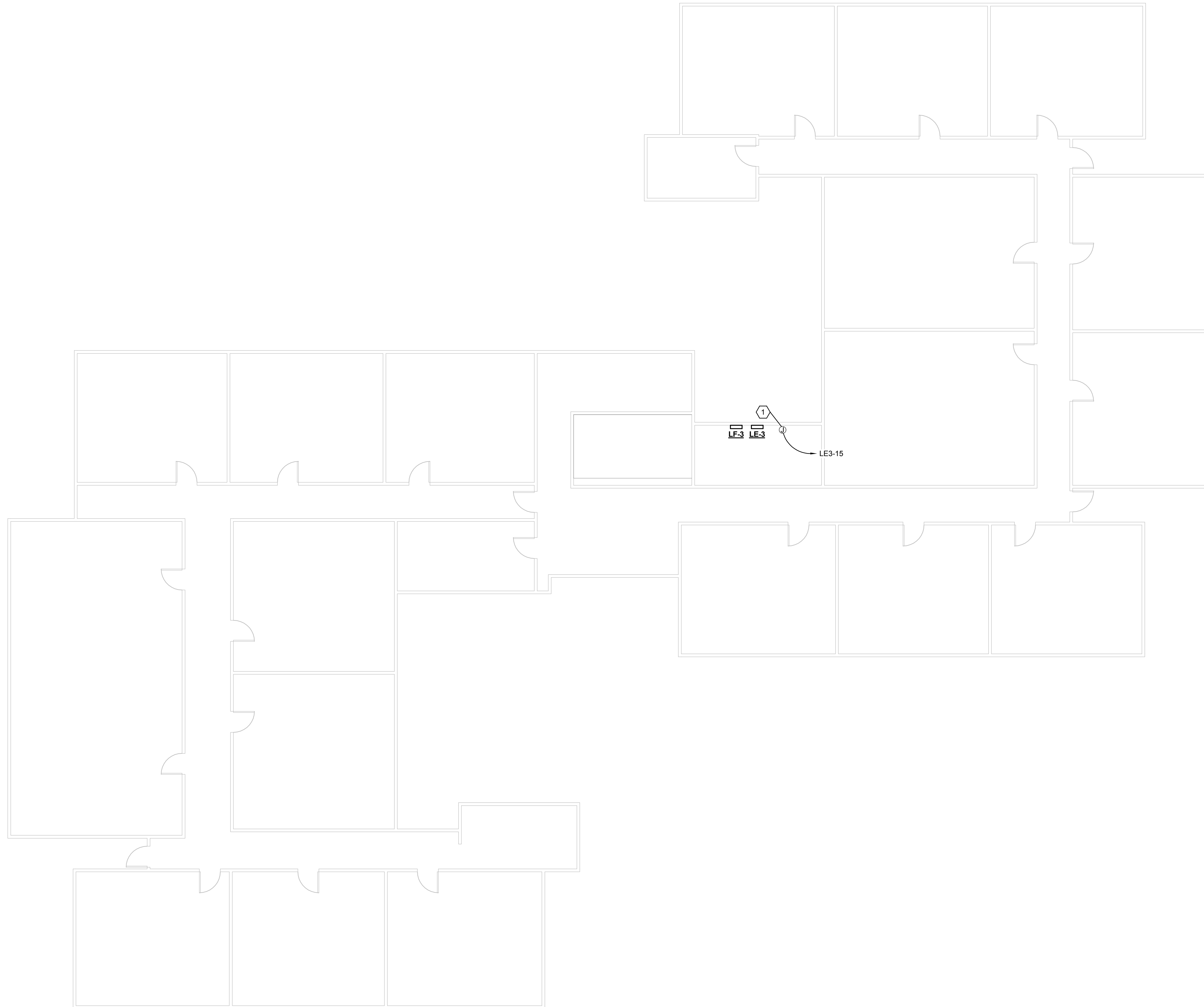
SHEET DATE
08/17/18

ME PLAN - LEVEL 2

ME.102

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 3
1/8" = 1'-0"

No.	Description	Date
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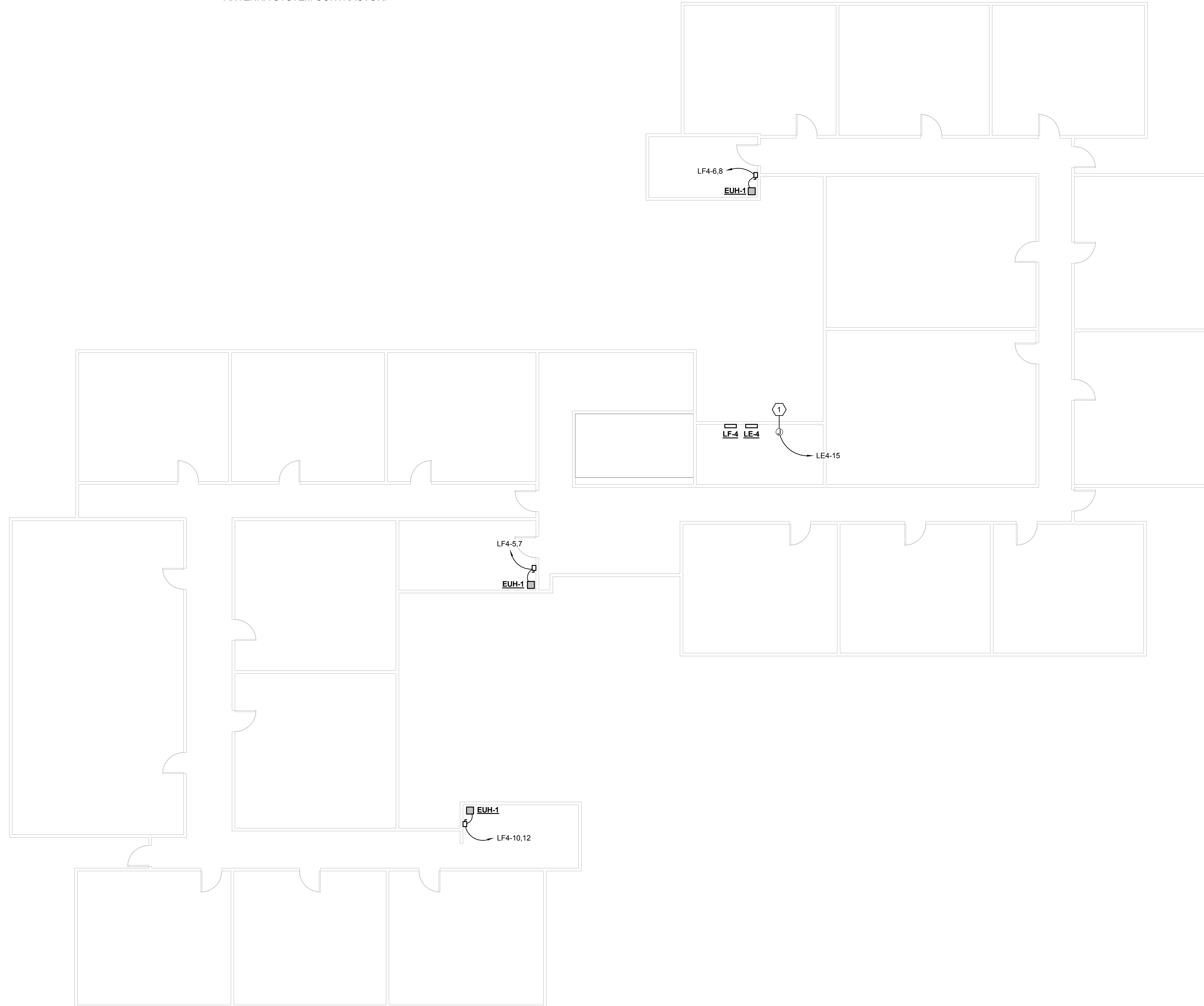
SHEET DATE
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ME PLAN - LEVEL 3

ME.103

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 4
1/8" = 1'-0"

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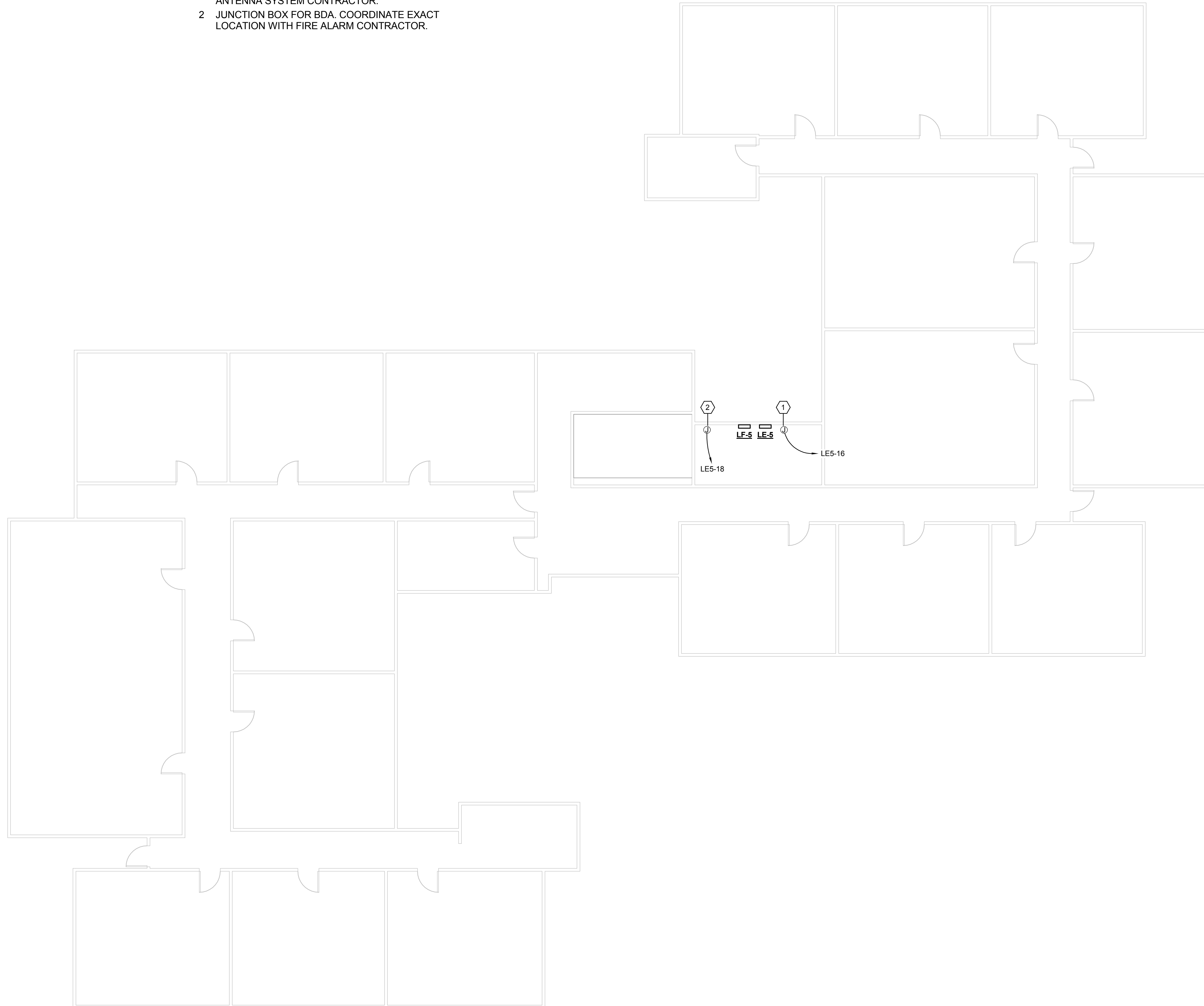
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ME PLAN - LEVEL 4

ME.104

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.
- 2 JUNCTION BOX FOR BDA. COORDINATE EXACT LOCATION WITH FIRE ALARM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 5
1/8" = 1'-0"

No.	Description	Date
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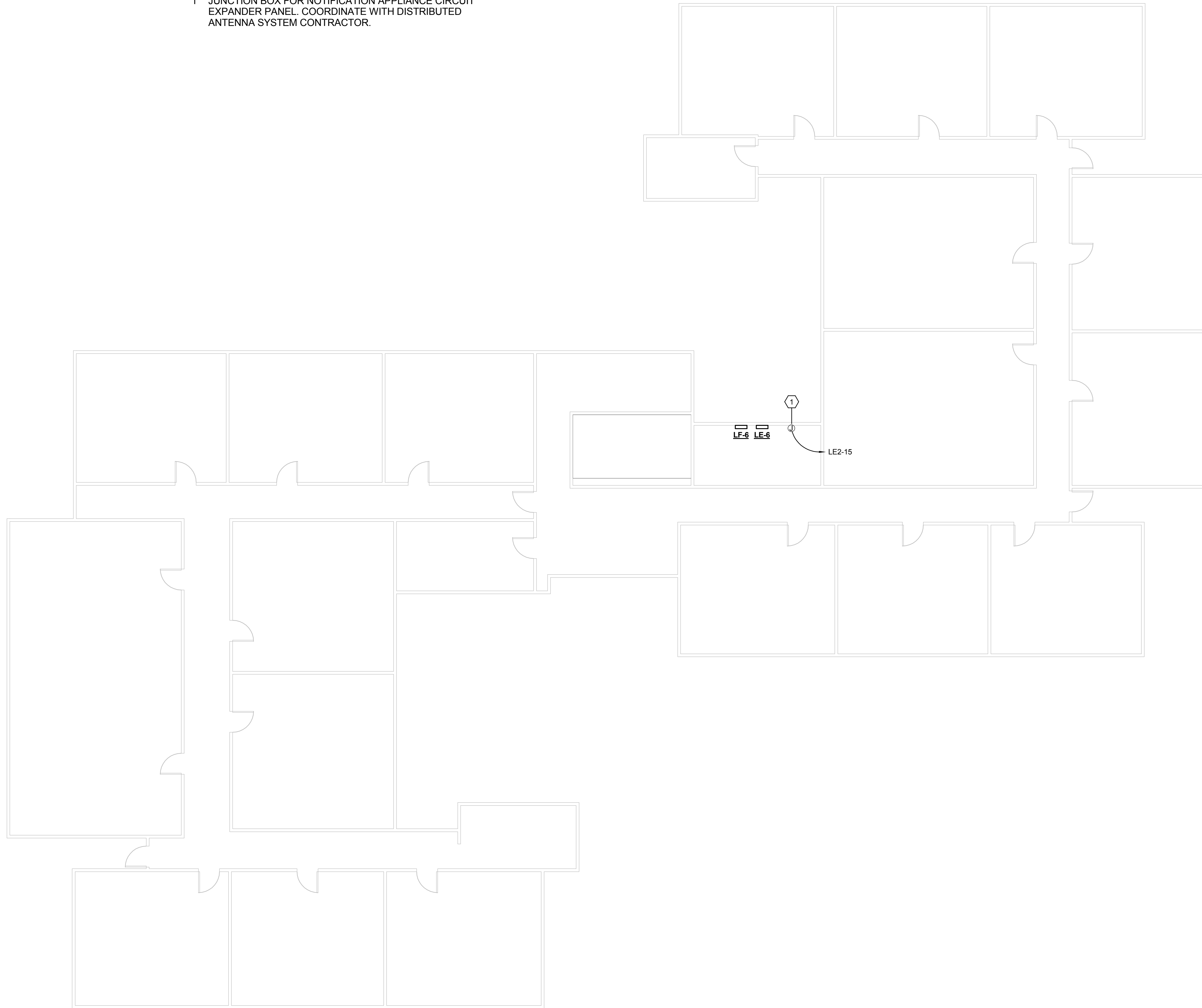
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ME PLAN - LEVEL 5

ME.105

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 6
1/8" = 1'-0"

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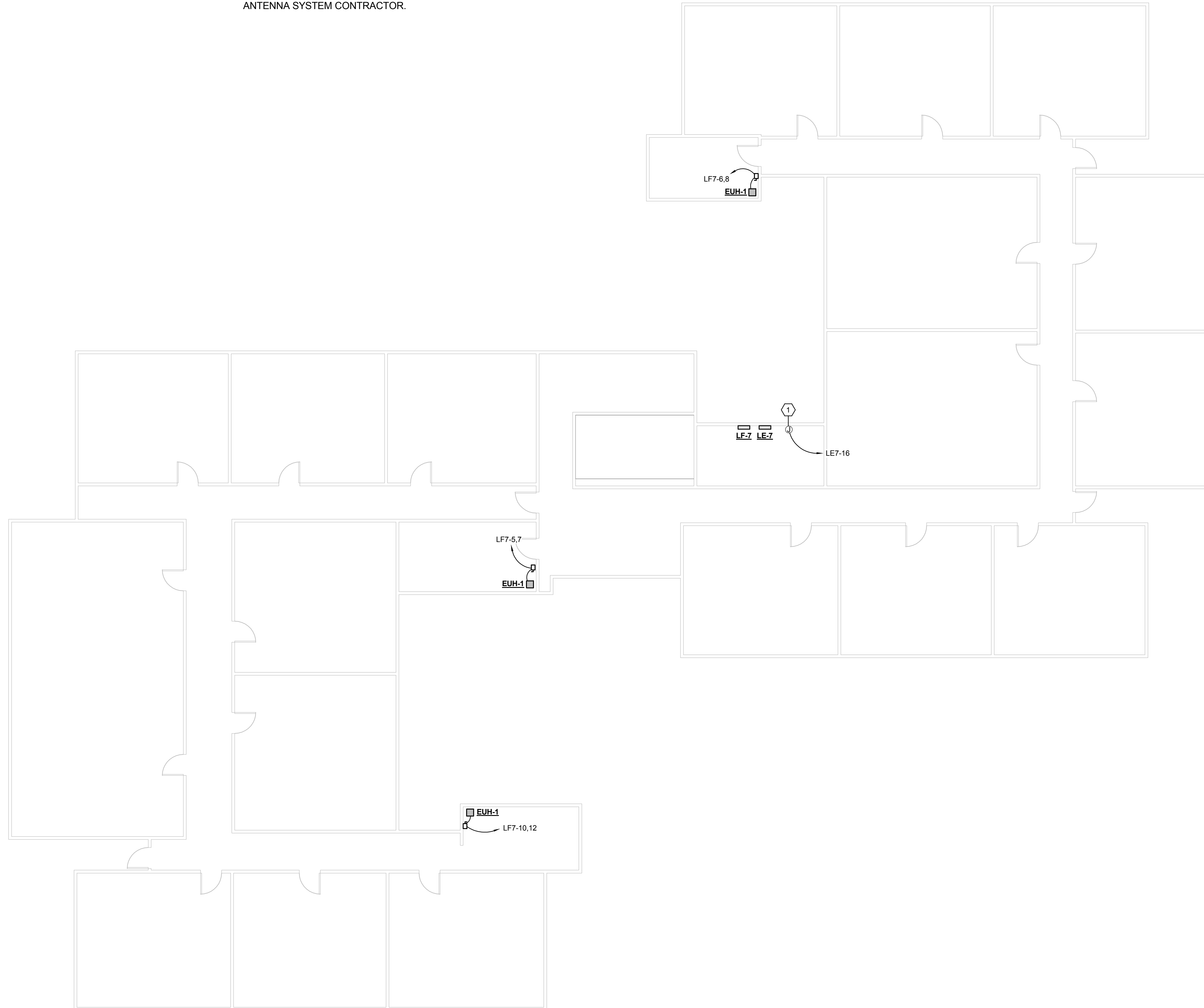
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ME PLAN - LEVEL 6

ME.106

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 7
1/8" = 1'-0"

No.	Description	Date
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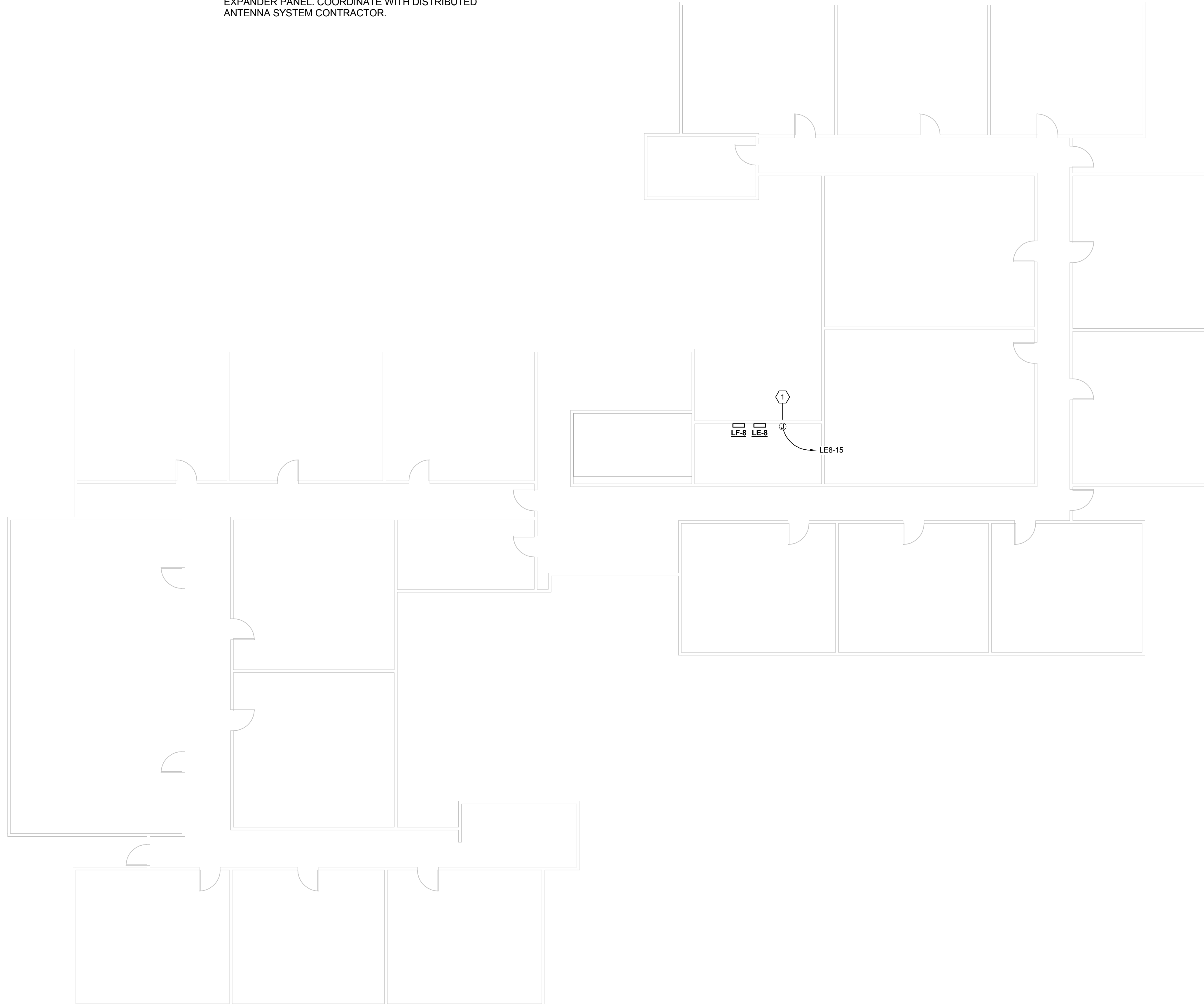
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ME PLAN - LEVEL 7

ME.107

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 8
1/8" = 1'-0"

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ME PLAN - LEVEL 8

ME.108

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 9
1/8" = 1'-0"

No.	Description	Date
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 SAN ANTONIO, TX 78223
 Ph: (210) 444-3751
 Texas Registered Engineering Firm F-10573

08-15-18

PROJECT NUMBER
7917053.00

DRAWN BY
D. Lukert

CHECKED BY
C. Clements

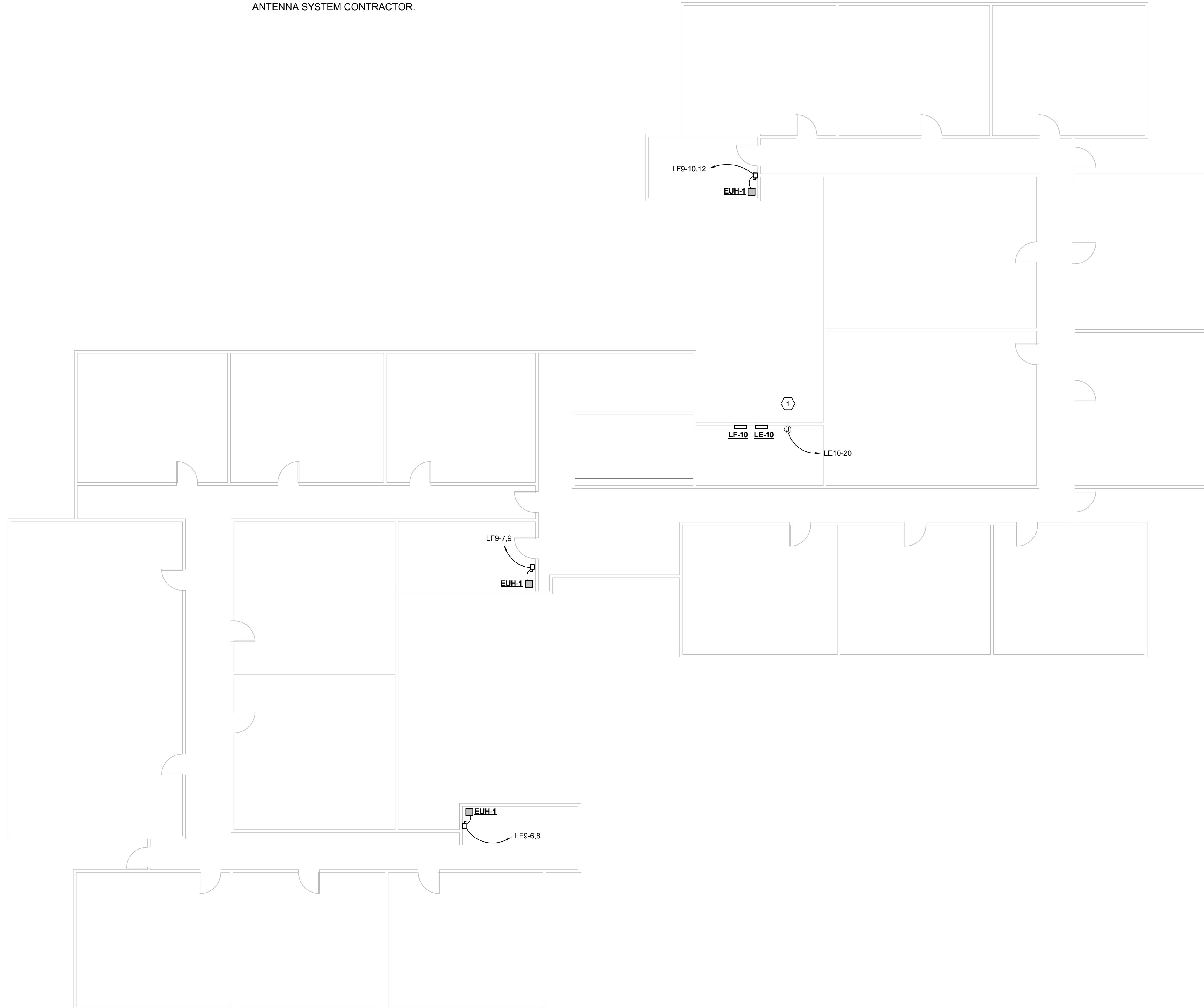
SHEET DATE
08/17/18

ME PLAN - LEVEL 9

ME.109

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 10
1/8" = 1'-0"

No.	Description	Date
	ISSUE FOR PERMIT	05/24/18
	ISSUE FOR BID	08/17/18

FAIR AVENUE APARTMENTS SPRINKLER DESIGN
 SAN ANTONIO HOUSING AUTHORITY
 1215 FAIR AVENUE
 SAN ANTONIO, TEXAS

KCI
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 PLANNERS
 SCIENTISTS
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ME PLAN - LEVEL 10

ME.110

KEYED NOTES

- 1 JUNCTION BOX FOR NOTIFICATION APPLIANCE CIRCUIT EXPANDER PANEL. COORDINATE WITH DISTRIBUTED ANTENNA SYSTEM CONTRACTOR.



1 ELECTRICAL PLAN - LEVEL 11
1/8" = 1'-0"

No.	Description	Date
	ISSUE FOR PERMIT	05/24/18
	ISSUE FOR BID	08/17/18

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08-15-18

PROJECT NUMBER
7917053.00

DRAWN BY
D. Lukert

CHECKED BY
C. Clements

SHEET DATE
08/17/18

ME PLAN - LEVEL 11

ME.111

FIRE PUMP FEEDER SCHEDULE			
DESCRIPTION	LOAD (KVA / AMP)	WIRE/CONDUIT SIZE (FROM BREAKER TO CONTROLLER)	WIRE/CONDUIT SIZE (FROM CONTROLLER TO MOTOR)
FP-1 150HP	47.6 / 396	(2)RUNS OF 3#250KCM, 1#2G, 3"C	(2)RUNS OF 3#3/0, 1#3G, 2-1/2"C

GENERATOR LOAD ANALYSIS
SAHA 1215 FAIR AVE

SERVICE VOLTAGE: 208Y/120V, 3 PHASE, 4 WIRE

	CONN. LOAD KVA	DIV. %	CALCULATED LOAD KVA	CALCULATED LOAD KW	CALCULATED LOAD AMP	COMMENTS
1 LIGHTS		21.0	125	26.3	21.0	72.9
2 RECEPTACLES						NEC Art. 220.44
3 COOLING LOADS - HVAC						
4 HEATING LOADS - HVAC (non-coincident w/cooling)						
5 HEATING LOADS - HVAC (coincident w/cooling)						
6 MOTOR	187.3		187.3	149.9	520.0	
7 MISC. NON-CONTINUOUS LOADS	9.0	100%	9.0	7.2	25.0	
8 MISC. CONTINUOUS LOADS						
9 KITCHEN LOADS						
10 OUTSIDE LIGHTING						
11 NON-COINCIDENT LOADS						
12 TRANSFORMER SPARE CAPACITY						
13 FIRE PUMP 150HP	142.7		142.7	114.1	396.0	
TOTAL LOADS	360.0 kva		365.2 kva	292.2 kw	1,013.8 A	

	CONN. LOAD(KVA)	CONN. LOAD(KW)	CALCULATED LOAD (KVA)	CALCULATED LOAD(KW)	CALCULATED LOAD (AMP)
100% x "TOTAL LOADS" above	360.0 kva	288 kw	365.2 kva	292.2 kw	1,013.8 A
Standard Generator size closest to line above			375.0 kva	300.0 kw	1,040.9 A
125% x "TOTAL LOADS" above	450.0 kva	360 kw	456.6 kva	365.2 kw	1,267.3 A
Standard Generator size closest to line above			562.5 kva	450.0 kw	1,561.4 A
Proposed Generator Size			312.5 kva	300 KW	867.4 A

208Y/120V 3PH 4W, Full size neutral w/copper ground bus

PANEL "MDP-2"
Copper Bus Rating 1,600 AMP
Mains Rating (M.C.B.) 1,600 AMP

Existing Panel: Isolated Ground Bus
Location: Surface
Mounting: Enclosure (NEMA) 1

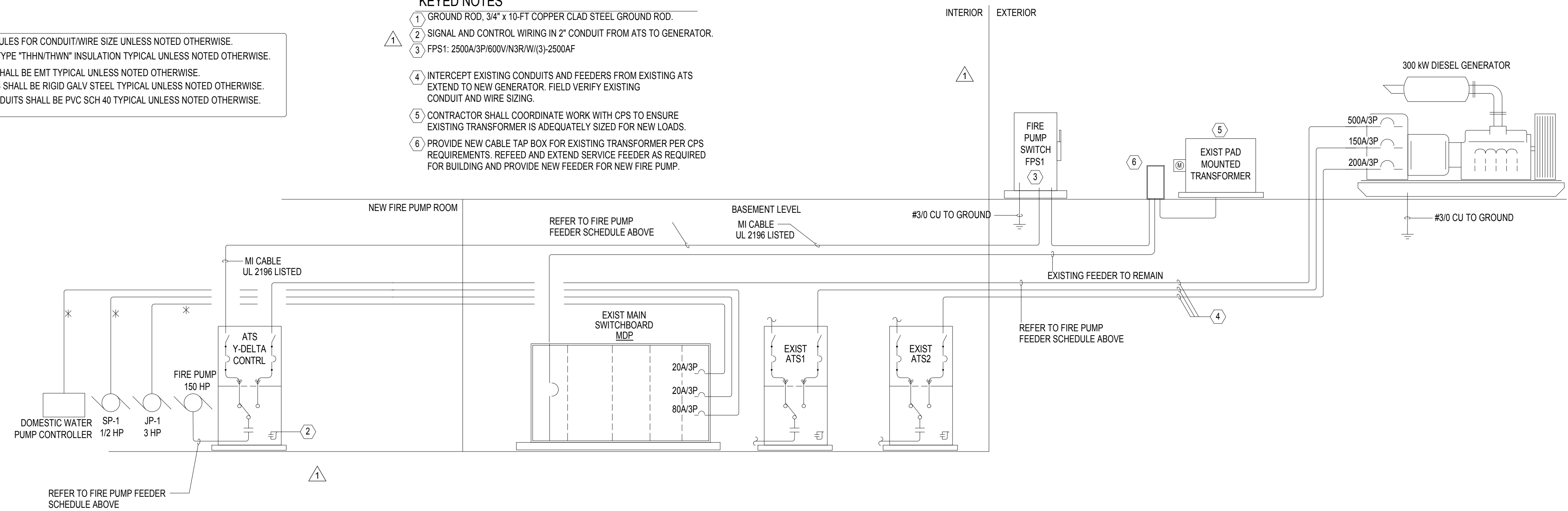
LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	CKT #	PH	CKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
SPACE					/1	1	A	2	/1					SPACE
SPACE					/1	3	B	4	/1					SPACE
SPACE					/1	5	C	6	/1					SPACE
EXISTING LOAD		12.0	100.0		250	/3	7	A	8	/1				SPACE
*** 100 FLA 36.0 KVA		12.0	100.0				9	B	10	/1				SPACE
***		12.0	100.0				11	C	12	20	/1			SPACE
EXISTING LOAD		0.40	3.3		20	/1	13	A	14	20	/1	3.3	0.40	EXISTING LOAD
EXISTING LOAD		0.40	3.3		20	/1	15	B	16	20	/1	3.3	0.40	EXISTING LOAD
EXISTING LOAD		0.40	3.3		20	/1	17	C	18	20	/1	3.3	0.40	EXISTING LOAD
EXISTING LOAD		0.6	5.0		15	/3	19	A	20	90	/3	45.0	5.4	EX PANEL BP
*** 5 FLA 1.8 KVA		0.6	5.0				21	B	22		45.0	5.4	*** 45 FLA 16.2 KVA	
***		0.6	5.0				23	C	24		45.0	5.4	***	
JOCKEY PUMP	MT	1.3	10.6	4#12, 1#12G, 3/4"C	20	/3	25	A	26	30	/3	0.0	0.0	SPARE
** 3HP 10.4FLA (VFD furnished by HVAC, installed & wired by E.C.)	MT	1.3	10.6	#12-25amp			27	B	28		0.0	0.0	***	
Disc30A/3P/240V/NEMA1	MT	1.3	10.6				29	C	30		0.0	0.0	*	
SUMP PUMP, 1/2HP Disc30A/2P/240V/N1	MT	1.2	9.8	2#12, 1#12G, 3/4"C	20	/1	31	A	32	50	/3	15.0	1.8	EXISTING LOAD
SPACE					/1	33	B	34			15.0	1.8	*** 15 FLA 5.4 KVA	
SPACE					/1	35	C	36			15.0	1.8	***	
SPACE					/1	37	A	38	50	/3	15.0	1.8	EXISTING LOAD	
SPACE					/1	39	B	40			15.0	1.8	*** 15 FLA 5.4 KVA	
SPACE					/1	41	C	42			15.0	1.8	***	
EXISTING LOAD		1.8	15.0		50	/3	43	A	44	60	/3	15.0	1.8	EXISTING LOAD
*** 15 FLA 5.4 KVA		1.8	15.0				45	B	46		15.0	1.8	*** 15 FLA 5.4 KVA	
***		1.8	15.0				47	C	48		15.0	1.8	***	
SPACE					/1	49	A	50	175	/3	50.0	6.0	EXISTING LOAD	
SPACE					/1	51	B	52			50.0	6.0	*** 50 FLA 18.0 KVA	
SPACE					/1	53	C	54			50.0	6.0	***	
DWP-1	MT	6.0	50.1	4#4, 1#8G, 1 1/4"C	80	/3	55	A	56	150	/3	50.0	6.0	EXISTING LOAD
** (3) 3HP (VFD furnished by HVAC, installed & wired by E.C.)	MT	6.0	50.1	#4-85amp			57	B	58		50.0	6.0	*** 50 FLA 18.0 KVA	
Disc30A/3P/240V/NEMA1	MT	6.0	50.1				59	C	60		50.0	6.0	*	
EXISTING LOAD		6.0	50.0		125	/3	61	A	62	175	/3	50.0	6.0	EXISTING LOAD
*** 50 FLA 18.0 KVA		6.0	50.0				63	B	64		50.0	6.0	*** 50 FLA 18.0 KVA	
***		6.0	50.0				65	C	66		50.0	6.0	***	

PANEL "MDP-2" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	LOAD (KVA)		NEC CALCULATION REFERENCE
			CONNECTED	CALCULATED	
MOTOR	MT	1	23.0	23.0	
		1	150.5	150.5	
25% LARGEST MOTOR (18.0 KVA)		0.25		4.5	
TOTAL LOAD (KVA)			173.5 KVA	178.1 KVA	
TOTAL LOAD (AMP AVG)			481.7 AMP	494.2 AMP	Calc'd Amps: PHA=500A, PRB=400A, PHC=300A, NEUT=9A

* REFER TO PANEL SCHEDULES FOR CONDUIT/WIRE SIZE UNLESS NOTED OTHERWISE.
ALL WIRES SHALL HAVE TYPE "THHN/THWN" INSULATION TYPICAL UNLESS NOTED OTHERWISE.
ALL INDOOR CONDUITS SHALL BE EMT TYPICAL UNLESS NOTED OTHERWISE.
ALL OUTDOOR CONDUITS SHALL BE RIGID GALV STEEL TYPICAL UNLESS NOTED OTHERWISE.
ALL UNDERGROUND CONDUITS SHALL BE PVC SCH 40 TYPICAL UNLESS NOTED OTHERWISE.

- KEYED NOTES**
- GROUND ROD, 3/4" x 10-FT COPPER CLAD STEEL GROUND ROD.
 - SIGNAL AND CONTROL WIRING IN 2" CONDUIT FROM ATS TO GENERATOR.
 - FPS1: 2500A/3P/600V/N3R/W(3)-2500AF
 - INTERCEPT EXISTING CONDUITS AND FEEDERS FROM EXISTING ATS EXTEND TO NEW GENERATOR. FIELD VERIFY EXISTING CONDUIT AND WIRE SIZING.
 - CONTRACTOR SHALL COORDINATE WORK WITH CPS TO ENSURE EXISTING TRANSFORMER IS ADEQUATELY SIZED FOR NEW LOADS.
 - PROVIDE NEW CABLE TAP BOX FOR EXISTING TRANSFORMER PER CPS REQUIREMENTS. REFEED AND EXTEND SERVICE FEEDER AS REQUIRED FOR BUILDING AND PROVIDE NEW FEEDER FOR NEW FIRE PUMP.



1 ELECTRICAL RISER DIAGRAM
1/8" = 1'-0"

No.	Description	Date
	PROGRESS SET	08/06/17
	ISSUE FOR PERMIT	08/24/18
1	REVISION 01	07/06/18
	ISSUE FOR BID	08/17/18

FAIR AVENUE APARTMENTS SPRINKLER DESIGN
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PROJECT NUMBER 7917053.00
DRAWN BY D. Lukert
CHECKED BY C. Clements
SHEET DATE 08/17/18
ELECTRICAL RISER AND LOAD ANALYSIS

ME.201

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "AA"

Copper Bus Rating **225 AMP**
Mains Rating (M.L.O.) **225 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 230A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	5	C	6	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	7	A	8	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	9	B	10	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	11	C	12	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	13	A	14	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	15	B	16	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	17	C	18	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	19	A	20	20 /1		3.3	0.40		EXISTING LOAD
FIRE ALARM PANEL	MIS	1.00	8.3	2#12, 1#12G, 1/2" C	20 /1	21	B	22			14.4	1.5	H	EUH-1
GEN ANNUNCIATOR	MIS	0.50	4.2	2#10, 1#10G, 3/4" C	20 /1	23	C	24	20 /2	3#10, 1#10G, 3/4" C (Note 3)	14.4	1.5	H	EUH-1
GEN BATTERY CHARGER	MIS	0.50	4.2	2#10, 1#10G, 3/4" C (Voltage Drop)	20 /1	25	A	26			14.4	1.5	H	EUH-1
GEN ENGINE HEATER	MIS	0.50	4.2	2#10, 1#10G, 3/4" C (Voltage Drop)	20 /1	27	B	28	20 /2	3#10, 1#10G, 3/4" C (Note 3)	14.4	1.5	H	EUH-1
GEN ALTERNATOR	MIS	0.50	4.2	2#10, 1#10G, 3/4" C (Voltage Drop)	20 /1	29	C	30			14.4	1.5	H	EUH-1
1.D.R.	R	0.18	1.5	2#10, 1#10G, 3/4" C (Voltage Drop)	20 /1	31	A	32	30 /2	3#10, 1#10G, 3/4" C (Note 3)	19.0	2.0	C	FCU-1
1.D.R.	R	0.18	1.5	2#10, 1#10G, 3/4" C (Voltage Drop)	20 /1	33	B	34			19.0	2.0	C	FCU-1
SPACE					/1	35	C	36	/1					SPACE
SPACE					/1	37	A	38	/1					SPACE
SPACE					/1	39	B	40	/1					SPACE
SPACE					/1	41	C	42	/1					SPACE

PANEL "AA" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
RECEPTACLES	R	1	0.4	0.4	
COOLING LOADS - HVAC	C	1	4.0	---	Cooling loads smaller than heating
HEATING LOADS - HVAC (non-coincident w/cooling)	H	1	9.0	9.0	Heating loads larger than cooling
MISC. NON-CONTINUOUS LOADS	MIS	1	3.0	3.0	
TOTAL LOAD (KVA)			7.6	7.6	
TOTAL LOAD (AMP AVG)			23.9 AMP	20.0 AMP	Calc'd Amps: PhA=35A, PhB=35A, PhC=35A, Neut=5A

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "LF-4"

Copper Bus Rating **100 AMP**
Mains Rating (M.L.O.) **100 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 100A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	20 /1		3.3	0.40		EXISTING LOAD
EUH-1	H	1.5	14.4	3#12, 1#12G, 1/2" C	20 /2	5	C	6	20 /2	3#10, 1#10G, 3/4" C (Note 3)	14.4	1.5	H	EUH-1
**3KW, 14.4 FLA-Disc30A/2P/240V/NF/N1	H	1.5	14.4		20 /2	7	A	8			14.4	1.5	H	**3KW, 14.4 FLA-Disc30A/2P/240V/NF/N1
SPACE					/1	9	B	10	20 /2	3#10, 1#10G, 3/4" C (Note 3)	14.4	1.5	H	EUH-1
SPACE					/1	11	C	12			14.4	1.5	H	**3KW, 14.4 FLA-Disc30A/2P/240V/NF/N1

PANEL "LF-4" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
COOLING LOADS - HVAC	C	1	---	---	
HEATING LOADS - HVAC (non-coincident w/cooling)	H	1	9.0	9.0	
TOTAL LOAD (KVA)			1.6	1.6	
TOTAL LOAD (AMP AVG)			10.6 AMP	10.6 AMP	Calc'd Amps: PhA=35A, PhB=35A, PhC=35A, Neut=7A

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "LE-5"

Copper Bus Rating **100 AMP**
Mains Rating (M.L.O.) **100 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 100A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	40 /2		15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	5	C	6			15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	7	A	8	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	9	B	10	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	11	C	12	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	13	A	14	/1					SPACE
EXISTING LOAD		0.40	3.3		20 /1	15	B	16	20 /1	2#12, 1#12G, 1/2" C	8.3	1.00	MIS	FA NAC
SPACE					/1	17	C	18	20 /1	2#12, 1#12G, 1/2" C	1.3	0.16	MIS	FA BDA
SPACE					/1	19	A	20	/1					SPACE

PANEL "LE-5" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
MISC. NON-CONTINUOUS LOADS	MIS	1	1.2	1.2	
TOTAL LOAD (KVA)			9.1 KVA	9.1 KVA	
TOTAL LOAD (AMP AVG)			25.2 AMP	25.2 AMP	Calc'd Amps: PhA=17A, PhB=37A, PhC=35A, Neut=6A

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "LE-2"

Copper Bus Rating **100 AMP**
Mains Rating (M.L.O.) **100 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 100A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	5	C	6	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	7	A	8	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	9	B	10	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	11	C	12	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /2	13	A	14	20 /1	2#12, 1#12G, 1/2" C	8.3	1.00	MIS	LEVEL 1 FA NAC
EXISTING LOAD		1.6	15.0		20 /1	15	B	16	20 /1	2#12, 1#12G, 1/2" C	8.3	1.00	MIS	LEVEL 2 FA NAC
SPACE					/1	17	C	18	/1					SPACE
SPACE					/1	19	A	20	/1					SPACE

PANEL "LE-2" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
MISC. NON-CONTINUOUS LOADS	MIS	1	2.0	2.0	
TOTAL LOAD (KVA)			9.9 KVA	9.9 KVA	
TOTAL LOAD (AMP AVG)			27.5 AMP	27.5 AMP	Calc'd Amps: PhA=37A, PhB=37A, PhC=35A, Neut=9A

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "LE-3"

Copper Bus Rating **100 AMP**
Mains Rating (M.L.O.) **100 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 100A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	40 /2		15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	5	C	6			15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	7	A	8	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	9	B	10	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	11	C	12	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	13	A	14	20 /1		3.3	0.40		EXISTING LOAD
FA NAC	MIS	1.00	8.3	2#12, 1#12G, 1/2" C	20 /1	15	B	16	/1					SPACE
SPACE					/1	17	C	18	/1					SPACE
SPACE					/1	19	A	20	/1					SPACE

PANEL "LE-3" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
MISC. NON-CONTINUOUS LOADS	MIS	1	1.0	1.0	
TOTAL LOAD (KVA)			8.9 KVA	8.9 KVA	
TOTAL LOAD (AMP AVG)			24.8 AMP	24.8 AMP	Calc'd Amps: PhA=35A, PhB=35A, PhC=35A, Neut=9A

208Y120V 3Ph 4W full size neutral w/copper ground bus

PANEL "LE-4"

Copper Bus Rating **100 AMP**
Mains Rating (M.L.O.) **100 AMP**
1 run of 4#3, 1 #8 G, 1 1/2" C.
Feeder Ampacity = 100A

MCB Existing Panel
X MLO Isolated Ground Bus
Feed Thru Lugs SEE PLAN Location
Shunt-Trip MCB Surface Mounting

(All Branch Breakers Shall Be Bolt-On Type)

LOAD DESCRIPTION	TYPE	LOAD KVA	LOAD AMP	WIRE/CONDUIT SIZE (Note 1)	TRIPPOLE (Note 2)	PKT #	PH	PKT #	TRIPPOLE (Note 2)	WIRE/CONDUIT SIZE (Note 1)	LOAD AMP	LOAD KVA	TYPE	LOAD DESCRIPTION
EXISTING LOAD		0.40	3.3		20 /1	1	A	2	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	3	B	4	40 /2		15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	5	C	6			15.0	1.6		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	7	A	8	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	9	B	10	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	11	C	12	20 /1		3.3	0.40		EXISTING LOAD
EXISTING LOAD		0.40	3.3		20 /1	13	A	14	/1					SPACE
FA NAC	MIS	1.00	8.3	2#12, 1#12G, 1/2" C	20 /1	15	B	16	/1					SPACE
SPACE					/1	17	C	18	/1					SPACE
SPACE					/1	19	A	20	/1					SPACE

PANEL "LE-4" LOAD ANALYSIS

LOAD DESCRIPTION	TYPE	DEMAND FACTOR	CONNECTED	CALCULATED	NEC CALCULATION REFERENCE
MISC. NON-CONTINUOUS LOADS	MIS	1	1.0	1.0	
TOTAL LOAD (KVA)			7.5	7.5	
TOTAL LOAD (AMP AVG)			8.5 KVA	8.5 KVA	
TOTAL LOAD (AMP AVG)			23.6 AMP	23.6 AMP	Calc'd Amps: PhA=17A, PhB=35A, PhC=35A, Neut=6A

NOTES - PANEL SCHEDULES

Abbreviations: D/R = DUPLEX RECEPTACLE S/R = SINGLE RECEPTACLE PC=PERSONAL COMPUTER HACR=HEATING/AIR CONDITIONING RATED BKR

SWD=SWITCHING DUTY BKR GP=GENERAL PURPOSE E=EXISTING N=NEW

Note 1: Each circuit is shown as an individual homerun. Contractor may elect to combine two or three non-harmonics producing circuits in a common raceway. Contractor shall not install more than three circuits in a common conduit, except where specifically noted and allowed. Where more than three conductors are installed in a common raceway, the ampacity of all current-carrying conductors shall be derated and conductor size increased per N.E.C. 2017 Article 310.15(B)(3)(a). All wires shall have THHN/THWN insulation unless noted otherwise.

Note 2: Voltage drop - Use #10 wires for 20Amp 120V ckt's longer than 75 feet, use #10 wires for 20Amp 277V ckt's longer than 200 feet. All breakers 100Amp or less shall be rated for 75/60C wire termination. Breakers rated for only 60C wire termination shall not be used. All breakers greater than 100Amp shall be rated for 75C termination, N.E.C. 2017 Article 110.14(C)(1).

Note 3: For 3-pole breaker, provide 3 wires + grd where neutral is not used or req'd. Similarly for 2-pole bkr, provide 2 wires + grd if neut. is not req'd.

General Notes:

- (A) Quantity and type of duplex & quad receptacles, light fixtures etc shown in panel schedule are for reference only, refer to plans for exact quantity of outlets, light fixtures and other devices.
- (B) All underground conduit shall be a minimum size of 3/4".
- (C) Each PC circuit shall have separate neutral wire. Do not share neutral wire between 2 or more circuits. Similarly for all harmonics-producing circuits, provide dedicated neutral for each circuit serving such equipment.
- (D) Provide isolated ground for each PC circuit in pre-wired furniture system.
- (E) Provide HACR rated breaker for all air-conditioning/heating eqpt.
- (F) Provide type-written Panel Directory with room name and devices served. Example: OFFICE 124, 3 RECEPTS

IN CASE OF CONFLICTS BETWEEN DRAWINGS, OR SPECS AND DRAWINGS, CONTRACTORS SHALL REQUEST CLARIFICATIONS IN WRITING FROM ARCHITECT/ENGINEER, OTHERWISE THE MORE STRINGENT REQUIREMENTS SHALL BE PROVIDED.

FAIR AVENUE APARTMENTS SPRINKLER DESIGN

SAN ANTONIO, TEXAS

GENERAL NOTES AND ELECTRICAL SPECIFICATIONS

CODE INFORMATION:

APPLICABLE CODES INCLUDE BUT ARE NOT LIMITED TO: NATIONAL ELECTRICAL CODE (2017 N.E.C.), INTERNATIONAL BLDG CODE 2015, LIFE SAFETY CODE (NFPA 101), TEXAS ACCESSIBILITY STANDARDS, AMERICANS WITH DISABILITIES ACT, OCCUPANCY CLASSIFICATION: R

26 05 00 BASIC ELECTRICAL REQUIREMENTS

PERMITS AND CODES: OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND REQUIRED INSPECTIONS. COMPLY WITH ALL NATIONAL, STATE AND MUNICIPAL LAWS, CODES AND ORDINANCES RELATING TO BUILDING AND PUBLIC SAFETY. PROVIDE ANY REQUIRED TEMPORARY POWER AND UTILITIES FOR ALL TRADES AND ALL CONSTRUCTION TRAILERS. PROVIDE TEMPORARY CONSTRUCTION LIGHTING AND POWER.

TRENCH SAFETY: SEE SUBCHAPTER C OF CHAPTER 756 OF THE TEXAS HEALTH AND SAFETY CODE FOR REQUIREMENTS APPLICABLE TO TRENCH SAFETY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ASSURE COMPLIANCE WITH APPLICABLE STATE AND FEDERAL LAWS, AND NO PROVISION OF THESE DRAWINGS OR SPECIFICATIONS SHALL BE DEEMED TO EXCUSE COMPLIANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS FOR TRENCH SAFETY.

VISITING THE JOB SITE: VISIT THE SITE OF THE PROPOSED CONSTRUCTION IN ORDER TO FULLY UNDERSTAND THE FACILITIES, DIFFICULTIES AND RESTRICTIONS ATTENDING THE EXECUTION OF THE WORK. NO ADDITIONAL COMPENSATION WILL BE ALLOWED THIS CONTRACTOR FOR WORK OR ITEMS OMITTED FROM HIS ORIGINAL PROPOSAL DUE TO HIS FAILURE TO INFORM HIMSELF REGARDING SUCH MATTERS AFFECTING THE PERFORMANCE OF THE WORK IN THIS CONTRACT OR NECESSARY FOR THE INSTALLATION AND COMPLETION OF THE WORK INCLUDED HEREIN.

DRAWINGS: DRAWINGS ARE DIAGRAMMATIC. CONFIRM DIMENSIONS & LOCATIONS IN THE FIELD. IF CONFLICTING DIMENSIONS ARE SHOWN, USE LARGER DIMENSIONS AND VERIFY WITH ARCHITECT. SEE ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATION OF FIXTURES AND WALL MOUNTED DEVICES.

MATERIAL: ALL MATERIALS SHALL BE NEW, MADE IN USA AND U.L. LISTED. MATERIAL INSTALLATION SHALL COMPLY WITH NEC REQUIREMENTS AND PERFORM BY CRAFTSMAN SKILLED IN THIS PARTICULAR WORK.

EQUIPMENT PROTECTION: PROTECT EQUIPMENT AND WORK FROM DAMAGE DURING HANDLING AND INSTALLATION UNTIL COMPLETION OF CONSTRUCTION.

COOPERATION WITH OTHER TRADES: COOPERATION WITH TRADES OF ADJACENT, RELATED OR AFFECTED MATERIALS OR OPERATIONS, AND WITH TRADES PERFORMING CONTINUATIONS OF THIS WORK UNDER SUBSEQUENT CONTRACTS, IS CONSIDERED A PART OF THIS WORK IN ORDER TO EFFECT TIMELY AND ACCURATE PLACING OF WORK AND TO BRING TOGETHER, IN PROPER AND CORRECT SEQUENCE, THE WORK OF SUCH TRADES. PROVIDE OTHER TRADES, AS REQUIRED, ALL NECESSARY TEMPLATES, PATTERNS, SETTING PLANS AND SHOP DETAILS FOR THE PROPER INSTALLATION OF THE WORK AND FOR THE PURPOSE OF COORDINATING ADJACENT WORK. ELECTRICAL POWER CONNECTIONS FOR MECHANICAL AND PLUMBING EQUIPMENT ARE IN THIS DIVISION UNLESS NOTED OTHERWISE. VERIFY CHARACTERISTICS OF ALL EQUIPMENT WITH DIVISION 15 AND OTHER SPECIAL DIVISIONS (ELEVATORS ETC.) BEFORE ROUGHING IN THE ELECTRICAL CONNECTIONS AND ENERGIZING THE EQUIPMENT. VERIFY ALL FITTINGS IN MECH/PLUMBING/SPECIAL ELEC ACCESS AND CLEARANCE AREAS: REMOVE ANY IMPROPERLY INSTALLED ELECTRICAL EPOXY AND CONDUIT THAT ARE LIMITING PROPER ACCESS FOR EOPt SERVICE AND MAINTENANCE.

ACCESS PANEL: PROVIDE ACCESS PANELS OR DOORS FOR ALL DEVICES REQUIRING ADJUSTMENT. SIMILARLY FOR ALL JUNCTION BOXES, PULL BOXES ETC THAT ARE REQUIRED TO BE ACCESSIBLE PER CODE AND/OR THE LOCAL AUTHORITY HAVING JURISDICTION. APPEARANCE OF ACCESS PANELS/DOORS SHALL BE ACCESSIBLE TO ARCHITECT. PANEL DOORS SHAL BE DESIGNED FOR THE FIRE RATING OF WALL OR CEILING IN WHICH THEY ARE INSTALLED. ALL ACCESS PANELS SHALL BE LOCKABLE AND SHALL BE KEYED ALIKE (SAME KEYING AS PANELS FROM OTHER DIVISIONS).

PENUMS: PENUMS ARE CROWDED AND NOT ALL OBSTACLES ARE INDICATED. ALLOW FOR CONDUIT OFFSETS AND PULL BOXES NOT INDICATED ON DRAWINGS.

PLASTER, GYPSUM BOARD OR OTHER NON-ACCESSIBLE CEILINGS: CONTRACTOR SHALL MINIMIZE CUTTING AND PATCHING BY INSTALLING CONDUIT PRIOR TO CEILING/WALL/PARTITION COVER-UP.

LOSS OR DAMAGE TO EXISTING FACILITIES

CONTRACTOR SHALL BE RESPONSIBLE FOR LOSS OR DAMAGE TO THE EXISTING FACILITIES CAUSED BY HIM AND HIS WORKMEN, AND SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING SUCH LOSS OR DAMAGE. THE CONTRACTOR SHALL SEND PROPER NOTICES, MAKE NECESSARY ARRANGEMENTS, AND PERFORM OTHER SERVICES REQUIRED FOR THE CARE, PROTECTION AND IN-SERVICE MAINTENANCE OF ALL ELECTRICAL SERVICE FACILITIES EXISTING AT FACILITIES. THE CONTRACTOR SHALL REMOVE ANY TEMPORARY BARRICADES, WITH NECESSARY SAFETY DEVICES, AS REQUIRED TO PROTECT PERSONNEL AND THE GENERAL PUBLIC FROM INJURY, REMOVING ALL SUCH TEMPORARY PROTECTION UPON COMPLETION OF THE WORK.

THE CONTRACTOR SHALL MODIFY, REMOVE AND/OR REPLACE ALL MATERIALS AND ITEMS SO INDICATED ON THE DRAWINGS OR REQUIRED BY THE INSTALLATION OF NEW FACILITIES. **SALVAGE MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE DELIVERED TO SUCH DESTINATION AS DIRECTED BY THE OWNER. DISPOSE OF SALVAGE MATERIAL IF NOT RETAINED BY OWNER.** WHERE EXISTING CONSTRUCTION IS REQUIRED TO PROVIDE WORKING AND EXTENSION ACCESS TO EXISTING UTILITIES, CONTRACTOR SHALL REMOVE CEILING GRID, TILES, DOORS, PIPING, AIR CONDITIONING DUCTWORK AND EQUIPMENT, ETC. TO PROVIDE THIS ACCESS AND SHALL REINSTALL SAME UPON COMPLETION OF WORK IN THE AREAS AFFECTED.

WORK IN OCCUPIED AREAS: WORK IN ABOVE, BELOW OR NEAR OCCUPIED AREAS SHALL BE AT OWNER'S CONVENIENCE AND MAY BE DURING EVENINGS OR WEEKENDS. SCHEDULE ALL REQUIRED POWER OUTAGES A MINIMUM OF 7 DAYS IN ADVANCE WITH FACILITY ENGINEER/OWNER. **DO NOT TURN OFF ANY POWER SOURCES. ONLY FACILITY ENGINEER/OWNER OR HIS AUTHORIZED REPRESENTATIVE MAY DO SO.**

ELECTRICAL SERVICE OUTAGE: SERVICE TO THE EXISTING BUILDING SHALL BE MAINTAINED DURING ALL HOURS. ANY SERVICE OUTAGE REQUIRED TO COMPLETE THE WORK SHALL BE AT THE TIME AND DATE THE LENGTH OF TIME AS DIRECTED BY THE OWNER. ALL PREMIUM TIME SHALL BE INCLUDED IN CONTRACTOR'S BID.

FIRE STOPS AND PENETRATION SEALS: ALL PENETRATIONS THROUGH FIRE RATED FLOORS AND WALLS SHALL BE SEALED WITH 3M FIRE RESISTANT FOAM SEALANT, TO PREVENT THE SPREAD OF SMOKE, FIRE, TOXIC GAS OR WATER THROUGH THE PENETRATION EITHER BEFORE, DURING OR AFTER A FIRE. THE FIRE RATING OF THE PENETRATION SEAL SHALL BE AT LEAST THAT OF THE FLOOR OR WALL INTO WHICH IT IS INSTALLED, SO THAT THE ORIGINAL FIRE RATING OF THE FLOOR OR WALL IS MAINTAINED AS REQUIRED BY ARTICLE 300.21 OF THE NATIONAL ELECTRICAL CODE.

CLEAN UP: A) PROVIDE FOR ISOLATION OF WORK AREAS AND DAILY REMOVAL OF DEBRIS. B) CLEAN ALL EQUIPMENT AND FIXTURE LENSES. C) REPLACE ALL BURNED OUT LAMPS. D) TOUCH UP WITH PAINT WHERE REQUIRED.

SUBMITTAL DATA: SUBMITTALS ARE REQUIRED BUT NOT LIMITED TO THE FOLLOWING EQUIPMENT: LIGHTING FIXTURES; SWITCHES ETC. EMERGENCY STANDBY GENERATOR SYSTEM, FIRE ALARM SYSTEM, SECURITY SYSTEM, COMMUNICATION SYSTEM; CONDUIT/FITTINGS; WIRES.

SHOP DRAWINGS: SHOP DRAWINGS AS REQUIRED SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. THESE SHOP DRAWINGS SHALL BE PREPARED TO INDICATE INSTALLATION OF MAJOR EQUIPMENT WHERE SPECIAL COORDINATION PROBLEM EXIST. OVERCURRENT & SAFETY DISCONNECT DEVICES FOR HVAC EOPt, OVERCURRENT (OO) & DISCONNECT DEVICES SHOWN ON DRAWINGS ARE BASED ON A SPECIFIC HVAC EQUIPMENT MANUFACTURER. HVAC CONTRACTOR MAY SUBMIT OTHER MANUFACTURERS, DIFFERENT MODELS OR RATINGS. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO COORDINATE OODISCONNECT DEVICES WITH THE HVAC CONTRACTOR PRIOR TO SUBMITTING SUCH DEVICES FOR ENGINEER'S REVIEW. ANY DEVIATIONS FROM SIZES SHOWN ON DRAWINGS MUST BE NOTED IN THE SUBMITTALS. THE ELECTRICAL CONTRACTOR MUST CERTIFY THAT HE HAS REVIEWED AND COORDINATED WITH THE HVAC CONTRACTOR AND THAT ALL OODISCONNECT DEVICES SUBMITTED MATCH THE HVAC EOPt REQUIREMENTS. SHOP DRAWINGS WITHOUT SUCH CERTIFICATION WILL BE RETURNED TO THE CONTRACTOR. ONLY SUBMITTALS WITH SUCH CERTIFICATION WILL BE REVIEWED.

COMPLETE SYSTEMS: ALL SYSTEMS SHALL BE COMPLETE AND WORKING AT COMPLETION OF CONSTRUCTION.

FINAL INSPECTION & OPERATING TESTS: ALL ELECTRICAL SYSTEMS MUST BE CHECKED FOR PROPER POLARITY AND SEQUENCE. ALL MOTORS MUST BE CHECKED FOR PROPER ROTATION AND ALL EQUIPMENT (INCLUDING HVAC, ELEVATOR AND SPECIAL EQUIPMENT) MUST BE CHECKED FOR PROPER PHASING AND REQUIREMENTS. PRIOR TO THE APPLICATION OF ANY POWER, THE CONTRACTOR MUST CERTIFY THAT ALL CONNECTED EQUIPMENT MATCH THE CHARACTERISTICS OF THE SUPPLY CIRCUIT VOLTAGE, PHASING AND FEEDER REQUIREMENTS.

AT THE TIME DESIGNATED BY THE ARCHITECT, THE ENTIRE SYSTEM SHALL BE INSPECTED BY THE ARCHITECT AND THE ENGINEER. THE CONTRACTOR OR HIS REPRESENTATIVE SHALL BE PRESENT AT THIS INSPECTION. AFTER ALL SYSTEMS HAVE BEEN COMPLETED AND PUT INTO OPERATION, SUBJECT EACH SYSTEM TO AN OPERATING TEST UNDER DESIGN CONDITIONS TO ENSURE PROPER SEQUENCE AND OPERATION THROUGHOUT THE RANGE OF OPERATION. MAKE ADJUSTMENTS AS REQUIRED TO ENSURE PROPER FUNCTIONING OF ALL SYSTEMS. SPECIAL TESTS ON INDIVIDUAL SYSTEMS ARE SPECIFIED UNDER INDIVIDUAL SECTIONS.

THE CONTRACTOR SHALL PROVIDE A SET OF AS-BUILT DRAWINGS TO THE OWNER. 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.

1 **GUARANTEE:** GUARANTEE ALL WORK AND MATERIALS FURNISHED UNDER THIS CONTRACT FOR A PERIOD OF TWO YEARS FROM THE DATE OF ACCEPTANCE BY THE OWNER AND ARCHITECT. GUARANTEE SHALL INCLUDE: ALL LABOR, PARTS, TRAVEL/SUBSISTENCE, SOFTWARE CHANGES/RE-PROGRAMMING, ETC.

RECORD DRAWINGS: MAINTAIN A CONTINUOUS DAILY RECORD DURING THE COURSE OF CONSTRUCTION OF ALL CHANGES AND DEVIATIONS IN THE WORK FROM THE ACCOMPANYING DRAWINGS. SHOW EXACT INTERNATIONAL BLDG CODE 2015, LIFE SAFETY CODE (NFPA 101), TEXAS ACCESSIBILITY STANDARDS, AMERICANS WITH DISABILITIES ACT, OCCUPANCY CLASSIFICATION: R

26 05 73 SHORT CIRCUIT CALCULATION, PROTECTIVE DEVICE COORDINATION AND ARC FLASH STUDIES: PROVIDE SHORT CIRCUIT CALCULATION, PROTECTIVE DEVICE COORDINATION AND ARC FLASH HAZARD STUDIES. STUDIES SHALL ENCOMPASS ELECTRICAL DISTRIBUTION SYSTEM FROM NORMAL POWER SOURCE OR SOURCE TO EACH PANEL BOARD. PREPARE STUDY PRIOR TO ORDERING DISTRIBUTION EQUIPMENT TO VERIFY EQUIPMENT RATINGS REQUIRED. PERFORM STUDY WITH AID OF COMPUTER SOFTWARE PROGRAMS. REPORT SHALL INCLUDE: (A) CALCULATION METHODS AND ASSUMPTIONS, (B) ONE LINE DIAGRAM, (C) STATE CONCLUSIONS AND RECOMMENDATIONS. ARC FLASH HAZARD ANALYSIS SHALL NOT BE REQUIRED FOR EQUIPMENT RATED 240 VOLTS OR LESS AND SUPPLIED BY ONE TRANSFORMER RATED LESS THAN 125 KVA. CONTRACTOR SHALL PROVIDE WARNING LABELS ON ELECTRICAL EQUIPMENT INDICATING INCIDENT ENERGY LEVEL, LEVEL OF HAZARD AND THE REQUIRED PERSONAL PROTECTION EQUIPMENT. EQUIPMENT SHALL INCLUDE, BUT NOT LIMITED TO: SWITCHBOARDS, DISTRIBUTION PANELS, MOTOR CONTROL CENTERS, PANELS, CONTACTORS, DISCONNECT SWITCHES AND MOTOR STARTERS.

26 05 33 CONDUIT AND BOXES: CONDUIT SHALL BE RIGID GALVANIZED STEEL (RGS) OR ELECTRICAL METALLIC TUBING (EMT) AS MANUFACTURED BY ALLIED, TRIANGLE OR WHEATLAND.

- INDOORS ABOVE GRADE: EMT OR RGS.
- OUTDOORS ABOVE GRADE, STUBUPS, OR ON ROOF: RGS OR IMC.
- BELOW GRADE: SCHEDULE 40 OR 80 PVC OR RGS. PROVIDE TRANSITION FITTINGS FROM PVC SCH 40 OR 80 TO RGS FOR ALL ABOVE GRADE CONDUIT. ALL UNDERGROUND METALLIC CONDUIT SHALL HAVE 40-MIL THICK EXTERNAL PVC COATING FOR CORROSION PROTECTION. UNDERGROUND CONDUIT MINIMUM SIZE 3/4" MINIMUM BURIAL DEPTH FROM FINISHED GRADE TO TOP OF CONDUIT. PROVIDE DEEPER BURIAL DEPTH IF REQUIRED BY LOCAL CODES. PROVIDE CONCRETE ENCASUREMENT FOR ALL INCOMING SERVICE CONDUIT UNLESS SPECIFICALLY NOTED OTHERWISE. PROVIDE RED DETECTABLE WARNING TAPE OVER ENTIRE RUN OF SERVICE AND MAJOR CONDUIT RUNS.
- UNDER SLAB, RGS OR SCHEDULE 80 PVC.

INSTALL GROUND WIRES WHERE SHOWN ON THE DRAWINGS. COMPRESSION OR SET-SCREW TYPE FITTINGS MAY BE USED FOR EMT. MINIMUM CONDUIT SIZE 3/4 INCH, EXCEPT THAT DROPS TO SWITCHES MAY BE 1/2". FIELD JOINTS SHALL BE MADE AT THE FOLLOWING EQUIPMENT: MOTORS, LIGHTING FIXTURES, HEATER, POWER SUPPLIES, AND ANY OTHER VIBRATION PRODUCING EQUIPMENT. UTILIZE 1/2" FLEXIBLE METALLIC CONDUIT MINIMUM AND INCLUDE A GREEN GROUND WIRE. USE SEALTITE IN WET LOCATIONS SUCH AS OUTDOOR CONDENSING UNITS, WALK-IN COOLER/FREEZER, KITCHEN, ROOF HVAC EOPt ETC. CONDUIT SHALL BE SUPPORTED FROM STRUCTURE EVERY 5 FEET AND WITHIN 3 FEET OF ALL BOXES. USE LOCKNUTS INSIDE AND OUT AT BOXES. MAINTAIN MINIMUM 1/2" SEPARATION FROM ALL HIGH TEMPERATURE PIPES. ALL CONDUIT RUNS SHALL BE INSTALLED EITHER PARALLEL OR PERPENDICULAR TO BUILDING LINES. ROUTE CONDUIT AS DIRECTLY AS POSSIBLE WITH LARGEST RADIUS BENDS POSSIBLE. MAKE BENDS WITH STEEL BENDS PER U.L. LISTED. PROVIDE FITTINGS IF CONDUIT CROSSES STRUCTURAL EXPANSION JOINT. ALL CONDUIT ON ROOF SHALL BE SUPPORTED BY AN ENGINEER. PREFABRICATED PORTABLE PIPE SYSTEM SPECIFICALLY DESIGNED TO BE INSTALLED ON THE ROOF WITHIN 30 DAYS AFTER THE ROOF IS COMPLETE. PROVIDE SUPPORT AT THE POINTS OF FAILURE TO INTERIOR OUTLET TO EXCEED 10' ON CENTER, AND WITHIN 5' OF ANY DEFLECTION OF CONDUIT. CLEAN CONDUIT BEFORE INSTALLATION. COAT SCRATCHES WITH ZINC PAINT. PROVIDE PULL WIRE IN ALL CONDUIT (POWER, FIRE ALARM, TELEPHONE AND OTHER COMMUNICATION CONDUIT). **PULL WIRE ALSO REQUIRED IN ALL SPARE CONDUIT.**

PROJECT RECORD DOCUMENTS: ACCURATELY RECORD ACTUAL ROUTING OF ALL UNDERSLAB AND UNDERGROUND CONDUITS; INCLUDE DIMENSIONS FROM KEY BUILDING POINTS AND DEPTH OF COVER.

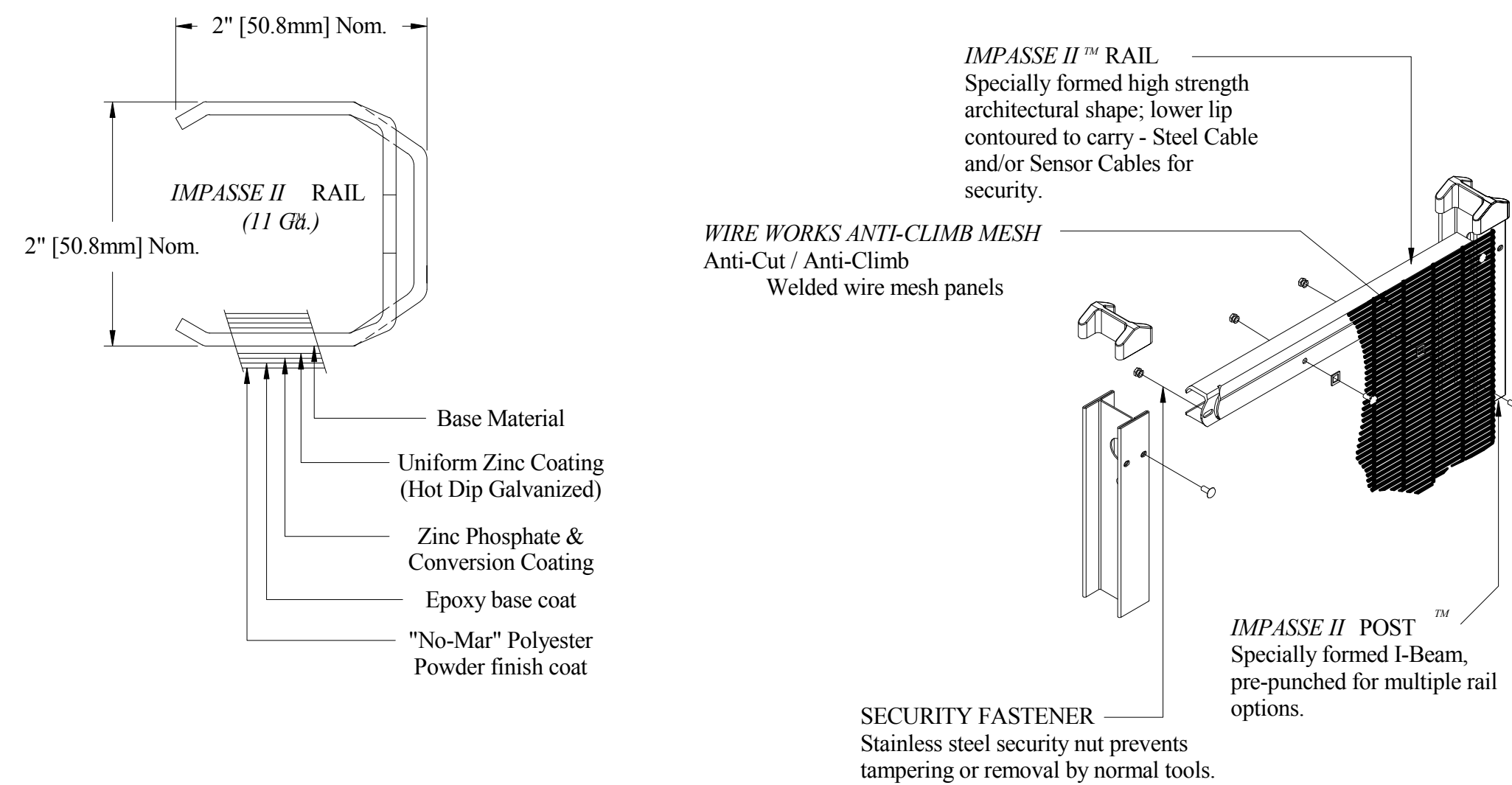
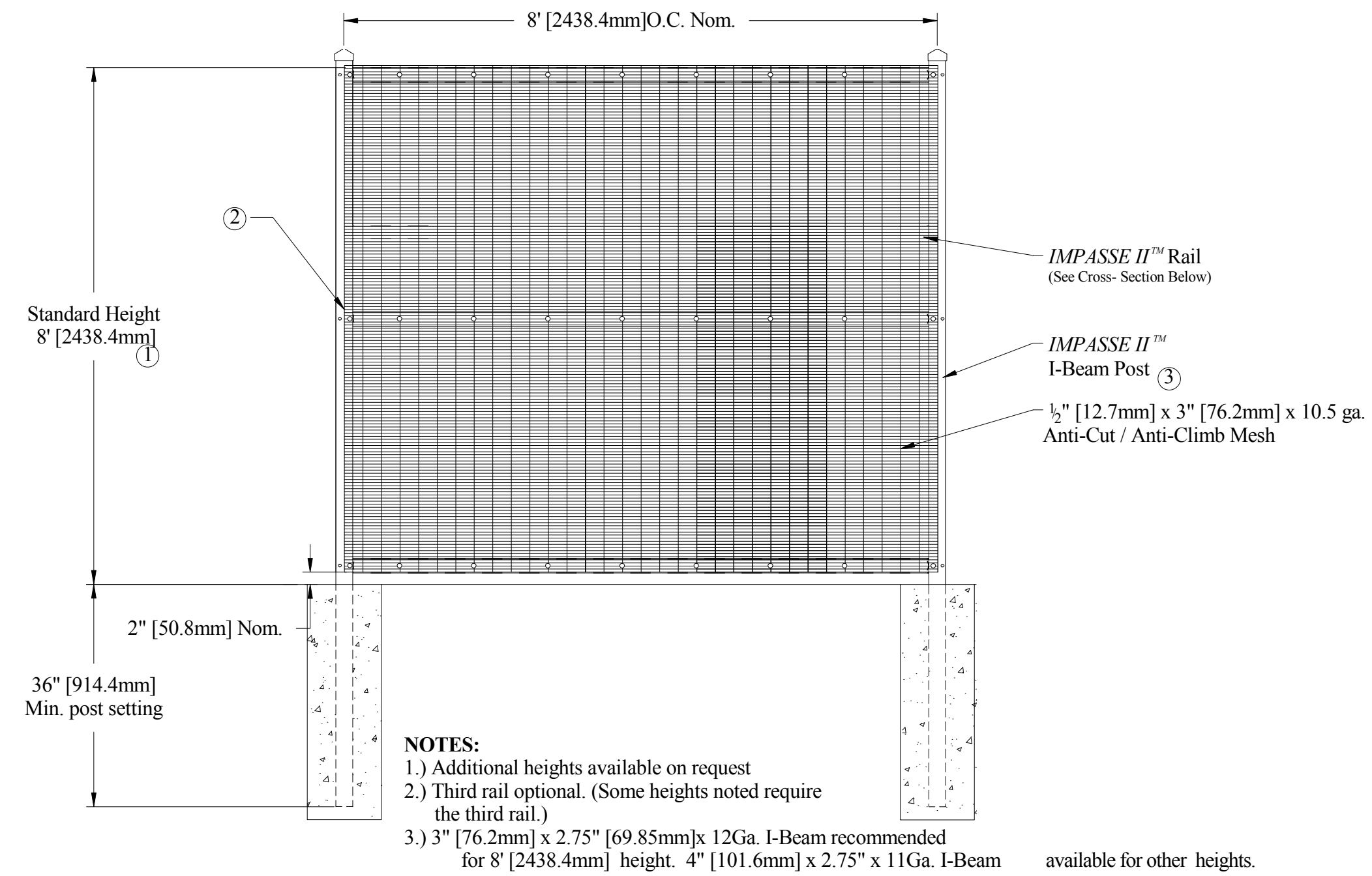
OUTLET BOXES: SHALL BE GALVANIZED STEEL SUITABLE FOR LOCATION. CEILING OUTLET BOXES SHALL BE 4" OCTAGON. WALL OUTLET BOXES SHALL BE PROPER DESIGN TO ACCOMMODATE THE DEVICES REQUIRED - 4 INCH SQUARE WITH RAISED COVER. PROVIDE RACO, STEEL CITY OR APPLICON. ALL J-BOXES / SPLICE BOXES MUST BE ACCESSIBLE.

JUNCTION PULL BOXES: (A) FOR EACH CONDUIT RUN: PROVIDE ONE JUNCTION/PULL BOX FOR EACH CONDUIT. (B) PROVIDE ONE JUNCTION/PULL BOX FOR EACH UNDERGROUND FEEDER; MINIMUM ONE PULL BOX FOR EACH 350 FEET OF CONDUIT RUN.

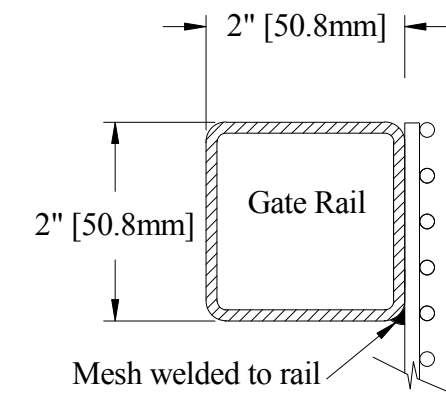
26 05 19 BUILDING WIRE AND CABLE WIRE: (TRIANGLE, AMERICAN INSULATED CABLE CO., OR CABLEC) **ALL WIRING SHALL BE IN CONDUIT (EXCEPT PENUM RATED LOW VOLTAGE CABLES). ALL WIRES MUST BE 75-DEGREE C RATED OR BETTER, 60-DEGREE C RATED WIRE SHALL NOT BE USED, 90-DEGREE C RATED WIRE SHALL BE USED ONLY FOR EMERGENCY AND NORMAL CIRCUITS MUST BE INSTALLED IN SEPARATE CONDUIT AND DEVICE BOXES PER N.E.C. ARTICLE 700.9(B).**

- MINIMUM SIZE #12 EXCEPT CONTROLS MAY BE #14. USE #10 CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 100 FEET. USE #10 CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 200 FEET.
- TYPE THHN/THWN STRANDED COPPER THERMOPLASTIC IN DRY LOCATIONS.
- TYPE THHN IN WET LOCATIONS (OUTDOOR, UNDERGROUND, ON ROOF, ETC.).
- ALL WIRE SHALL BE 98% CONDUCTIVITY COPPER, 600 VOLT, NO ALUMINUM WIRES.
- WIRE SHALL BE PROPERLY SUPPORTED BY BRIDAL, RINGS, CABLE TIES, CLIPS ETC MADE BY ERICO COMMUNICATION WIRE (FIRE ALARM, TELEPHONE, HVAC THERMOSTAT, DATA ETC.); PENUM RATED LOW-SMOKE CABLE MAY BE USED IN LIEU OF WIRE/CONDUIT TYPE INSTALLATION. ALL PENUM RATED CABLE SHALL BE PROPERLY SUPPORTED BY BRIDAL, RINGS, CABLE TIES, CLIPS ETC MADE BY ERICO COMMUNICATION WIRE (FIRE ALARM, TELEPHONE, HVAC THERMOSTAT, DATA ETC.); PENUM RATED LOW-SMOKE CABLE MAY BE USED IN LIEU OF WIRE/CONDUIT TYPE INSTALLATION. ALL PENUM RATED CABLE SHALL BE PROPERLY SUPPORTED BY BRIDAL, RINGS, CABLE TIES, CLIPS ETC MADE BY ERICO COMMUNICATION WIRE (FIRE ALARM, TELEPHONE, HVAC THERMOSTAT, DATA ETC.); PENUM RATED LOW-SMOKE CABLE MAY BE USED IN LIEU OF WIRE/CONDUIT TYPE INSTALLATION. 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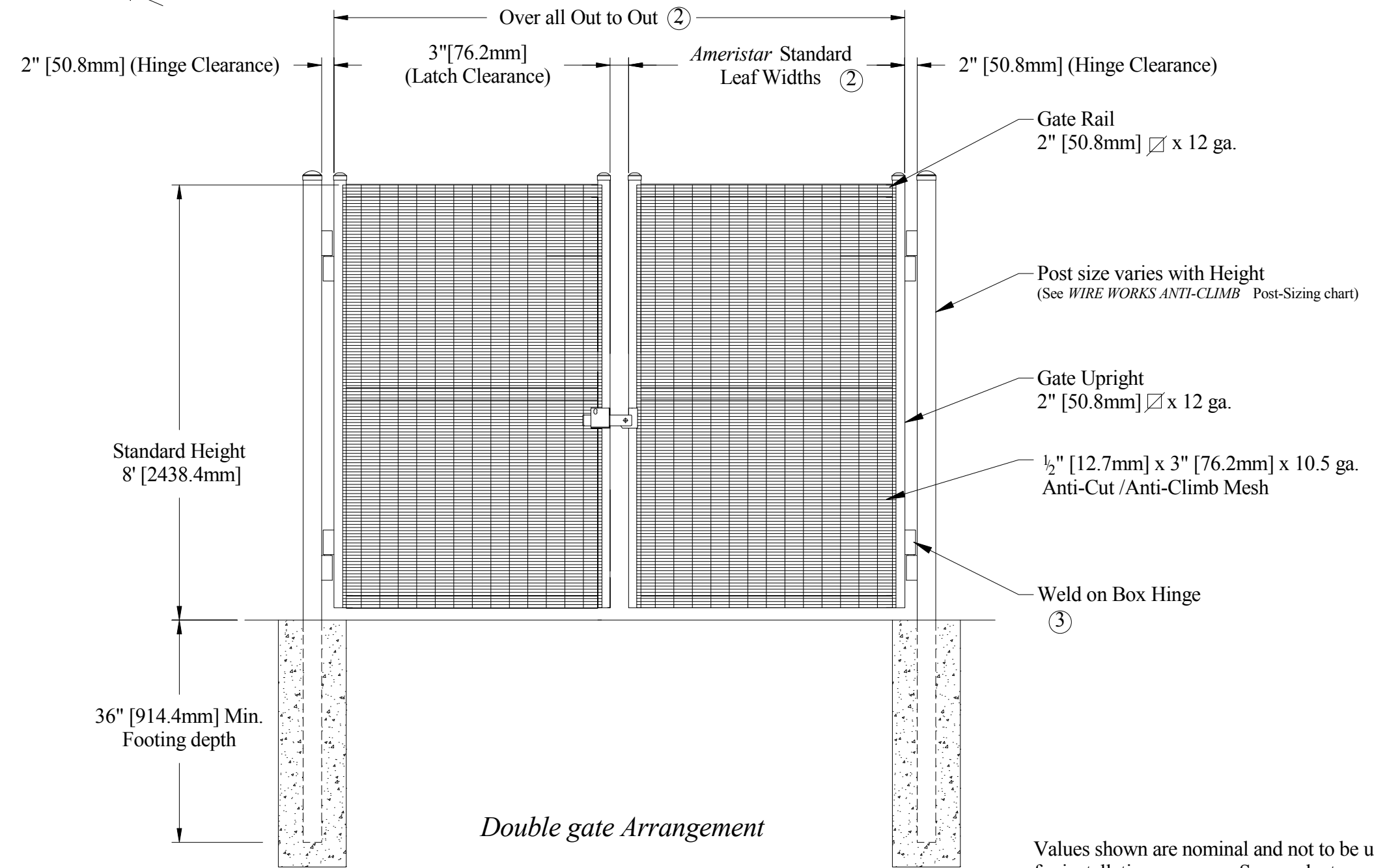
Values shown are nominal and not to be used for installation purposes. See product specification for installation requirements.



AMERISTAR- WIREWORKS ANTI-CLIMB PANELS



- NOTES:
 1.) Post size depends on fence height, weight and wind loads. See *Wire Works Anti-Climb* post sizing chart.
 2.) See *Ameristar* gate table for standard out to outs. Custom gate openings available for special out to out/leaf widths.
 3.) Additional styles of gate hardware are available on request. This could change the Latch & Hinge Clearance.
 4.) Third rail optional. (Some heights noted require the third rail.)



AMERISTAR- WIREWORKS ANTICLIMB DOUBLE GATE

FOR INFORMATION PURPOSES ONLY.
 COORDINATE WITH AMERISTAR REP
 FOR FULL INSTALLATION GUIDE AND
 PRICING.

No.	Description	Date
	ISSUE FOR PERMIT	05/24/18
	ISSUE FOR BID	08/17/18

FAIR AVENUE APARTMENTS SPRINKLER DESIGN

SAN ANTONIO HOUSING AUTHORITY
 1215 FAIR AVENUE
 SAN ANTONIO, TEXAS

ENGINEERS
 PLANNERS
 SCIENTISTS
KCI
 CONSTRUCTION MANAGERS
 13750 SAN PEDRO AVE. STE. 640
 SAN ANTONIO, TX 78223
 Ph: (210) 544-5751
 Texas Registered Engineering Firm F-10573

08-15-18

PROJECT NUMBER	7917053.00
DRAWN BY	DHL
CHECKED BY	CLC
SHEET DATE	08/17/18
FENCE AND GATE DETAILS	

ME.400

STRUCTURAL NOTES

1. BUILDING CODES

- A. THE 2012 INTERNATIONAL BUILDING CODE (IBC) AND ALL SUBSEQUENT SUPPLEMENTS
- B. GOVERNING LOCAL BUILDING CODE

2. DESIGN LOADS

A. FOUNDATION IS DESIGNED TO SUPPORT THE FOLLOWING LOADS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS FOR POWER GENERATION GENERATOR 500DFEK 250-1000KW.

GENERATOR	LIVE LOAD	DEAD LOAD
--	7299 LB	

B. ROOF SNOW LOAD DESIGN CRITERIA:

GROUND SNOW LOAD (Pg):	5 PSF
FLAT ROOF SNOW LOAD (Pf):	4.2 PSF
EXPOSURE FACTOR (Ce):	1.0
IMPORTANCE FACTOR (I):	1.0
THERMAL FACTOR (Ct):	1.2

C. WIND LOAD DESIGN CRITERIA:

BASIC WIND SPEED	110 MPH
WIND EXPOSURE	C
IMPORTANCE FACTOR (I):	1.0

D. EARTHQUAKE LOAD DESIGN CRITERIA:

EQUIVALENT LATERAL FORCE PROCEDURE:
SEISMIC DESIGN CATEGORY: B

IMPORTANCE FACTOR (I): 1.0
MAPPED SPECTRAL RESPONSE ACCELERATIONS (Ss)=0.08
(S1)=0.04

SPECTRAL RESPONSE COEFFICIENTS (SDS)=0.085
(SD1)=0.064

SOIL SITE CLASS: D (ASSUMED)
RESPONSE MODIFICATION FACTOR (R): 1.5
SEISMIC RESISTING SYSTEM: GROUND SUPPORTED MECHANICALLY ANCHORED GENERATOR
DESIGN BASE SHEAR (V): 0.227 KIP

E. THE CONTRACTOR SHALL NOT STORE ANY CONSTRUCTION MATERIALS OR UNDERTAKE ANY CONSTRUCTION OPERATION WHICH WILL EXCEED THE DESIGN LIVE LOADINGS NOTED.

3. SPREAD FOOTING FOUNDATIONS

A. REFER TO "CAST IN PLACE CONCRETE" FOR APPLICABLE CODES AND STANDARDS.

B. ASSUMED PARAMETERS FOR SPREAD FOOTING DESIGN ARE AS FOLLOWS:

- 1. MINIMUM DEPTH TO BOTTOM OF EXTERIOR FOOTING FOR FROST PROTECTION = 5 IN BELOW GRADE
- 2. ASSUMED NET ALLOWABLE BEARING CAPACITY = 2000 PSF

C. THE ALLOWABLE SOIL BEARING PRESSURE SHALL BE FIELD VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER AND APPROVED PRIOR TO PLACING FOUNDATIONS. SHOULD THE ACTUAL SOIL BEARING PRESSURE BE LESS THAN 2000 PSF, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER.

D. ALL EXCAVATION AND BACKFILLING OPERATIONS WITHIN THE BUILDING FOOTPRINT, INCLUDING ALL CONPACTION TESTS AND INSPECTIONS, SHALL BE DONE UNDER THE DIRECTION AND SUPERVISION OF A REGISTERED GEOTECHNICAL ENGINEER.

E. ALL EXISTING SOIL CONTAINING GRAVEL, CONSTRUCTION OR DEMOLITION DEBRIS, ORGANIC SUBSTANCES, OR OTHER FOREIGN OBJECTS SHALL BE REMOVED FROM THE REGION WITHIN THE FOOTPRINT OF THE STRUCTURE.

4. CAST IN PLACE CONCRETE

A. CODES AND STANDARDS:

- 1. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"
- 2. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
- 3. ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS"
- 4. ACI 305 "RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING"
- 5. ACI 308 "RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING"
- 6. ACI 347 "RECOMMENDED PRACTICE FOR CONCRETE FROM WORK"
- 7. ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
- 8. CRSI "MANUAL OF STANDARD PRACTICE"

B. REINFORCING MATERIALS:

- 1. STEEL REINFORCEMENT: ASTM A 615, GRADE 60, DEFORMED
- 2. PLAIN-STEEL WELDED WIRE REINFORCEMENT: ASTM A 185

C. CONCRETE MATERIALS:

- 1. PORTLAND CEMENT: ASTM C 150, TYPE III
- 2. FLY ASH: ASTM C 618, CLASS F
- 3. GROUND GRANULATED BLAST FURNACE SLAG: ASTM C 989, GRADE 120
- 4. NORMAL WEIGHT AGGREGATES: ASTM C 33
- a. MAXIMUM COARSE AGGREGATE SIZE: 1 INCH NOMINAL
- b. FINE AGGREGATE SHALL BE FREE OF MATERIAL WITH DELETERIOUS REACTIVITY TO ALKALI IN CEMENT.
- 5. WATER: ASTM C 94, POTABLE

D. ADMIXTURES:

- 1. AIR ENTRAINMENT: ASTM C 260
- 2. WATER-REDUCER: ASTM C 494
- 3. SILICA FUME: ASTM C 1240
- 4. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL BE PERMITTED.

E. CONCRETE MIXTURES:

- 1. FLY ASH, POZZOLAN, GROUND GRANULATED BLAST FURNACE SLAG, AND SILICA FUME MAY BE USED AS NEEDED TO REDUCE THE TOTAL AMOUNT OF PORTLAND CEMENT WHICH WOULD OTHERWISE BE USED BY NOT MORE THAN 40 PERCENT.
- a. MAXIMUM SUBSTITUTION OF FLY ASH SHALL BE 20 PERCENT.
- b. MAXIMUM SUBSTITUTION OF SILICA FUME SHALL BE 10 PERCENT.

F. PROPORTION NORMAL WEIGHT CONCRETE MIXES AS FOLLOWS:

LOCATION	28 DAY STRENGTH (fc)	WATER-CEMENTIOUS RATIO	SLUMP	AIR LIMIT	CONTENT
FOUNDATIONS, WALLS BELOW GRADE	3000 PSI	0.60	4"+/-1"	6.0%+/-1.5%	
SLABS ON GRADE	3000 PSI	0.60	4"+/-1"	6.0%+/-1.5%	

G. ALL CONCRETE MIX DESIGNS, INCLUDING CEMENT CONTENT, WATER CEMENT RATIO, FINE AND COARSE AGGREGATE CONTENT AND ALL ADMIXTURES, SHALL BE REVIEWED BY ENGINEER PRIOR TO PLACING FIRST CONCRETE.

H. ALL CONCRETE SHALL BE SAMPLED AND TESTED BY THE TESTING AGENCY. THE CONTRACTOR SHALL NOTIFY THE TESTING AGENCY 48 HOURS PRIOR TO THE PLACING OF ANY CONCRETE.

I. MINIMUM COVER FOR ALL REINFORCING SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED:

FOUNDATIONS	3 INCHES
SLABS ON GRADE	2 INCHES (TOP)

5. MISCELLANEOUS

A. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THIS AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.

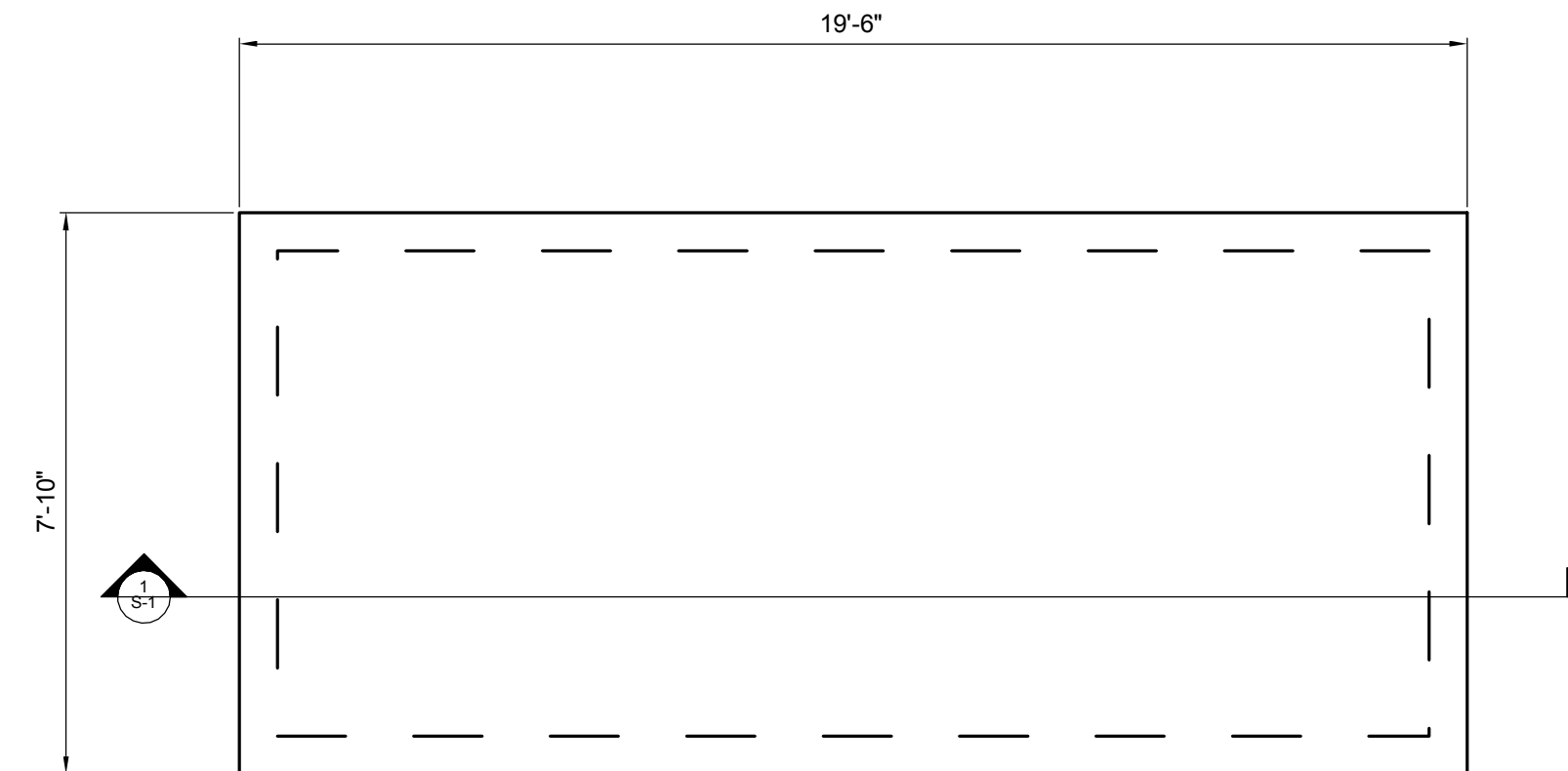
B. SHOP DRAWINGS FOR ALL STRUCTURAL ELEMENTS SHOWN ON THE CONTRACT DOCUMENTS MUST BE SUBMITTED BY THE CONTRACTOR OR OWNER FOR REVIEW BY THE ENGINEER. IF THE CONTRACTOR OR OWNER FAILS TO SUBMIT THE SHOP DRAWINGS, THE ENGINEER WILL NOT BE RESPONSIBLE FOR STRUCTURAL CERTIFICATION AND DESIGN OF THE PROJECT. THE SHOP DRAWINGS SHALL INDICATE ANY DEVIATIONS OR OMISSIONS FROM THE CONTRACT DOCUMENTS. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMISSION AND MAKE ALL CORRECTIONS DEEMED NECESSARY.

C. THE CONTRACTOR SHALL REVIEW THE CIVIL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATION AND DIMENSIONS OF CHASES, INTERS, OPENINGS, SLEEVES, DEPRESSIONS AND OTHER PROJECT REQUIREMENTS WHICH IMPACT THE STRUCTURAL COMPONENTS.

D. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH CONSTRUCTION.

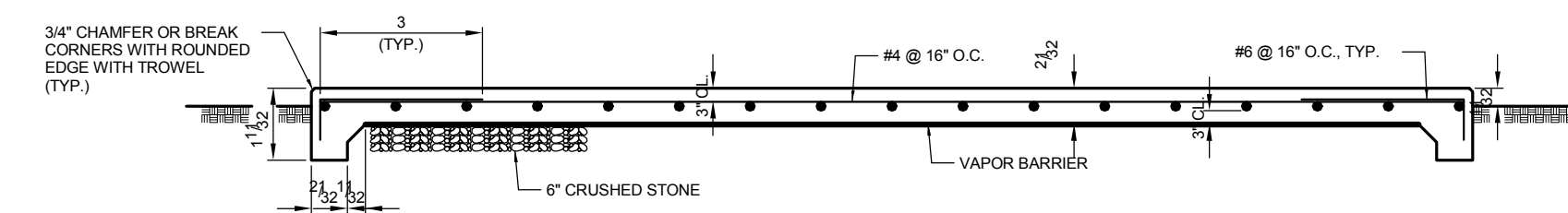
E. THE CONTRACTOR SHALL NOT SUBMIT REPRODUCTIONS OF THE STRUCTURAL CONTRACT DOCUMENTS AS SHOP DRAWINGS.

F. SCALES SHOWN ON THE STRUCTURAL CONTRACT DRAWINGS ARE FOR GENERAL INFORMATION ONLY. DIMENSIONAL INFORMATION SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.



FOUNDATION PLAN
(N.T.S.)

NOTES:
1. SEE GENERATOR MANUFACTURER FOR ANCHORING REQUIREMENTS.
2. COORDINATE WITH ELECTRICAL UTILITIES.
3. VERIFY PAD SIZE WITH EQUIPMENT SIZE BEFORE POURING CONCRETE PAD.



FOUNDATION SECTION
(N.T.S.)

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08-15-18

PROJECT NUMBER
7917053.00

DRAWN BY
Designer

CHECKED BY
Checker

SHEET DATE
08/17/18

GENERATOR PAD DETAILS

ME.401















HAZARDOUS MATERIALS: VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

PLUMBING SYMBOLS & ABBREVIATIONS

ABBREVIATIONS

CW	DOMESTIC COLD WATER LINE	
HW	DOMESTIC HOT WATER LINE	
HWR	DOMESTIC HOT WATER RECIRC LINE	
SAN	SANITARY DRAIN LINE	
V	SANITARY VENT LINE	
GW	GREASE WASTE DRAIN LINE	
GV	GREASE VENT LINE	
ST	STORM DRAIN LINE	
OD	OVER FLOW DRAIN LINE	
G	NATURAL GAS LINE	
A	COMPRESSED AIR LINE	
(N)	NEW	———— NEW
(E)	EXISTING	———— EXISTING
(D)	DEMO'D	----- DEMO'D
B.F.F.	BELOW FINISHED FLOOR	
A.F.F.	ABOVE FINISHED FLOOR	
WCO	WALL CLEAN OUT	
FCO	FLOOR CLEAN OUT	
COTG	CLEAN OUT TO GRADE	
N.I.C.	NOT IN CONTRACT	
B.O.P.	BOTTOM OF PIPE	
I.E.	INVERT ELEVATION	
HB	HOSE BIB	
VTR	VENT THRU ROOF	

SYMBOLS

	PIPE DOWN		BALL VALVE
	PIPE UP		BUTTERFLY VALVE
	FCO / COTG		GATE VALVE
	END OF LINE CLEANOUT		GLOBE VALVE
	END CAP		CHECK VALVE
	POINT OF CONNECTION		POINT OF DEMOLITION
	KEYED NOTES		
	RISER DESIGNATION		

UNLESS NOTED OTHERWISE, WATER AND VENT PIPING SHOWN ON PLANS ABOVE THE CEILING AND SANITARY DRAIN PIPING IS BELOW THE FLOOR

PLUMBING GENERAL NOTES (apply to all sheets)

- A. Drawings are diagrammatic; confirm dimensions and locations in the field. If conflicting dimensions are shown, use larger dimension.
- B. Contractor shall field verify size, location, and condition of existing piping before proceeding with bid and construction. Any reused piping found to be in poor condition or not per current code requirements shall be documented and the engineer shall be made aware of this condition immediately.
- C. All plumbing piping, equipment, and fixture installations shall be performed by a licensed plumbing contractor. All plumbing work shall be supervised by a licensed Master Plumber.
- D. Guarantee labor and materials for 1-year. Warranties begin upon Owner's acceptance of substantial completion of the installation.
- E. All plumbing materials, installation, testing, cleaning, supports, and workmanship shall be in strict accordance with the below listed applicable codes:
 - 1. 2015 International Plumbing Code with City of San Antonio Amendments
 - 2. 2015 IECC
 - 3. 2015 International Fire Code
- F. All exceptions or substitutions taken to specified materials, fixtures, equipment, or requirements of these documents shall be submitted to the owner, Architect, and Engineer for review prior to purchase and installation.
- G. Refer to project contract documentation and architectural drawings for additional requirements and information.
- H. Plenums are crowded and not all obstacles are indicated. Allow for additional pipe offsets, as required, and when not indicated on drawings.
- I. Properly seal all penetrations of floors, exterior walls, and rated walls.
- J. Secure all permits and provide any required temporary utilities.
- K. All work in or above occupied areas shall be at Owner's convenience and may be during evenings or weekends. Schedule all service interruptions in advance with Owner.
- L. Location of existing underslab plumbing is estimated – allow for exploratory chipping to confirm actual locations.
- M. Contractor shall visit site prior to bid – no extras will be allowed for conditions that could be readily observed.
- N. Piping shall not be routed over electrical panels or transformers.

FAIR AVENUE APARTMENTS SPRINKLER DESIGN

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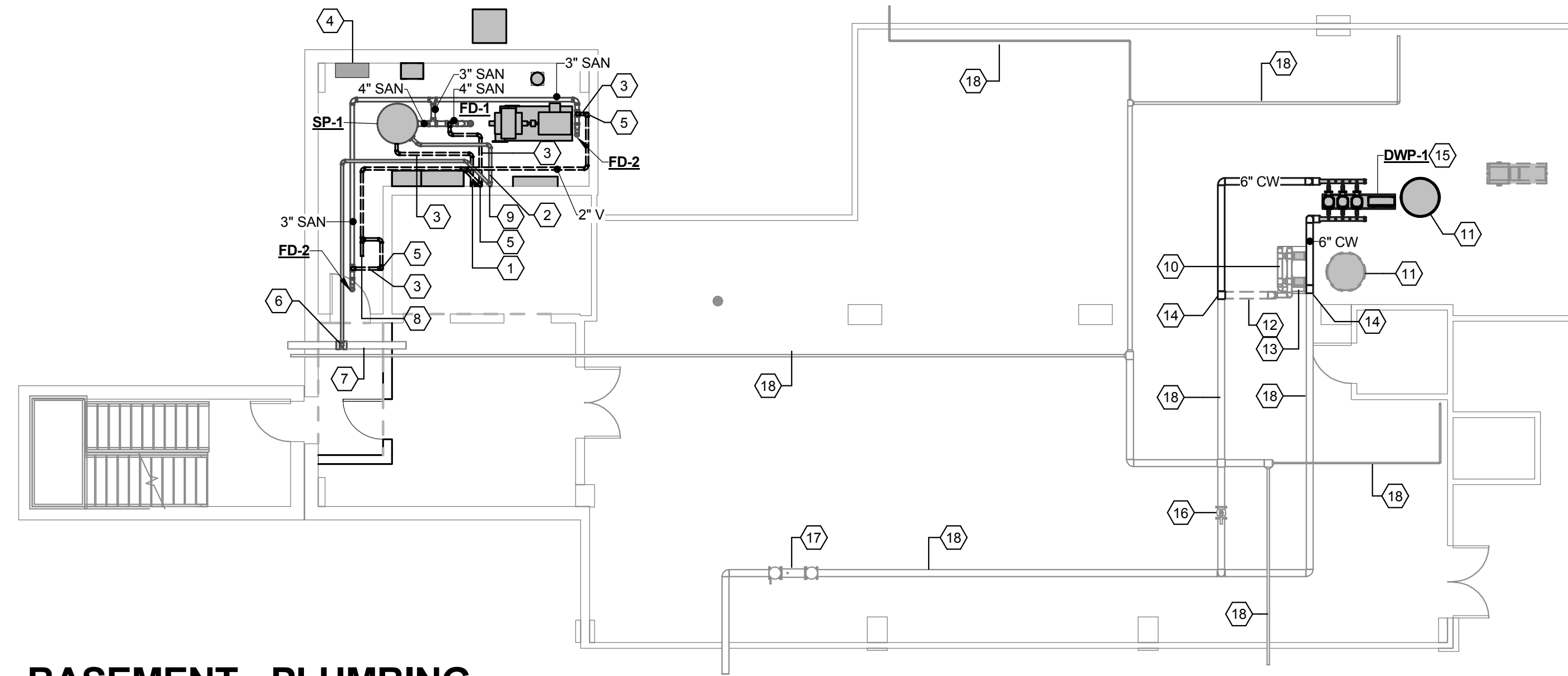
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PLUMBING GENERAL NOTES

P.000

08-15-18



1 BASEMENT - PLUMBING

1/8" = 1'-0"

NOTE: REPLACE EXISTING WELDED PIPE IN BASEMENT. REFER TO SPECS FOR PIPE MATERIALS AND FITTINGS.

KEYED NOTES

- 1 2"V FROM BELOW FLOOR.
- 2 2" PUMPED SAN BELOW FLOOR.
- 3 2"V BELOW FLOOR.
- 4 SUMP PUMP CONTROL PANEL.
- 5 2"V FROM BELOW FLOOR AND UP.
- 6 CONNECT NEW 2" SAN TO EXISTING IN THE AREA.
- 7 EXISTING 6" SAN TO REMAIN.
- 8 CONNECT NEW 2"V TO EXISTING IN THE AREA.
- 9 2" SAN FROM BELOW FLOOR AND UP.
- 10 EXISTING DOMESTIC WATER PUMP TO BE REMOVED. PUMP TO REMAIN IN SERVICE UNTIL NEW DWP-1 IS INSTALLED AND FULLY FUNCTIONAL. REMOVE EXISTING HOUSE KEEPING PAD AND REPAIR SLAB TO MATCH EXISTING.
- 11 NEW 80 GALLON ASME 150 PSI RATED BLADDER TANK. COORDINATE FINAL LOCATION WITH MANUFACTURE REQUIREMENTS AND BUILDING OWNER.
- 12 ONCE DWP-1 IS INSTALLED AND FULLY FUCTIONAL WATER FROM EXISTING DOMESTIC WATER PUMP IS TO BE CAPPED.
- 13 ONCE DWP-1 IS INSTALLED AND FULLY FUNCTIONAL WATER TO EXISTING DOMESTIC WATER PUMP IS TO BE CAPPED.
- 14 CONNECT NEW 6"CW TO EXISTING IN THE AREA.
- 15 NEW TRIPLEX DOMESTIC WATER PUMP. CONNECT TO EXISTING PIPING AS SHOWN.
- 16 EXISTING BYPASS TO REMAIN. EXISTING BYPASS VALVE TO BE REPLACED WITH NEW SELF-BALANCING VALVE.
- 17 EXISTING BACKFLOW PREVENTER TO REMAIN.
- 18 EXISTING WATER PIPING TO REMAIN.

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PLUMBING PLAN - BASEMENT

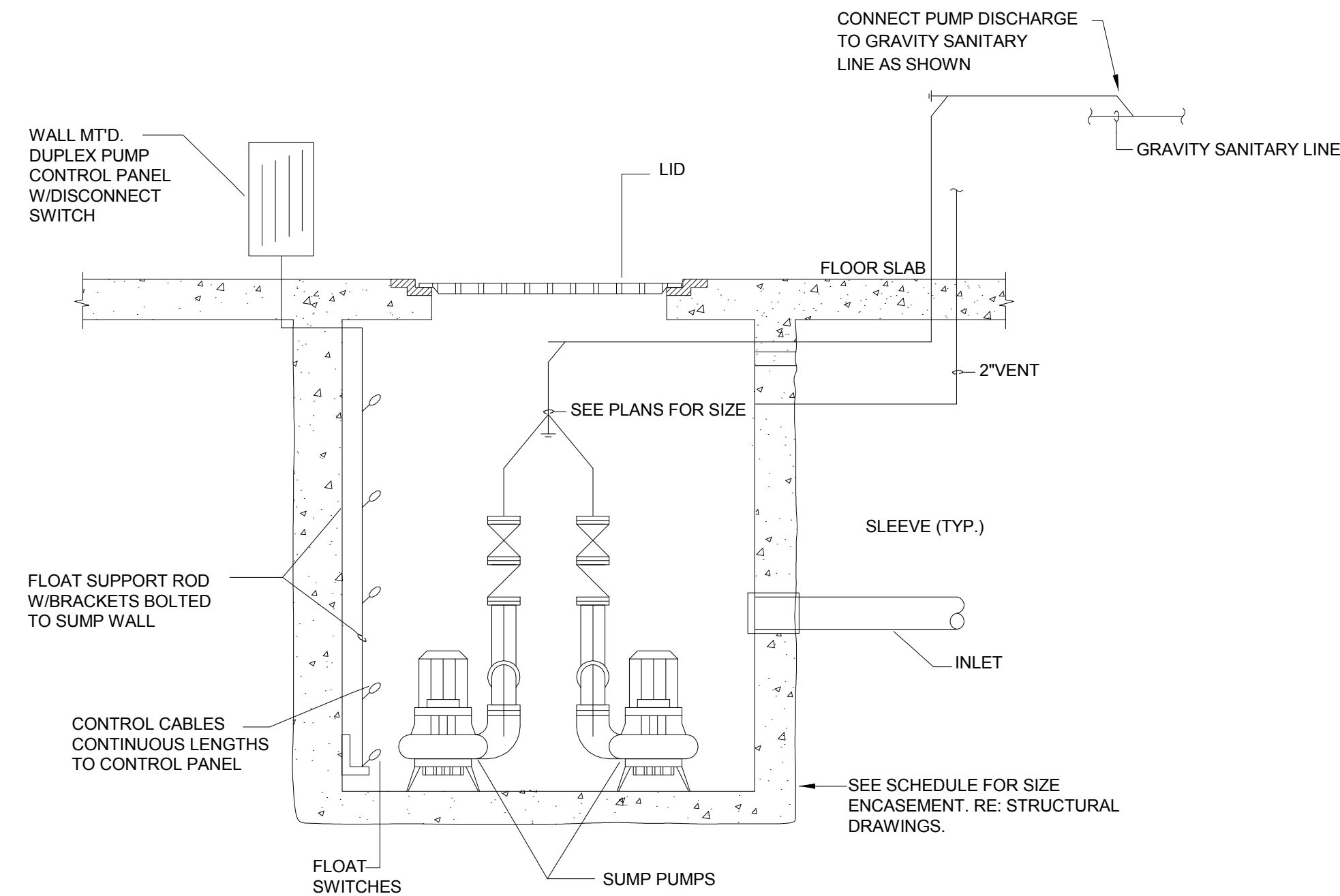
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PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL #	ACCESSORIES	PLUMBING CONNECTIONS			
					CW	HW	SAN	VENT
FD-1	DUGO CAST IRON BODY FLOOR DRAIN WITH FLASHING COLLAR AND 5" NICKEL BRONZE ROUND ADJUSTABLE STRAINER HEAD	JAY R. SMITH MFG. CO.	2005A-04-05-NB	SURE SEAL TRAP GUARD #SS4009	---	---	4"	2"
FD-2	DUGO CAST IRON BODY FLOOR DRAIN WITH FLASHING COLLAR AND 5" NICKEL BRONZE ROUND ADJUSTABLE STRAINER HEAD	JAY R. SMITH MFG. CO.	2005A-03-05-NB	SURE SEAL TRAP GUARD #SS3000	---	---	3"	2"

PLUMBING PUMP SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL #	PUMP DISCHARGE	MOTOR HP	Voltage	PHASE	PUMP Flow	PUMP Head	ACCESSORIES
SP-1	PREPACKAGED SEWAGE PUMPS 25 GPM @ 20 FT. HEAD DUPLEX CONTROLS WITH ALARM & SEAL SENSORS. 36" DIA x 60" DEEP FRP BASIN & COVER W/PREFAB DUPLEX RAIL SYSTEM	BELL & GOSSETT	1EC0411	2"	.4	120 V	1	25 GPM	9.00 psi	BELL & GOSSETT #D10020N1 PANEL
DWP-1	TRIPLEX SKID MOUNTED DOMESTIC WATER PUMP 50 GPM EACH	GRUNDFOS HYDRO	MPC-E 3 CRE 10-6	3"	5	208 V	3	50 GPM	90.00 psi	



1 SUMP PUMP DETAIL
NOT TO SCALE

PLUMBING SPECIFICATIONS

22 05 00 COMMON WORK RESULTS FOR PLUMBING

Demolition:
Remove pipe to above ceiling or below floor. Provide new supports for any remaining pipe that was supported by demolished walls. Damage to existing materials/equipment will be repaired at no additional cost. Where fixtures are removed, cap utilities inside wall, above ceiling, or below floor. Return demolished equipment/fixtures to Owner for re-use. If owner does not want same, properly dispose items off-site.

Shop drawings:
Submit all fixtures, trim, equipment, specialties and insulation for review by Engineer-of-Record.

Operations and maintenance instructions:
Provide 3-copies of operation and maintenance manuals to Owner. Provide instruction on system operation to Owner's representatives.

Record drawings:
Within 90 days after the date of system acceptance, provide record drawings in Revit/AutoCad Format (using the same software and version the project was designed in), plus full size hard copy. Project designed in Revit. Electronic drawings may be available from Engineer for a fee. Record drawings shall include, as a minimum, the installed location and performance data on each piece of equipment and plumbing fixture. In addition, provide general configuration of all piping distribution systems, including sizes. For below grade sanitary piping, provide installed invert elevations.

Coordination:
Provide Electrical Contractor with electrical requirements of approved equipment in sufficient time to order panel boards, disconnects, and related appurtenances.

Access doors
Provide Milcor, or equal, for access to all valves, controls, water hammer arrestors, or other devices requiring maintenance. Doors shall match wall or ceiling rating. Architect must approve location and appearance of all access doors, prior to installation.

Sleeves:
Provide metal sleeves where pipes or control wiring penetrate walls.

22 05 23 GENERAL DUTY VALVES FOR PLUMBING PIPING

Ball valves: Nibco 585 Series with NIB SEAL – two piece, fullport, bronze body, stainless steel trim, memory stop, with insulated handle; or equivalent in Scott, Kitz, or Milwaukee.

Check valves: iron body, swing check. Acceptable manufacturers include Nibco, Scott, Kitz, or Milwaukee.

22 05 29 HANGERS AND SUPPORTS

Pipe and equipment hangers and supports shall be per local code. Support all above floor piping utilizing support systems manufactured for the applicable installation. Wire or tape supports are not acceptable. Provide 4" reinforced concrete housekeeping pad with chamfered edges for all floor or ground mounted equipment. Isolate all water piping from direct contact with structural members (studs, joists, beams, etc.) to prevent the transmission of sound. Flash and seal equipment, pipe stacks, and roof penetrations.

22 05 73 PLUMBING COMPONENTS IDENTIFICATION

Equipment: permanent label (stencil, metal tag or engraved plastic) with unit tag or name and area or space served.
Piping: provide Brady or Seton pipe markers every 20 feet. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping.
Valve tags: Install engraved metal tags with corrosion resistant chain. Number tags consecutively by location.
Valve Tag Chart: Typewritten letter size list in anodized aluminum, or plastic laminated, frame.

22 07 19 PIPING INSULATION

All insulation must have flame spread less than 25 and smoke developed less than 50 as per ASTM E84, NFPA 255, and UL 273. Provide galvanized sheet metal shields at all pipe hangers for pipes 1 1/2" or larger. For pipe 4" and larger, provide high-density insulation (calcium silicate) inserts at hangers.

Floor drains receiving condensate from HVAC units or ice machines shall be insulated minimum 5-feet downstream of drain.

22 10 00 PLUMBING PIPING

Domestic hot/cold – ASTM B88 Type "L" copper with wrought copper or cast bronze fittings using lead-free solder joints. Or, press fit type copper fittings, up to 4" diameter and meeting ASME B16.18 and B16.22. Copper, or galvanized, grooved piping materials may be used with Engineer approval. System shall be drainable.

Testing: upon completion of construction, all domestic water piping shall be thoroughly flushed and sterilized. Submit Certificates of Testing for Engineer review.

Waste and vent – Above slab: ASTM A888 Service Weight hubless cast iron pipe and fittings, with ASTM C1540 heavy duty clamps and ASTM C561 Gaskets; and/or ASTM D1784 Schedule 40 PVC pipe shall be iron pipe size (IPS) conforming to ASTM D1785 and D2665, with DWV no-hub fittings and clamps. Fabricated DWV fittings shall conform to ASTM F1866. No-hub clamps shall be manufactured by 'Tyler Pipe,' 'Clamp-All,' 'Husky,' or 'Mission.' Transitions between underslab PVC and above slab cast iron shall be as detailed on plans.
NOTE: PVC shall not be used for waste, or vent, piping in any return air plenum.

Below slab: Drainage piping below slab shall be service weight cast iron bell and spigot or schedule 40 PVC with DWV no-hub fittings and clamps

Make connections between dissimilar piping materials with adaptors manufactured for the applicable type of transition.

Provide dielectric isolation device (dielectric union or coupling) where copper lines connect to ferrous lines or equipment.

Support piping every 10'-0" or less for 1" and larger pipe size; every 6'-0" for 3/4" or smaller piping. When installing non-insulated copper pipe, use copper hangers or tape at contact point.

All piping penetrations through floors shall be sealed with UL listed firestop.

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PLUMBING SPECIFICATIONS

Part 1 – GENERAL
1.1 WORK INCLUDED

- A. Variable Speed Packaged Pumping System
- 1.2 REFERENCE STANDARDS**
 The work in this section is subject to the requirements of applicable portions of the following standards:

- A. Hydraulic Institute
- B. ANSI – American National Standards Institute
- C. ASTM – American Society for Testing and Materials
- D. IEEE – Institute of Electrical and Electronics Engineers
- E. NEMA – National Electrical Manufacturers Association
- F. NEC – National Electrical Code
- G. ISO – International Standards Organization
- H. UL – Underwriters Laboratories, Inc.

Part 2 – PRODUCTS
2.1 VARIABLE SPEED PACKAGED PUMPING SYSTEM

- A. Furnish and install a pre-fabricated and tested variable speed packaged pumping system to maintain constant water delivery pressure.
- B. The packaged pump system shall be a standard product of a single pump manufacturer. The entire pump system including pumps and pump logic controller, shall be designed, built, and tested by the same manufacturer.
- C. The complete packaged water booster pump system shall be certified and listed by UL (Category QCZJ – Packaged Pumping Systems) for conformance to U.S. and Canadian Standards.
- D. The complete packaged pumping system shall be NSF61 Annex G listed for drinking water and low lead requirements.

2.2 PUMPS

- A. All pumps shall be ANSINSF 61 Annex G listed for drinking water and low lead requirements.
- B. The pumps shall be of the in-line vertical multi-stage design.
- C. The head-capacity curve shall have a steady rise in head from maximum to minimum flow within the preferred operating region. The shut-off head shall be a minimum of 20% higher than the head at the best efficiency point.
- D. Small Vertical In-Line Multi-Stage Pumps (Nominal flow from 3 to 125 gallons per minute) shall have the following features:

1. The pump impellers shall be secured directly to the pump shaft by means of a splined shaft arrangement.
2. The suction/discharge base shall have ANSI Class 250 flange or internal pipe thread (NPT) connections as determined by the pump station manufacturer.
3. Pump Construction.
 - a. Suction/discharge base, pump head, motor stool: Cast iron (Class 30)
 - b. Impellers, diffuser chambers, outer sleeve: 304 Stainless Steel
 - c. Shaft 316 or 431 Stainless Steel
 - d. Impeller wear rings: 304 Stainless Steel
 - e. Shaft journals and chamber bearings: Silicon Carbide
 - f. O-rings: EPDM

Shaft couplings for motor flange sizes 184TC and smaller shall be made of cast iron or sintered steel. Shaft couplings for motor flange sizes larger than 184TC shall be made of ductile iron (ASTM 60-40-18).

Optional materials for the suction/discharge base and pump head shall be cast 316 stainless steel (ASTM CF-8M) resulting in all wetted parts of stainless steel.

4. The shaft seal shall be a balanced o-ring cartridge type with the following features:

- a. Collar, Drivers, Spring: 316 Stainless Steel
- b. Shaft Sleeve, Gland Plate: 316 Stainless Steel
- c. Stationary Ring: Silicon Carbide
- d. Rotating Ring: Silicon Carbide
- e. O-rings: EPDM

The Silicon Carbide shall be imbedded with graphite.

5. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, shaft coupling and motor. The entire cartridge shaft seal shall be removable as a one piece component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.

- E. Large In-line Vertical Multi-Stage Pumps (Nominal flows from 130 to 500 gallons per minute) shall have the following features:

1. The pump impellers shall be secured directly to the smooth pump shaft by means of a split cone and nut design.
2. The suction/discharge base shall have ANSI Class 125 or Class 250 flange connections in a slip ring (rotating flange) design as indicated in the drawings or pump schedule.

- 3. Pump Construction.

- a. Suction/discharge base, pump head Ductile Iron (ASTM 65-45-12)
- b. Shaft couplings, flange rings: Ductile Iron (ASTM 65-45-12)
- c. Shaft 431 Stainless Steel
- d. Motor Stool Cast Iron (ASTM Class 30)
- e. Impellers, diffuser chambers, outer sleeve: 304 Stainless Steel
- f. Impeller wear rings: 304 Stainless Steel
- g. Intermediate Bearing Journals: Tungsten Carbide
- h. Intermediate Chamber Bearings: Leadless Tin Bronze
- i. Chamber Bushings: Graphite Filled PTFE
- j. O-rings: EPDM

4. The shaft seal shall be a single balanced metal bellows cartridge with the following construction:

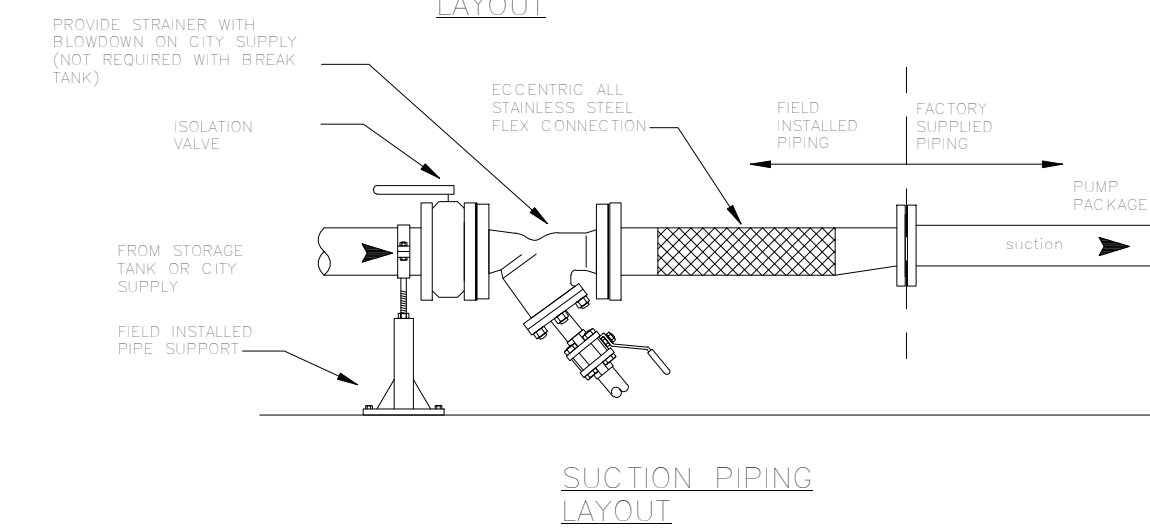
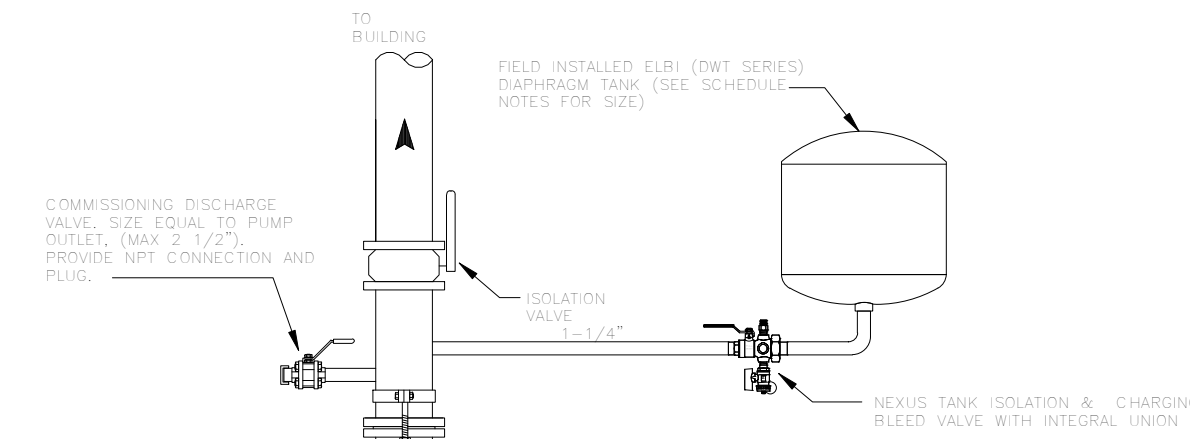
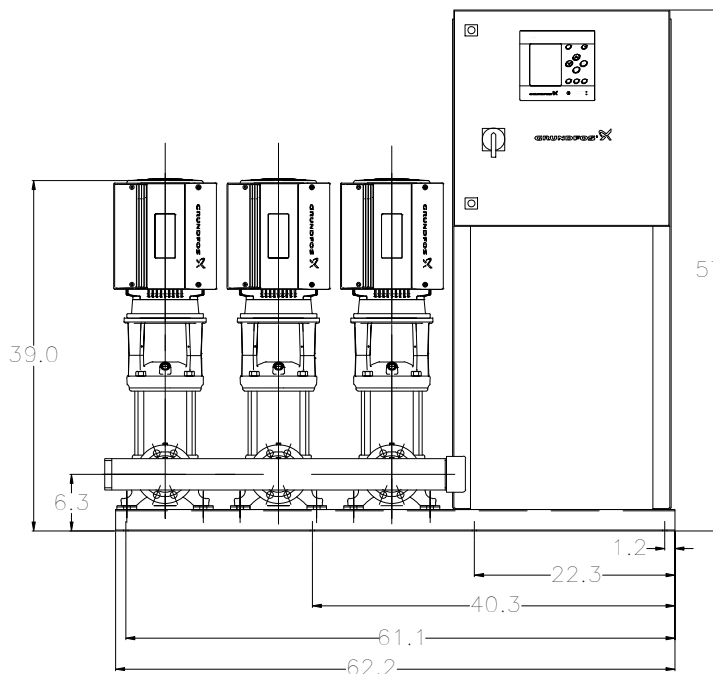
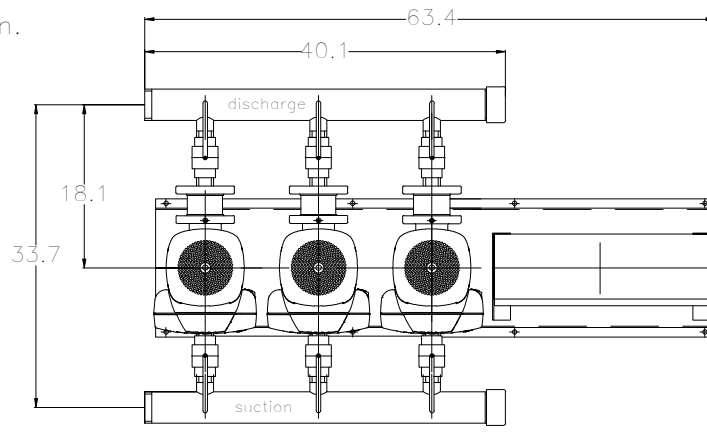
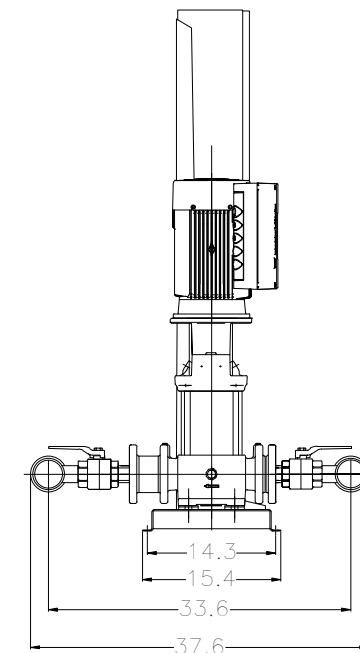
- a. Bellows: 904L Stainless Steel
- b. Shaft Sleeve, Gland Plate, Drive Collar: 316 Stainless Steel
- c. Stationary Ring: Carbon
- d. Rotating Ring: Tungsten Carbide
- e. O-rings: EPDM

5. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, motor couplings, motor and seal cover. The entire cartridge shaft seal shall be removable as a one piece component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.

2.3 VARIABLE FREQUENCY DRIVES (Panel Mount)

- A. The VFD shall convert incoming fixed frequency single-phase or three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC induction motors. The VFD shall be a six-pulse input design, and the input voltage rectifier shall employ a full wave diode bridge; VFD's utilizing controlled SCR rectifiers shall not be acceptable. The output waveform shall closely approximate a sine wave. The VFD shall be of a PWM output design utilizing current IGBT inverter technology and voltage vector control of the output PWM waveform.
- B. The VFD shall include a full-wave diode bridge rectifier and maintain a displacement power factor of near unity regardless of speed and load.
- C. The VFD shall produce an output waveform capable of handling maximum motor cable distances of up to 1,000 ft. (unshielded) without tripping or derating.
- D. The VFD shall utilize an output voltage-vector switching algorithm, or equivalent, in both variable and constant torque modes. VFD's that utilize Sine-Coded PWM or Look-up tables shall not be acceptable.
- E. VFD shall automatically boost power factor at lower speeds.
- F. The VFD shall be able to provide its full rated output current continuously at 110% of rated current for 60 seconds.
- G. An empty pipe fill mode shall be available to fill an empty pipe in a short period of time, and then revert to the PID controller for stable operation.
- H. Switching of the input power to the VFD shall be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes.
- I. Switching of power on the output side between the VFD and the motor shall be possible with no limitation or damage to the VFD and shall require no additional interlocks.

1. Manifolds 3" NPT Class 150 AISI 316SS Schedule 10s ASTM A312 or Ø88.9mm x2mm
 2. Base/Frame AISI 304SS
 3. Standard system layout : panel right facing suction.
 4. Full port ball valve ASTM
 5. UL Type 3R rated electrical panel
- Note: panel size will vary with options



ID	MANUFACTURER	MODEL NUMBER	TYPE	FLUID			ELECTRICAL		CONNECTIONS		NOTES	
				FLOW RATE GPM (EACH PUMP)	FLOW RATE GPM (TOTAL)	HEAD (PSI)	NUMBER OF MOTOR /SIZE (-/HP)	NOMINAL RPM	VOLT/PH	SUCTION		DISCHARGE
DWP-1,2,3	GRUNDFOS BOOSTERPAQ	MPC-E 3CRE10-6	VERTICAL MULTI-STAGE	50	150	90	3 @ 5 HP	3500	480/3	3"	3"	1,2,3,4,5,6,7

1. PROVIDE VFD ON EACH PUMP. DRIVES SHALL BE CONTAINED WITHIN A SINGLE ELECTRICAL ENCLOSURE (MIN. NEMA 3R UNLESS NOTED OTHERWISE), PANEL SHALL HAVE MAIN DISCONNECT AND SINGLE POINT CONNECTION.
2. PROVIDE A 80 GALLON ASME 150 PSI RATED BLADDER TANK AS INDICATED.
3. PACKAGE TO INCLUDE DRY-RUN PROTECTION, SURGE PROTECTION, INDIVIDUAL PUMP RUN INDICATION, PROVIDE COMMUNICATION INTERFACE WITH BUILDING AUTOMATION SYSTEM EITHER BACNET, MODBUS OR LONWORKS FOR SYSTEM CONDITIONS AND ALL ALARMS INCLUDING: LOW SUCTION ALARM, LOW SYSTEM PRESSURE, HIGH SYSTEM PRESSURE, PUMP/VFD FAULT, PUMP STATUS (EACH PUMP), SYSTEM SET POINT, SYSTEM PRESSURE, PUMP RUN TIMES, SYSTEM ENERGY CONSUMPTION.
4. HEADERS SHALL BE CONSTRUCTED OF 316 SS WITH FLANGED CONNECTIONS ON ALL ENDS, PROVIDE ISOLATION VALVES ON EACH PUMP.
5. PROVIDE REMOTE PRESSURE SENSOR OR PROPORTIONAL PRESSURE CONTROL IN ACCORDANCE WITH ASHRAE 90.1.
6. PACKAGE SUPPLIER SHALL INCLUDE ANY AND ALL SENSORS AS REQUIRED FOR DATA ACQUISITION AND OPERATION.
7. A FACTORY AUTHORIZED AGENT IS REQUIRED TO START-UP AND COMMISSION THIS PACKAGE IN ORDER TO NOT VOID THE WARRANTY.



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GRUNDFOS BOOSTERPAQ
 SCHEDULE AND DETAIL

Sheet No.

P-1

ISSUE FOR INFORMATION

No.	Description	Date
	ISSUE FOR PERMIT	05/24/18
	ISSUE FOR BID	08/17/18

FAIR AVENUE APARTMENTS SPRINKLER DESIGN
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08-15-18

PROJECT NUMBER 7917053.00
DRAWN BY Designer
CHECKED BY Checker
SHEET DATE 08/17/18
DOMESTIC WATER PUMP DETAIL AND SPECS

P.200

- J. The VFD shall have temperature controlled cooling fans for quiet operation, minimized internal losses, and greatly increased fan life.
- K. VFD shall provide full torque to the motor given input voltage fluctuations of up to +10% to -15% of the rated input voltage.
- L. The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. VFD's without a DC link reactor shall provide a 5% impedance line side reactor.
- M. VFD to be provided with the following protective features:
- VFD shall have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.3 msec.
 - VFD shall include circuitry to detect phase imbalance and phase loss on the input side of the VFD.
 - VFD shall include current sensors on all three-output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.
 - VFD shall auto-derate the output voltage and frequency to the motor in the presence of sustained ambient temperatures higher than the normal operating range, so as not to trip on an inverter temperature fault. The use of this feature shall be user-selectable and a warning will be exported during the event. Function shall reduce switching frequency before reducing motor speed.
 - VFD shall auto-derate the output frequency by limiting the output current before allowing the VFD to trip on overload. Speed can be reduced, but not stopped.
 - The VFD shall have the option of an integral RFI filter. VFD enclosures shall be made of metal to minimize RFI and provide immunity.
- N. VFD to be provided with the following interface features:
- VFD shall provide an alphanumeric backlit display keypad, which may be remotely mounted using standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. Keypad may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD.
 - VFD shall display all faults in plain text; VFD's, which can display only fault codes, are not acceptable.
 - All VFD's shall be of the same series, and shall utilize a common control card and LCP (keypad/display unit) throughout the rating range. The control cards and keypads shall be interchangeable through the entire range of drives used on the project.
 - VFD keypad shall be capable of storing drive parameter values in non-volatile RAM uploaded to it from the VFD, and shall be capable of downloading stored values to the VFD to facilitate programming of multiple drives in similar applications, or as a means of backing up the programmed parameters.
 - A red FAULT light, a yellow WARNING light, a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.
 - A start guide menu with factory preset typical parameters shall be provided on the VFD to facilitate commissioning.
 - VFD shall provide full galvanic isolation with suitable potential separation from the power sources (control, signal, and power circuitry within the drive) to ensure compliance with PELV requirements and to protect PLC's and other connected equipment from power surges and spikes.
 - All inputs and outputs shall be optically isolated. Isolation boards between the VFD and external control devices shall not be required.
 - There shall be three programmable digital inputs for interfacing with the systems external control and safety interlock circuitry. An additional digital input is preprogrammed for start/stop.
 - The VFD shall have two analog signal inputs. One dedicated for sensor input and one for external set point input.
 - One programmable analog output shall be provided for indication of a drive status.
 - The VFD shall provide two user programmable relays with selectable functions. Two form 'C' 230VAC/2A rated dry contact relay outputs shall be provided.
 - The VFD shall store in memory the last 5 faults with time stamp and recorded data.
 - The VFD shall be equipped with a standard RS-485 serial communications port for communication to the multi-pump controller. The bus communication protocol for the VFD shall be the same as the controller protocol.
- O. VFD service conditions:
- Ambient temperature operating range, -10 to 45°C (14 to 113°F).
 - 0 to 95% relative humidity, non-condensing.
 - Elevation to 1000 meters (3,300 feet) without derating.
 - VFD's shall be rated for line voltage of 525 to 690VAC, 380 to 480VAC, or 200 to 240VAC; with +10% to -15% variations. Line frequency variation of ± 2% shall be acceptable.
 - No side clearance shall be required for cooling of the units.

2.4 FIXED SPEED MOTORS

- A. Fixed Speed Motors are to be provided with the following basic features:
- Designed for continuous duty operation, NEMA design B with a 1.15 service factor.
 - Totally Enclosed Fan Cooled or Open Drip Proof with Class F insulation.
 - Nameplate shall have, as a minimum, all information as described in NEMA Standard MG 1-20.40.1.
 - Motors shall have a NEMA C-Flange for vertical mounting.
 - Drive end bearings shall be adequately sized so that the minimum L10 bearing life is 17,500 hours at the minimum allowable continuous flow rate for the pump.

2.5 PUMP SYSTEM CONTROLLER

- A. The pump system controller shall be a standard product developed and supported by the pump manufacturer.
- B. The controller shall be microprocessor based capable of having software changes and updates via personal computer (notebook). The controller user interface shall have a color display with a minimum screen size of 3-1/2" x 4-5/8" for easy viewing of system status parameters and for field programming. The display shall have a back light with contrast adjustment. Password protection of system settings shall be standard.
- C. The controller shall provide internal galvanic isolation to all digital and analog inputs as well as all fieldbus connections.
- D. The controller shall have the ability to be connected to a battery to maintain power on controller during periods of loss of supply power.
- E. The controller shall have built in data logging capability. Logged vales shall be graphically displayed on the controller and able to be exported to computer via standard connection. A minimum of 3600 samples per logged value with the following parameters available for logging:
- § Estimated flow-rate
 - § Speed of pumps
 - § Inlet pressure
 - § Discharge pressure
 - § Power consumption
 - § Controlling parameter (process value)

- F. The controller shall display the following as status readings from a single display on the controller (this display shall be the default):
- Current value of the control parameter, (typically discharge pressure)
 - Most recent existing alarm (if any)
 - System status with current operating mode
 - Status of each pump with current operating mode and rotational speed as a percentage (%)
 - Estimated flow-rate, (not requiring flow meter connection)

- G. The controller shall have as a minimum the following hardware inputs and outputs:
- Three analog inputs (4-20mA or 0-10VDC)
 - Three digital inputs
 - Two digital outputs
 - Ethernet connection
 - Field Service connection to PC for advanced programming and data logging

- H. Pump system programming (field adjustable) shall include as a minimum the following:
- Water shortage protection (analog or digital)
 - Transducer Settings (Suction and Discharge Analog supply/range)
 - PI Controller (Proportional gain and Integral time) settings
 - High system pressure indication and shut-down
 - Low system pressure indication and shut-down

- Low suction pressure/level shutdown (via digital contact)
- Low suction pressure/level warning (via analog signal)
- Low suction pressure/level shutdown (via analog signal)
- Flow meter settings (if used, analog signal)

I. The system controller shall be able to accept up to seven programmable set-points via a digital input, (additional input/output module may be required).

J. The controller shall have advanced water shortage protection. When analog sensors (level or pressure) are used for water shortage protection, there shall be two indication levels. One level is for warning indication only (indication that the water level/pressure is getting lower than expected levels) and the other level is for complete system shut-down (water or level is so low that pump damage can occur). System restart after shut-down shall be manual or automatic (user selectable).

K. The system pressure set-point shall be capable of being automatically adjusted by using an external set-point influence. The set-point influence function enables the user to adjust the control parameter (typically pressure) by measuring an additional parameter. (Example: Lower the system pressure set-point based on a flow measurement to compensate for lower friction losses at lower flow rates).

L. The controller shall be capable of receiving a remote analog set-point (4-20mA or 0-10 VDC) as well as a remote system on/off (digital) signal.

M. The controller shall be able to adjust the ramp time of a change in set point on both an increase or decrease change in set point.

N. The pump system controller shall store up to 24 warning and alarms in memory. The time, date and duration of each alarm shall be recorded. A potential-free relay shall be provided for alarm notification to the building management system. The controller shall display the following alarm conditions:

High System Pressure	Low system pressure
Low suction pressure (warning and alarm)	Individual pump failure
VFD trip/failure	Loss of sensor signal (4-20 mA)
Loss of remote set-point signal (4-20mA)	System power loss

O. The pump system controller shall be mounted in a UL Type 12 rated enclosure. A self-certified NEMA enclosure rating shall not be considered equal. The entire control panel shall be UL 508 listed as an assembly. The control panel shall include a main disconnect, circuit breakers for each pump and the control circuit and control relays for alarm functions.

Control panel options shall include, but not be limited to:

Pump Run Lights	System Fault Light
Audible Alarm (60 db[A])	Surge Arrestor
Emergency/Normal Operation Switches	Service Disconnect Switches
Qty (9) Configurable Digital Outputs available for monitoring	

P. The controller shall be capable of receiving a redundant sensor input to function as a backup to the primary sensor (typically discharge pressure).

Q. The controller shall have a pump "Test Run" feature such that pumps are switched on during periods of inactivity (system is switched to the off position but with electricity supply still connected). The inoperative pumps shall be switched on for a period of two to three (3-4) seconds every 24 hours, 48 hours or once per week and at specific time of day (user selectable).

R. The controller shall be capable of changing the number of pumps available to operate or have the ability limit the maximum power consumption by activation of a digital input for purposes of limited generator supplied power.

S. The controller shall be capable of displaying instantaneous power consumption (Watts or kilowatts) and cumulative energy consumption (kilowatt-hours).

T. The controller shall be capable of displaying instantaneous specific energy use (kw/gpm), (optional flow meter must be connected).

U. The actual pump performance curves (5th order polynomial) shall be loaded (software) into the pump system controller or be able to input manually into controller based on three points on pump curve of pumps controlled.

V. The controller shall be capable of displaying an estimated flow-rate on the default status screen.

W. The controller shall have the ability to compensate for pipe friction loss by decreasing pressure set-point at lower flow-rates and increasing pressure set-point at higher flow-rates without the requirement of a flow meter.

X. The controller shall have the ability to communicate common field-bus protocols, (BACnet, Modbus, Profibus, and LON), via optional communication expansion card installed inside controller.

Y. The controller shall have a built in Ethernet connection allowing controller to be connected to network and access of controller via web browser and internet any where around the world where internet communication is available.

Z. The controller shall have a programmable Service Contact Field that can be populated with service contact information including: contact name, address, phone number(s) and website.

2.6 SEQUENCE OF OPERATION

A. The system controller shall operate equal capacity variable speed pumps to maintain a constant discharge pressure (system set-point). The system controller shall receive an analog signal [4-20mA] from the factory installed pressure transducer on the discharge manifold, indicating the actual system pressure. As flow demand increases the pump speed shall be increased to maintain the system set-point pressure. When the operating pump(s) reach 96% of full speed (adjustable), an additional pump will be started and will increase speed until the system set-point is achieved. When the system pressure is equal to the system set-point all pumps in operation shall reach equal operating speeds. As flow demand decreases the pump speed shall be reduced while system set-point pressure is maintained. When all pumps in operation are running at low speed the system controller shall switch off pumps when fewer pumps are able to maintain system demand.

B. The system controller shall be capable of switching pumps on and off to satisfy system demand without the use of flow switches, motor current monitors or temperature measuring devices.

C. All pumps in the system shall alternate automatically based on demand, time and fault. If flow demand is continuous (no flow shut-down does not occur), the system controller shall have the capability to alternate the pumps every 24 hours, every 48 hours or once per week. The interval and actual time of the pump change-over shall be field adjustable.

D. The system controller shall be able to control a pressure maintenance pump, (jockey pump), in the system. The set point of the pressure maintenance pump shall be able to be any value above or below the pump system's set point. The pressure maintenance pump shall be able to be staged on as back-up pump when capacity of pump system is exceeded.

2.7 LOW FLOW STOP FUNCTION

The system controller shall be capable of stopping pumps during periods of low-flow or zero-flow without wasting water or adding unwanted heat to the liquid. Temperature based no flow shut-down methods that have the potential to waste water and add unwanted temperature rise to the pumping fluid are not acceptable.

Standard Low Flow Stop and Energy Saving Mode

If a low or no flow shut-down is required (periods of low or zero demand) a bladder type diaphragm tank shall be installed with a pre-charge pressure of 70% of system set-point. The tank shall be piped to the discharge manifold or system piping downstream of the pump system. When only one pump is in operation the system controller shall be capable of detecting low flow (less than 10% of pump nominal flow) without the use of additional flow sensing devices. When a low flow is detected, the system controller shall increase pump speed until the discharge pressure reaches the stop pressure (system set-point plus 50% of programmed on/off band). The pump shall remain off until the discharge pressure reaches the start pressure (system set-point minus 50% of programmed on/off band). Upon low flow shut-down a pump shall be restarted in one of the following two ways:

A. Low Flow Restart: If the drop in pressure is slow when the start pressure is reached (indicating the flow is still low), the pump shall start and the speed shall again be increased until the stop pressure is reached and the pump shall again be switched off.

B. Normal Flow Restart: If the drop in pressure is fast (indicating the flow is greater than 10% of pump nominal flow) the pump shall start and the speed shall be increased until the system pressure reaches the system set-point.

[OPTIONAL] Low Flow Stop and Energy Saving Mode

The pump system controller shall be capable receiving a digital signal from a flow switch or an analog signal from a flow meter to indicate a low flow condition. A bladder type diaphragm tank shall be installed with a pre-charge pressure of 70% of system set-point. The tank shall be piped to the discharge manifold or system piping downstream of the pump system. When low flow is detected (signal from flow switch or meter), the system controller shall increase pump speed until the discharge pressure reaches the stop pressure (system set-point plus 50% of programmed on/off band). The pump shall remain off until the discharge pressure reaches the start pressure (system set-point minus 50% of programmed on/off band). The pump shall remain in the energy saving on/off mode during low flow indication. When low flow is no longer present (low flow indication ceases), the pump(s) shall resume constant pressure operation.

It shall be possible to change from the standard low flow stop to the optional low flow stop (and vice-versa) via the user interface.

2.8 SYSTEM CONSTRUCTION

A. Suction and discharge manifold construction shall be in way that ensures minimal pressure drops, minimize potential for corrosion, and prevents bacteria growth at intersection of piping into the manifold. Manifold construction that includes sharp edge transitions or interconnecting piping protruding into manifold is not acceptable. Manifold construction shall be such that water stagnation can not exist in manifold during operation to prevent bacteria growth inside manifold.

B. The suction and discharge manifolds shall be constructed of 316 stainless steel. Manifold connection sizes shall be as follows:

3 inch and smaller:	Male NPT threaded
4 inch through 8 inch:	ANSI Class 150 rotating flanges
10 inch and larger:	ANSI Class 150 flanges

C. Pump isolation valves shall be provided on the suction and discharge of each pump. Isolation valve sizes 2 inch and smaller shall be nickel plated brass full port ball valves. Isolation valve sizes 3 inch and larger shall be a full lug style butterfly valve. The valve disk shall be of stainless steel. The valve seat material shall be EPDM and the body shall be cast iron, coated internally and externally with fusion-bonded epoxy.

D. A spring-loaded non-slam type check valve shall be installed on the discharge of each pump. The valve shall be a wafer style type fitted between two flanges. The head loss through the check valve shall not exceed 5 psi at the pump design capacity. Check valves 1-1/2" and smaller shall have a POM composite body and poppet, a stainless steel spring with EPDM or NBR seats. Check valves 2" and larger shall have a body material of stainless steel or epoxy coated iron (fusion bonded) with an EPDM or NBR resilient seat. Spring material shall be stainless steel. Disk shall be of stainless steel or leadless bronze.

E. For systems that require a diaphragm tank, a connection of no smaller than 1/4" shall be provided on the discharge manifold.

F. A pressure transducer shall be factory installed on the discharge manifold (or field installed as specified on plans). Systems with positive inlet gauge pressure shall have a factory installed pressure transducer on the suction manifold for water shortage protection. Pressure transducers shall be made of 316 stainless steel. Transducer accuracy shall be +/- 1.0% full scale with hysteresis and repeatability of no greater than 0.1% full scale. The output signal shall be 4-20 mA with a supply voltage range of 9-32 VDC.

G. A bourdon tube pressure gauge, 2.5 inch diameter, shall be placed on the suction and discharge manifolds. The gauge shall be liquid filled and have copper alloy internal parts in a stainless steel case. Gauge accuracy shall be 2/12 %. The gauge shall be capable of a pressure of 30% above its maximum span without requiring recalibration.

H. Systems with a flooded suction inlet or suction lift configuration shall have a factory installed water shortage protection device on the suction manifold.

I. The base frame shall be constructed of corrosion resistant 304 stainless steel. Rubber vibration dampers shall be fitted between each pumps and baseframe to minimize vibration.

J. Depending on the system size and configuration, the control panel shall be mounted in one of the following ways:

- On a 304 stainless steel fabricated control cabinet stand attached to the system skid.
- On a 304 stainless steel fabricated skid, separate from the main system skid
- On its own base (floor mounted with plinth)

2.9 TESTING

A. The entire pump station shall be factory tested for functionality. Functionality testing shall include the following parameters: Dry Run Protection, Minimum Pressure and Maximum Pressure alarms (where applicable), Setpoint Operation, and Motor Rotation.

B. The system shall undergo a factory hydrostatic test at the end of the production cycle. The system shall be filled with water and pressurized to 1.5 times the nameplate maximum pressure. Systems with 150# flange connections shall be tested at 350 psig, and systems with 300# flange connections shall be tested at 450 psig. The pressure shall be maintained for a minimum of 15 minutes with no leakage (slight leakage around pump(s) mechanical seal is acceptable) prior to shipment.

2.10 WARRANTY

A. The warranty period shall be a non-prorated period of 24 months from date of installation, not to exceed 30 months from date of manufacture.

No.	Description	Date
	ISSUE FOR PERMIT	05/24/18
	ISSUE FOR BID	06/17/18

FAIR AVENUE APARTMENTS SPRINKLER DESIGN

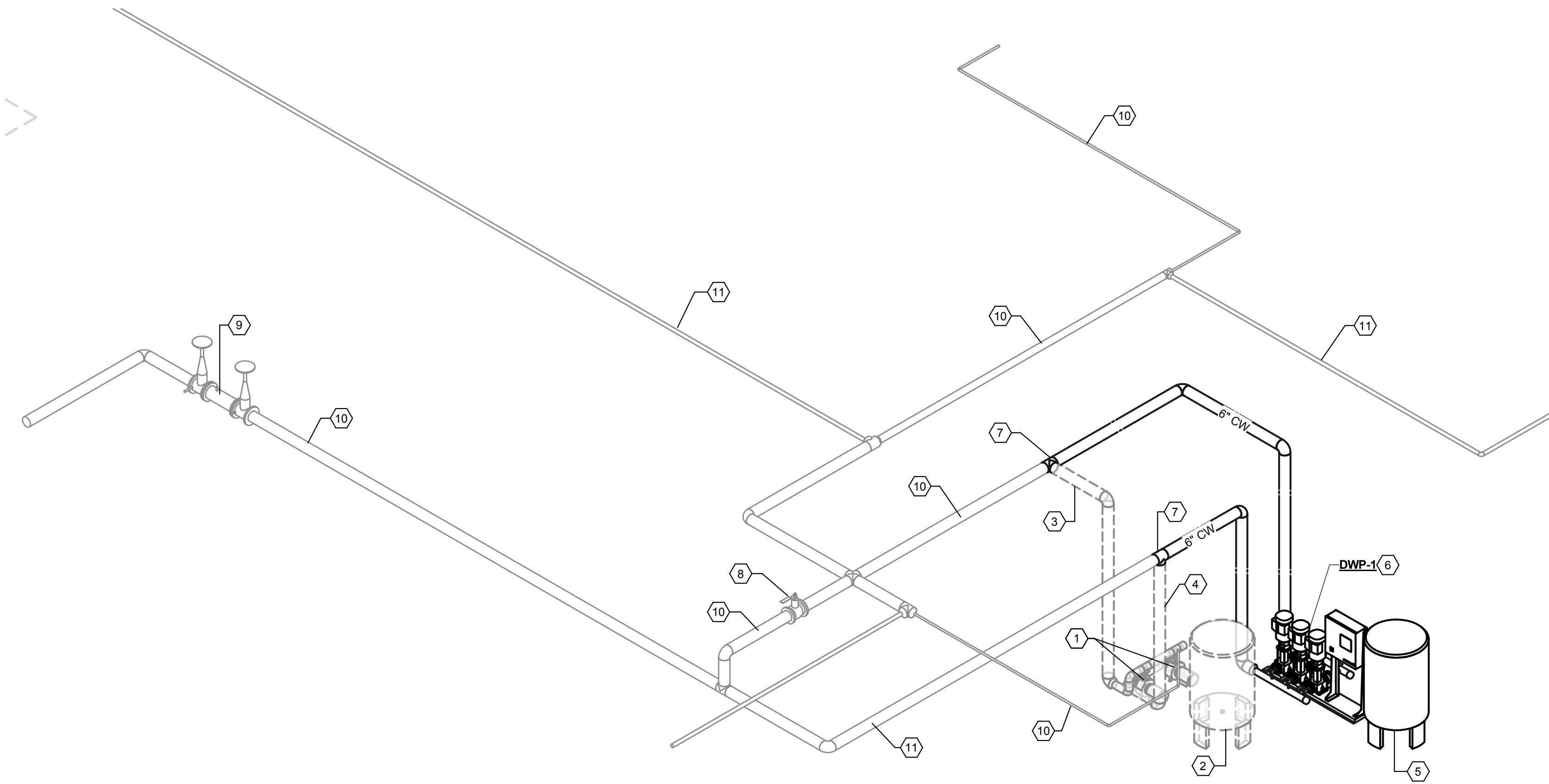
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PROJECT NUMBER 7917053.00
DRAWN BY Designer
CHECKED BY Checker
SHEET DATE 08/17/18
DOMESTIC WATER PUMP SPECIFICATIONS CONTINUED

P.201

08-15-18



1 DOMESTIC WATER RISER

KEYED NOTES

- 1 EXISTING DOMESTIC WATER PUMP TO BE REMOVED. PUMP TO REMAIN IN SERVICE UNTIL NEW DWP-1 IS INSTALLED AND FULLY FUNCTIONAL. REMOVE EXISTING HOUSE KEEPING PAD AND REPAIR SLAB TO MATCH EXISTING.
- 2 EXISTING BLADDER TANK TO BE REMOVED. TANK TO REMAIN IN SERVICE UNTIL NEW DWP-1 IS INSTALLED AND FULLY FUNCTIONAL.
- 3 ONCE DWP-1 IS INSTALLED AND FULLY FUNCTIONAL WATER FROM EXISTING DOMESTIC WATER PUMP IS TO BE CAPPED.
- 4 ONCE DWP-1 IS INSTALLED AND FULLY FUNCTIONAL WATER TO EXISTING DOMESTIC WATER PUMP IS TO BE CAPPED.
- 5 NEW 80 GALLON ASME 150 PSI RATED BLADDER TANK. COORDINATE FINAL LOCATION WITH MANUFACTURE REQUIREMENTS AND BUILDING OWNER.
- 6 NEW TRIPLEX DOMESTIC WATER PUMP. CONNECT TO EXISTING PIPING AS SHOWN.
- 7 CONNECT NEW 6" CW TO EXISTING IN THE AREA.
- 8 EXISTING BYPASS TO REMAIN. EXISTING BYPASS VALVE TO BE REPLACED WITH NEW SELF-BALANCING VALVE.
- 9 EXISTING BACKFLOW PREVENTER TO REMAIN.
- 10 EXISTING WATER PIPING TO REMAIN.
- 11 EXISTING WATER PIPING TO REMAIN.

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DOMESTIC WATER RIASER DIAGRAM

ADS LEGEND

- INTELLIGIBILITY NOT REQUIRED
- INTELLIGIBILITY REQUIRED

BUILDING FIRE ALARM NOTES

1. WIRING IN DWELLING UNITS SHALL BE IN METALLIC RACEWAY PAINTED TO MATCH THE COLOR OF THE UNIT WALLS. CONTRACTOR SHALL USE TYPICAL ELBOW FITTINGS THROUGHOUT THE BUILDING FOR AESTHETIC CONSISTENCY.
2. INTELLIGIBILITY (I.E., A CIS OF 0.7 OR GREATER) IS REQUIRED IN ALL CORRIDORS AND COMMON AREAS AS INDICATED ON DRAWINGS. INTELLIGIBILITY IS NOT REQUIRED WITHIN DWELLING UNITS OR BACK OF HOUSE SPACES.
3. CIRCUIT REQUIREMENTS: ALL FIRE ALARM WIRING, BOTH CONCEALED AND EXPOSED, SHALL BE PROVIDED IN METALLIC RACEWAY.
4. ALL DWELLING UNIT LIVING ROOMS SHALL BE PROVIDED WITH FIRE ALARM VISUAL NOTIFICATION (SACO §907.5.2.3.4).
5. SURFACE MOUNT CONDUIT SHALL BE PAINTED TO MATCH EXISTING WALL COLORS.
6. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

SMOKE ALARM NOTES

1. 120-VOLT SMOKE ALARMS SHALL BE PHOTOELECTRIC TYPE DEVICES.
2. 120-VOLT SMOKE ALARMS SHALL BE HARDWIRED WITH BATTERY BACKUP. DEVICES WITHIN A SINGLE DWELLING UNIT SHALL BE INTERCONNECTED SUCH THAT ANY INDIVIDUAL ALARM ACTIVATES ALL ALARMS WITHIN THE DWELLING UNIT.
3. PROVIDE 120-VOLT SMOKE ALARM DEVICES WITHIN EACH SLEEPING ROOM IN A DWELLING UNIT AND ANOTHER IN THE IMMEDIATE VICINITY OF THE BEDROOM(S) AS ILLUSTRATED.
4. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 3- FEET OF BATHROOM DOORS.
5. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 6- FEET OF A PERMANENTLY INSTALLED COOKING APPLIANCE.

KEYNOTE LEGEND

#	NOTE
1	PROVIDE 2 MONITOR MODULES FOR SPRINKLER ZONE CONTROL ASSEMBLY WATER FLOW SWITCH AND TAMPER SWITCH. TYPICAL ON ALL LEVELS IN NORTH AND SOUTH STAIRWELLS.
2	PROVIDE SMOKE DETECTOR FOR THE PURPOSES OF ELEVATOR RECALL.
3	CONFIRM ACCEPTANCE OF FINAL FACU LOCATION BY LOCAL AHJ PRIOR TO INSTALLATION.
4	PROVIDE NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANELS AND VOICE AMPLIFICATION PANELS ON SELECT FLOORS AS NECESSARY.
5	PROVIDE AUDIO DEVICE ON LEVELS 1, 3, 5, 7, 9, AND 11 WITHIN THE STAIRWELL.
6	NO AUDIO DEVICES WITH A 15-FT RADIUS OF FACU TO AVOID MICROPHONE FEEDBACK. NO INTELLIGIBILITY REQUIRED IN THIS ZONE.
7	PROVIDE WEATHRPOOF HORN (NOT SPEAKER) DEVICE ABOVE FIRE DEPARTMENT CONNECTION. FDC PROVIDED BY THE SPRINKLER CONTRACTOR.

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS

SAN ANTONIO HOUSING AUTHORITY
1215 FAIR AVENUE
SAN ANTONIO, TEXAS

ENGINEERS
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Ph: (210)544-5751
Texas Registered Engineering Firm #10573

M. Hulcher 2018-08-17

PROJECT NUMBER
7917053.00

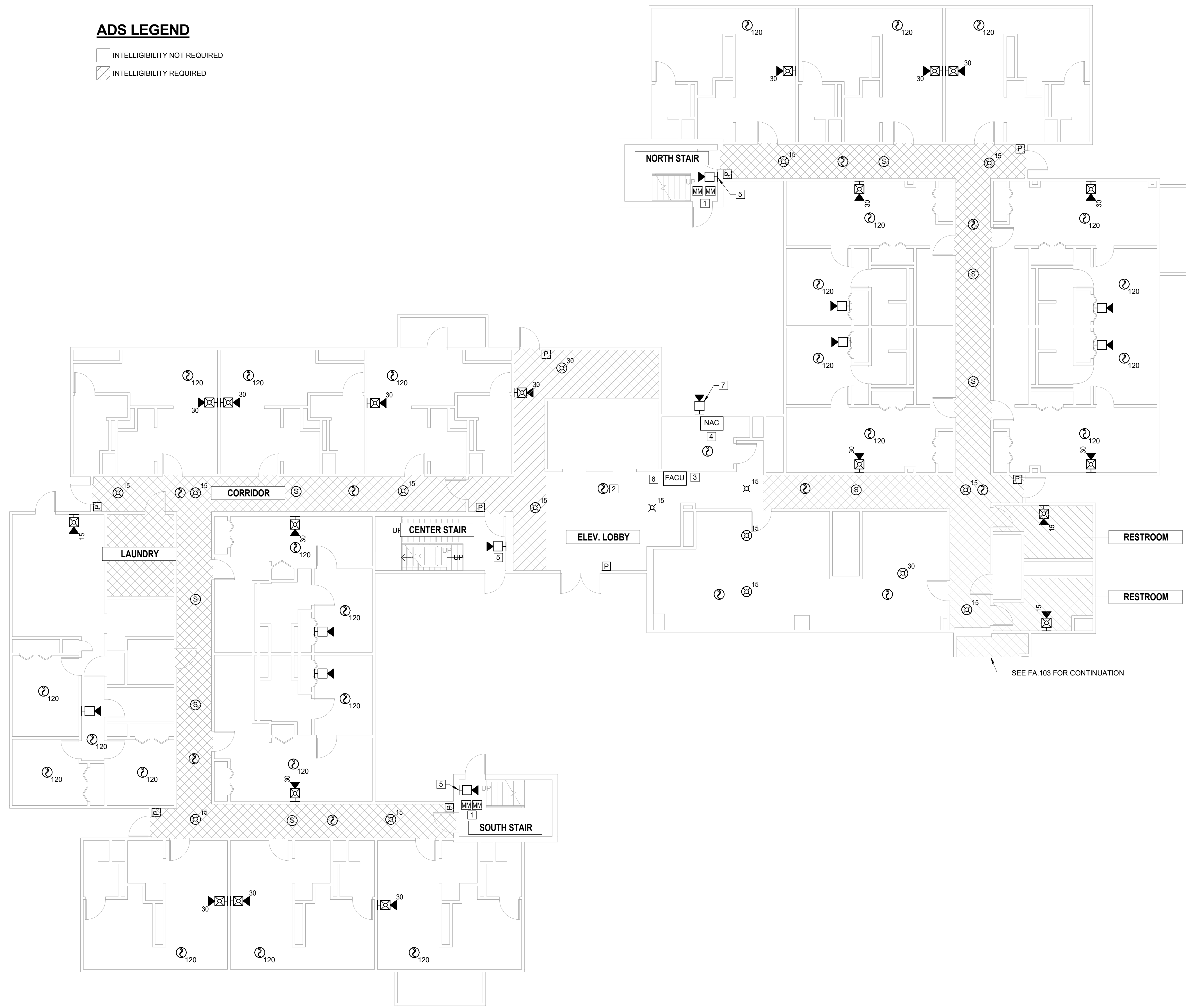
DRAWN BY
M. PRICE

CHECKED BY
M. HULCHER

SHEET DATE
08/17/2018

FIRE ALARM LEVEL 1 FLOOR PLAN

FA.102



1 FIRE ALARM LEVEL 1 FLOOR PLAN
1/8" = 1'-0"

0 4' 8' 16'
SCALE: 1/8" = 1'0"

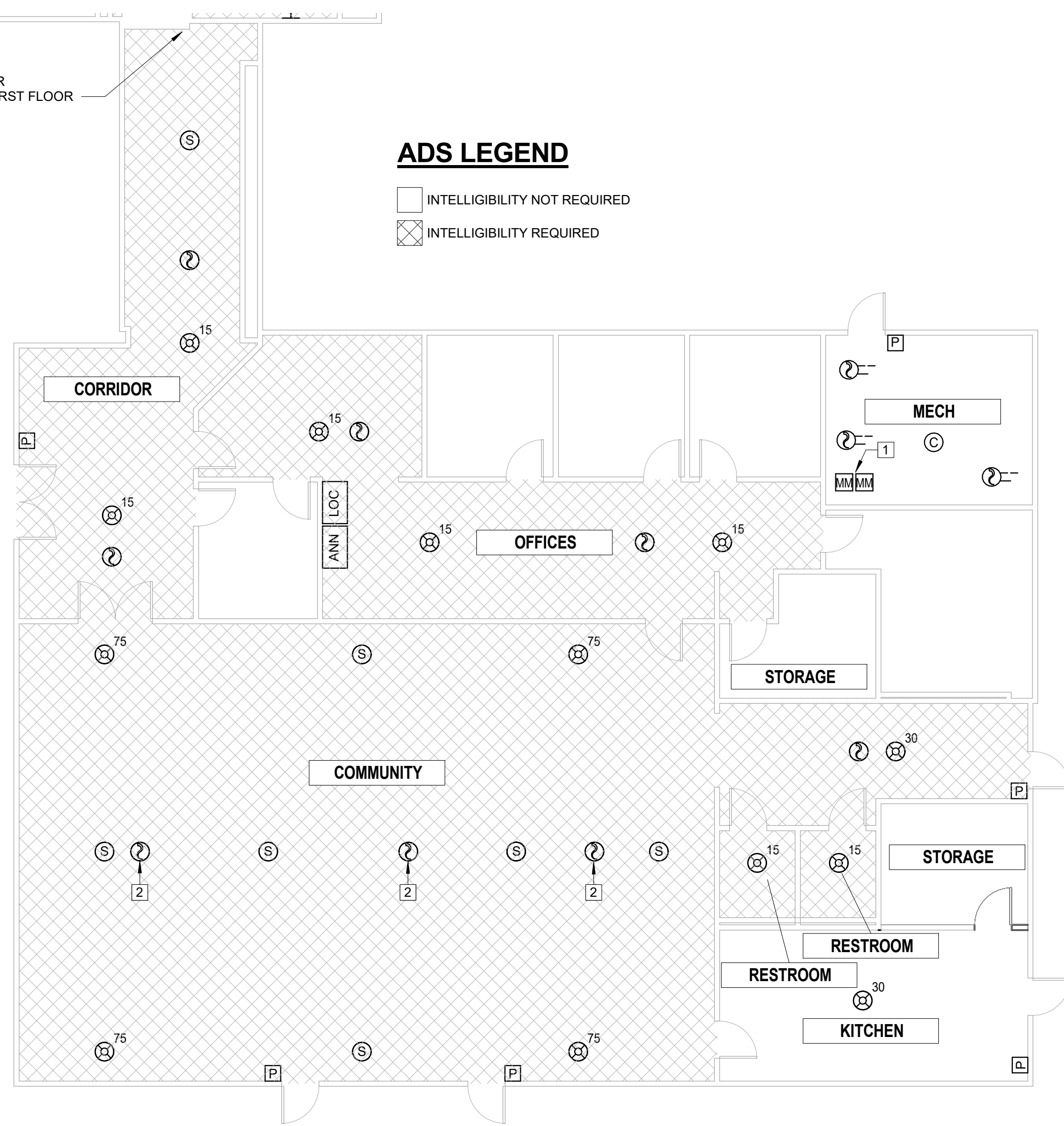


No.	Description	Date
	ISSUE FOR BID	08/17/18

SEE PAGE FA-102 FOR CONTINUATION OF FIRST FLOOR

ADS LEGEND

- INTELLIGIBILITY NOT REQUIRED
- INTELLIGIBILITY REQUIRED



① FIRE ALARM LEVEL 1 OFFICES AND COMMUNITY CENTER
1/8" = 1'-0"

BUILDING FIRE ALARM NOTES

1. WIRING IN DWELLING UNITS SHALL BE IN METALLIC RACEWAY PAINTED TO MATCH THE COLOR OF THE UNIT WALLS. CONTRACTOR SHALL USE TYPICAL ELBOW FITTINGS THROUGHOUT THE BUILDING FOR AESTHETIC CONSISTENCY.
2. INTELLIGIBILITY (I.E., A CIS OF 0.7 OR GREATER) IS REQUIRED IN ALL CORRIDORS AND COMMON AREAS AS INDICATED ON DRAWINGS. INTELLIGIBILITY IS NOT REQUIRED WITHIN DWELLING UNITS OR BACK OF HOUSE SPACES.
3. CIRCUIT REQUIREMENTS: ALL FIRE ALARM WIRING, BOTH CONCEALED AND EXPOSED, SHALL BE PROVIDED IN METALLIC RACEWAY.
4. ALL DWELLING UNIT LIVING ROOMS SHALL BE PROVIDED WITH FIRE ALARM VISUAL NOTIFICATION (SACO §907.5.2.3.4).
5. SURFACE MOUNT CONDUIT SHALL BE PAINTED TO MATCH EXISTING WALL COLORS.
6. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC, DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

SMOKE ALARM NOTES

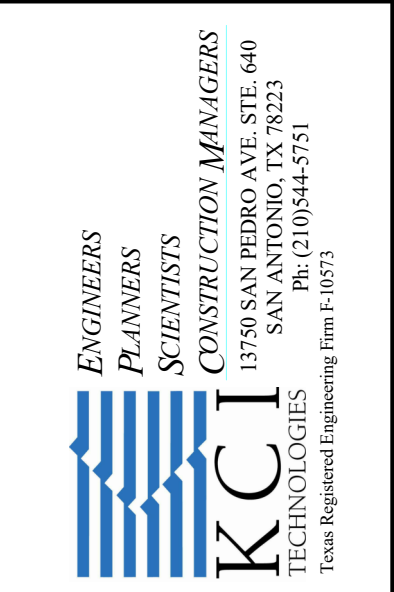
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2. 120-VOLT SMOKE ALARMS SHALL BE HARDWIRED WITH BATTERY BACKUP. DEVICES WITHIN A SINGLE DWELLING UNIT SHALL BE INTERCONNECTED SUCH THAT ANY INDIVIDUAL ALARM ACTIVATES ALL ALARMS WITHIN THE DWELLING UNIT.
3. PROVIDE 120-VOLT SMOKE ALARM DEVICES WITHIN EACH SLEEPING ROOM IN A DWELLING UNIT AND ANOTHER IN THE IMMEDIATE VICINITY OF THE BEDROOM(S) AS ILLUSTRATED.
4. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 3- FEET OF BATHROOM DOORS.
5. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 6- FEET OF A PERMANENTLY INSTALLED COOKING APPLIANCE.

KEYNOTE LEGEND

#	NOTE
1	PROVIDE 2 MONITOR MODULES FOR SPRINKLER ZONE CONTROL ASSEMBLY WATER FLOW SWITCH AND TAMPER SWITCH.
2	PROVIDE SMOKE DETECTOR IN HIGHER CEILING AREAS ON CEILING TILES.

No.	Description	Date
ISSUE FOR BID		08/17/18



FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
 SAN ANTONIO HOUSING AUTHORITY
 1215 FAIR AVENUE
 SAN ANTONIO, TEXAS



M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE ALARM LEVEL 1 OFFICES AND COMMUNITY ROOM

ADS LEGEND

-  INTELLIGIBILITY NOT REQUIRED
-  INTELLIGIBILITY REQUIRED

BUILDING FIRE ALARM NOTES

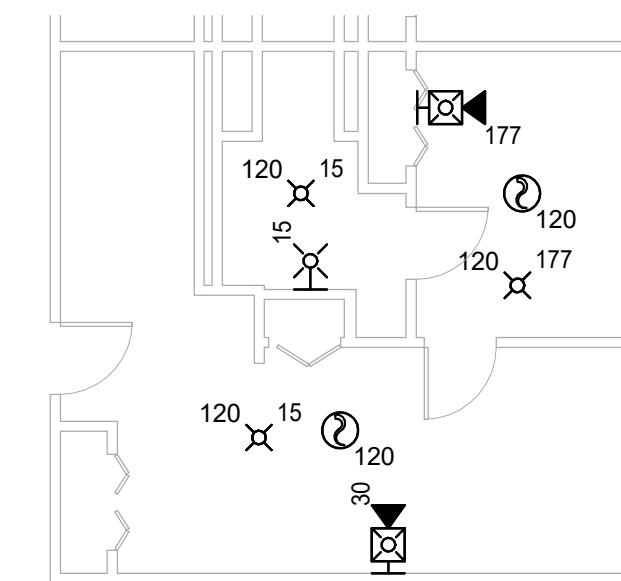
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2. PROVIDE DEDICATED FIRE ALARM STROBE DEVICES FOR NOTIFICATION OF BUILDING FIRE ALARM ACTIVATION IN EACH ROOM (INCLUDING RESTROOMS) OF AN ACCESSIBLE UNIT AS ILLUSTRATED. UNOCCUPIED PANTRIES, CLOSETS, AND SIMILAR LOCATIONS DO NOT REQUIRE VISUAL COVERAGE.
3. INTELLIGIBILITY (I.E., A CIS OF 0.7 OR GREATER) IS REQUIRED IN ALL CORRIDORS AND COMMON AREAS AS INDICATED ON DRAWINGS. INTELLIGIBILITY IS NOT REQUIRED WITHIN DWELLING UNITS OR BACK OF HOUSE SPACES.
4. CIRCUIT REQUIREMENTS: ALL FIRE ALARM WIRING, BOTH CONCEALED AND EXPOSED, SHALL BE PROVIDED IN METALLIC RACEWAY.
5. ALL DWELLING UNIT LIVING ROOMS SHALL BE PROVIDED WITH FIRE ALARM VISUAL NOTIFICATION (SACO §907.5.2.3.4).
6. SURFACE MOUNT CONDUIT SHALL BE PAINTED TO MATCH EXISTING WALL COLORS.
7. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

SMOKE ALARM NOTES

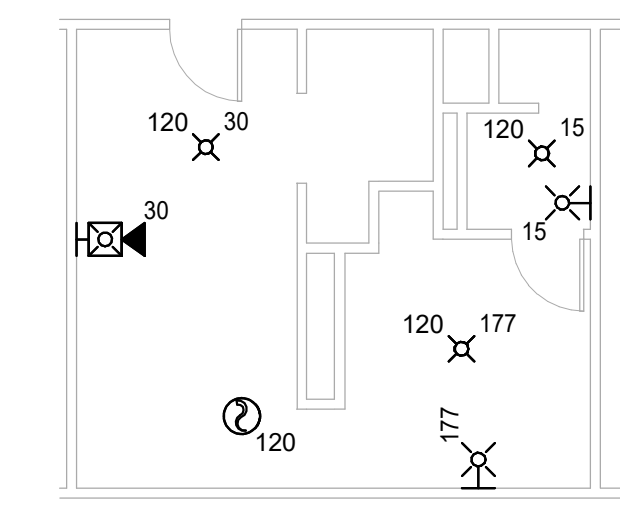
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2. 120-VOLT SMOKE ALARMS SHALL BE HARDWIRED WITH BATTERY BACKUP. DEVICES WITHIN A SINGLE DWELLING UNIT SHALL BE INTERCONNECTED SUCH THAT ANY INDIVIDUAL ALARM ACTIVATES ALL ALARMS WITHIN THE DWELLING UNIT.
3. PROVIDE 120-VOLT SMOKE ALARM DEVICES WITHIN EACH SLEEPING ROOM IN A DWELLING UNIT AND ANOTHER IN THE IMMEDIATE VICINITY OF THE BEDROOM AS ILLUSTRATED.
4. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 3- FEET OF BATHROOM DOORS.
5. CONTRACTOR SHALL NOT LOCATE 120-VOLT SMOKE ALARMS WITHIN 6- FEET OF A PERMANENTLY INSTALLED COOKING APPLIANCE.
6. PROVIDE 120-VOLT DEDICATED STROBE DEVICES FOR NOTIFICATION OF SMOKE ALARM ACTIVATION IN EACH ROOM (INCLUDING RESTROOMS) OF ACCESSIBLE UNITS AS ILLUSTRATED. UNOCCUPIED PANTRIES, CLOSETS, AND SIMILAR LOCATIONS DO NOT REQUIRE VISUAL COVERAGE. NOTE THAT THESE DEVICES ARE INDEPENDENT OF BUILDING FIRE ALARM STROBE DEVICES.

KEYNOTE LEGEND

#	NOTE
1	PROVIDE 2 MONITOR MODULES FOR SPRINKLER ZONE CONTROL ASSEMBLY WATER FLOW SWITCH AND TAMPER SWITCH. TYPICAL ON ALL LEVELS IN NORTH AND SOUTH STAIRWELLS.
2	PROVIDE SMOKE DETECTOR FOR THE PURPOSES OF ELEVATOR RECALL.
3	PROVIDE HEAT DETECTOR WITH LOWER RTI THAN SPRINKLER FOR ELEVATOR POWER SHUNTING. PROVIDE ONE HEAT DETECTOR WITH 2-FT OF EACH SPRINKLER.
4	ON LEVEL 11 ONLY, PROVIDE MONITOR MODULES FOR THE FLOW SWITCH AND TAMPER SWITCH FOR ZONE CONTROL ASSEMBLY SERVING THE ELEVATOR MACHINE ROOM ABOVE.
5	PROVIDE SMOKE DETECTOR AT TOP OF STAIRWELL ONLY.
6	PROVIDE NOTIFICATION APPLIANCE CIRCUIT EXTENDER PANELS AND VOICE AMPLIFICATION PANELS ON SELECT FLOORS AS NECESSARY.
7	PROVIDE AUDIO DEVICE ON LEVELS 1, 3, 5, 7, 9, AND 11 WITHIN THE STAIRWELL.



NOTE: TYPICAL OF UNITS #215 AND #704



NOTE: TYPICAL OF UNITS #303, #501, AND #803.

1 FIRE ALARM LEVEL 11 FLOOR PLAN
1/8" = 1'-0"

2 1-BEDROOM HEARING ACCESSIBLE FIRE ALARM PLAN
1/8" = 1'-0"

3 EFFICIENCY HEARING ACCESSIBLE FIRE ALARM FLOOR PLAN
1/8" = 1'-0"

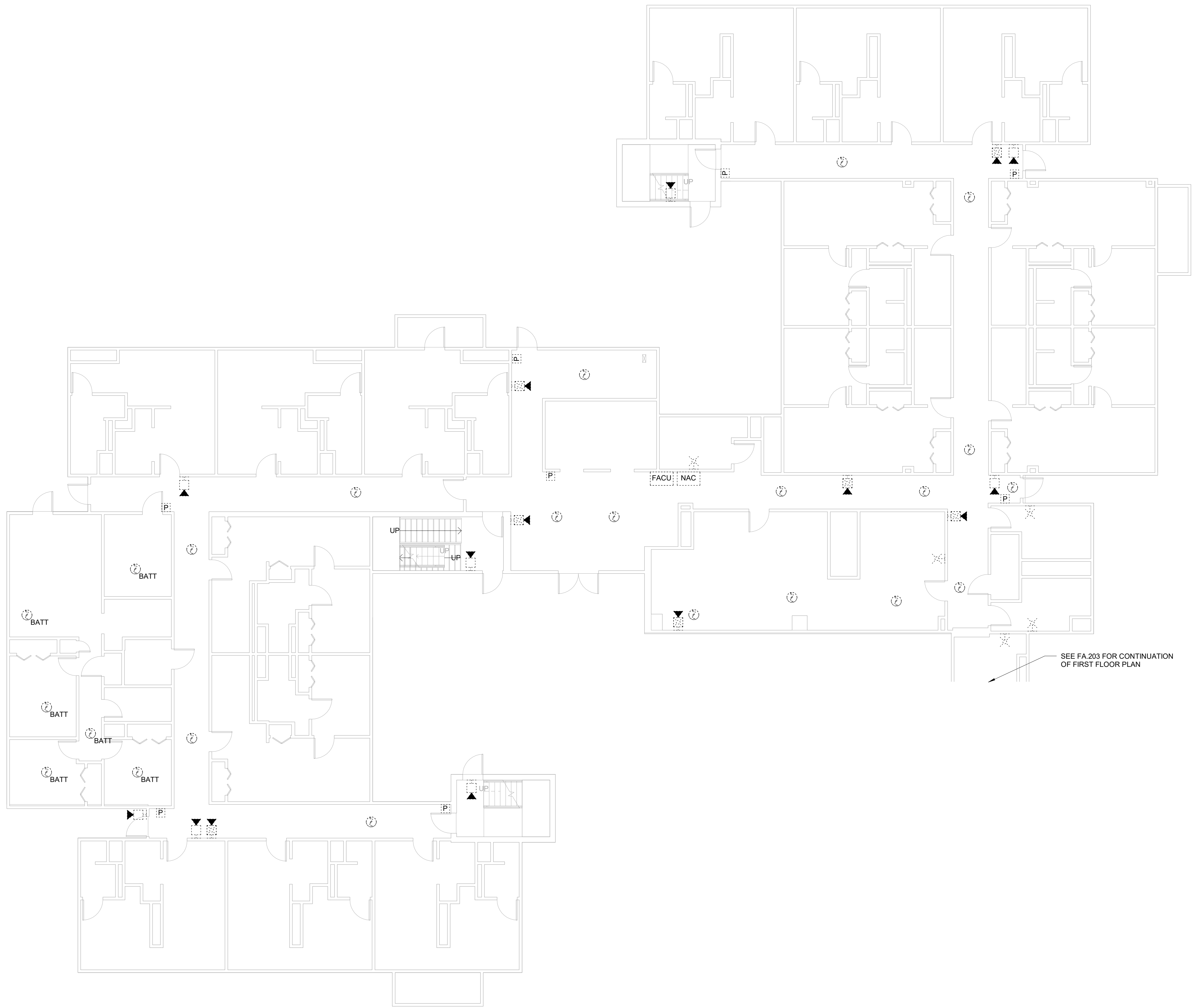
No.	Description	Date
ISSUE FOR BID		08/17/18

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
SAN ANTONIO HOUSING AUTHORITY
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M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE ALARM LEVELS 2-11 FLOOR PLAN



DRAWING NOTES

1. FOLLOWING COMMISSIONING AND ACCEPTANCE OF NEW EQUIPMENT, REMOVE NOT-IN-SERVICE PLACARDS FROM NEW EQUIPMENT AND PROVIDE NOT-IN-SERVICE PLACARDS ON ALL EXISTING EQUIPMENT UNTIL IT IS DEMOLISHED. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF INTERIOR FINISHES TO MATCH THAT OF THE SURROUNDINGS. INTERIOR FINISH RESTORATIONS ARE LIMITED TO DRYWALL REPAIR AND PAINTING. OWNER TO PROVIDE PAINT COLOR SPECIFICATIONS FOR EACH SPACE.
2. DEMOLISH ALL EXISTING FIRE ALARM EQUIPMENT, INCLUDING ACCESSIBLE RACEWAY AND WIRING. RESTORE VISIBLE INTERIOR FINISHES TO MATCH EXISTING, INCLUDING NECESSARY PATCH AND PAINT WORK. QUANTITIES AND TYPES OF DEVICES ARE ESTIMATED; ALL EXISTING FIRE ALARM EQUIPMENT SHALL BE DEMOLISHED.
3. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

① FIRE ALARM LEVEL 1 DEMOLITION FLOOR PLAN
1/8" = 1'-0"

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FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
 SAN ANTONIO HOUSING AUTHORITY
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M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
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SHEET DATE 08/17/2018
FIRE ALARM LEVEL 1 DEMOLITION FLOOR PLAN

FA.202

No.	Description	Date
		08/17/18

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS

SAN ANTONIO HOUSING AUTHORITY
1215 FAIR AVENUE
SAN ANTONIO, TEXAS

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2018-08-17

PROJECT NUMBER
7917053.00

DRAWN BY
M. PRICE

CHECKED BY
M. HULCHER

SHEET DATE
08/17/2018

FIRE PROTECTION BASEMENT FLOOR PLAN

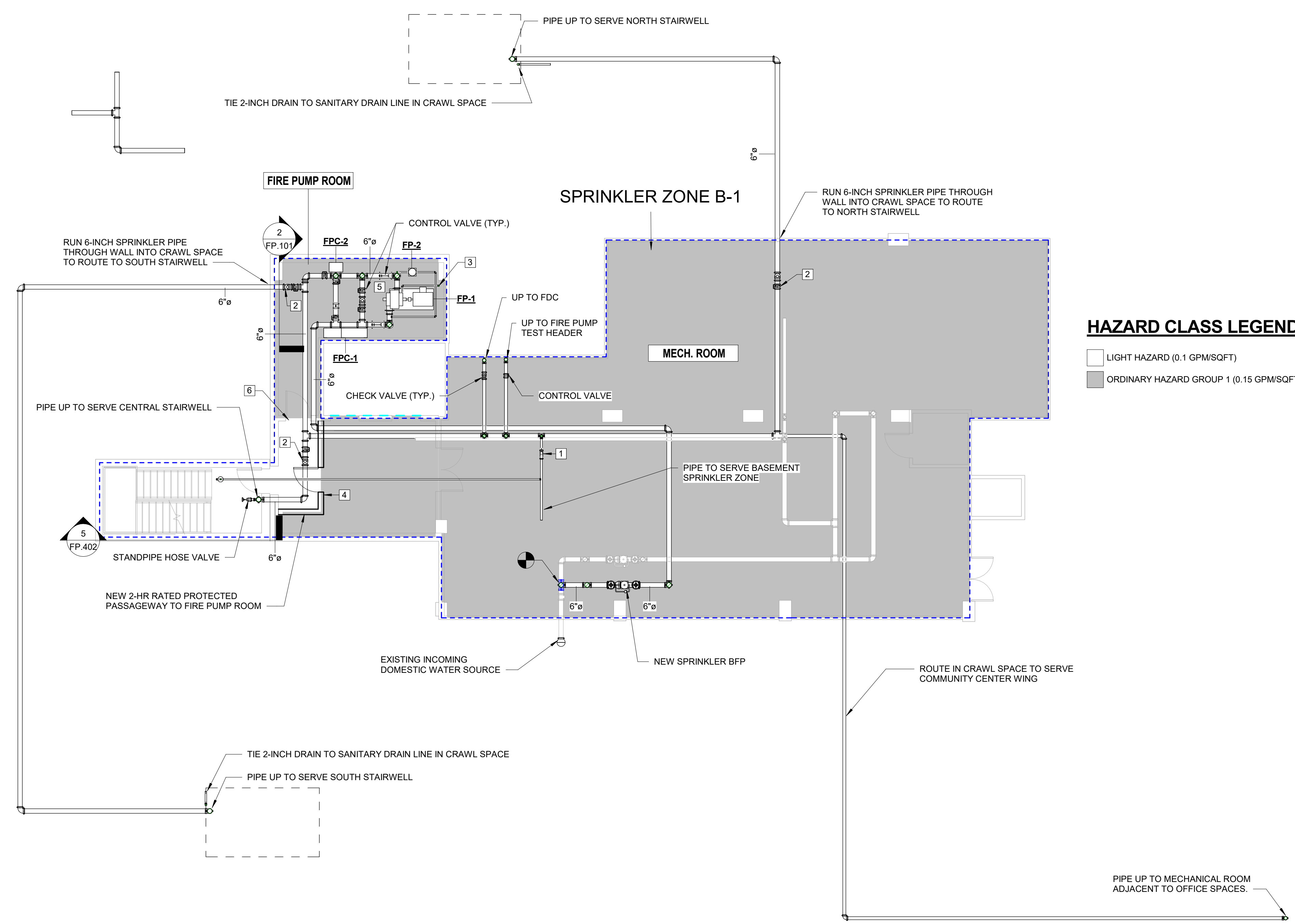
FP.101

GENERAL NOTES

- DRAWINGS INDICATE ROUTING OF SPRINKLER/STANDPIPE MAINS AND SOME BRANCLINES TO ILLUSTRATE CONCEPTS. FINAL ROUTING AND LAYOUT SHALL BE DEVELOPED BY THE CONTRACTOR DURING SHOP DRAWING DESIGN.
- PROVIDED 1-1/2-INCH HOSE VALVE REDUCER CAP CHAINED TO EACH 2-1/2-INCH HOSE VALVE.
- PROVIDE PRESSURE REDUCING VALVE BEFORE EACH STANDPIPE HOSE VALVE TO 175 PSI OR LESS WITHOUT REDUCING BELOW HYDRAULICALLY CALCULATED PRESSURE REQUIREMENTS.
- PIPE RUNS LOCATED OUTSIDE THE BASEMENT WALLS ARE ROUTED WITHIN CRAWL SPACES.
- CRAWL SPACES AND STAIRWELLS ARE NOT HEATED. NO INSULATION NOR OTHER SPECIAL TREATMENT OF BULK WET MAINS AND RISERS IS REQUIRED.
- LABEL ALL SPRINKLER AND STANDPIPE PIPING 2.5-INCHES OR GREATER IN DIAMETER WITH LABELS AND FLOW DIRECTION ARROWS EVERY 20-FEET OF PIPING.
- SPRINKLER PIPING ROUTED IN UNHEATED CRAWL SPACES SHALL BE PROVIDED WITH MINIMUM 3-INCHES OF FOAMGLAS INSULATION WITH ALL SERVICE JACKET TO ACHIEVE NFPA 13 COMPLIANT FREEZE PROTECTION.
- HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

HAZARD CLASS LEGEND

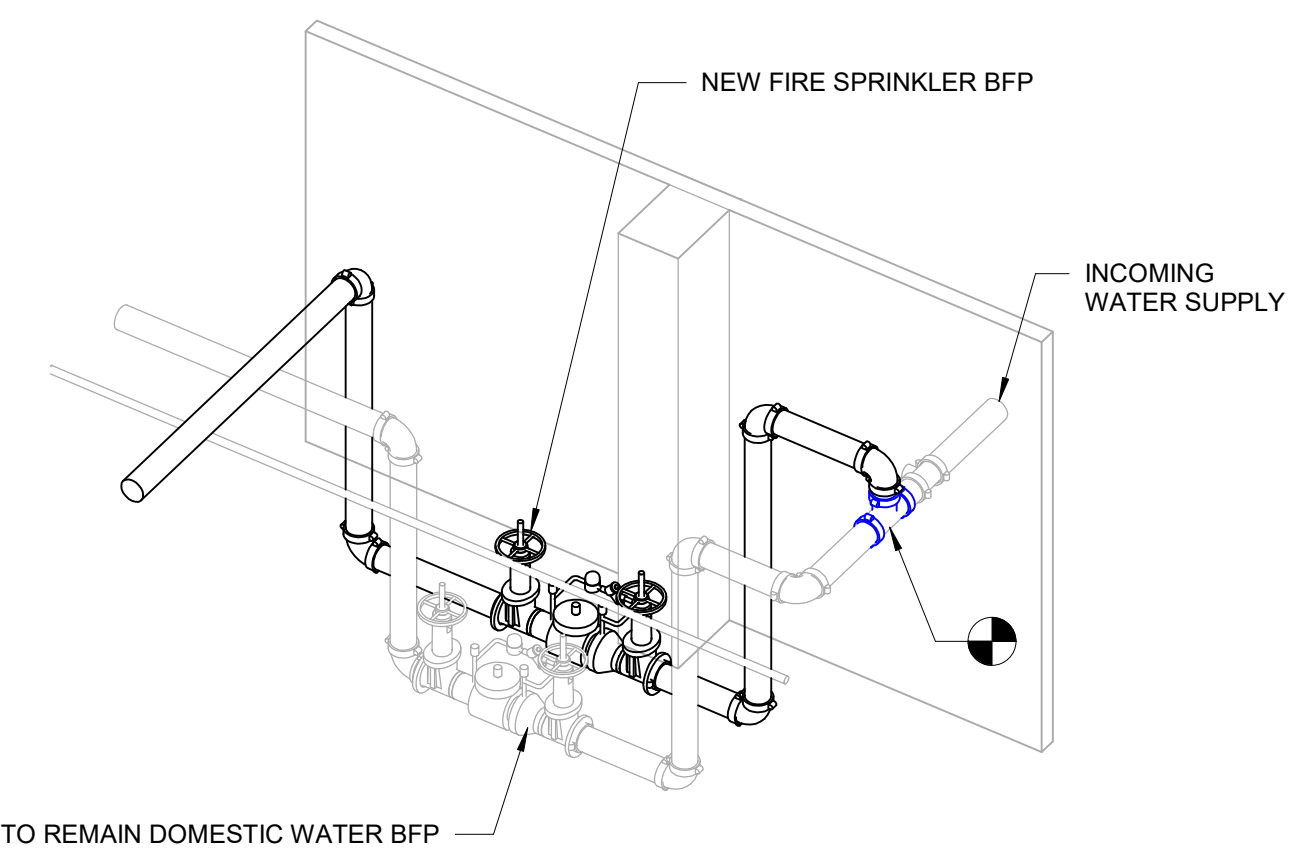
- LIGHT HAZARD (0.1 GPM/SQFT)
- ORDINARY HAZARD GROUP 1 (0.15 GPM/SQFT)



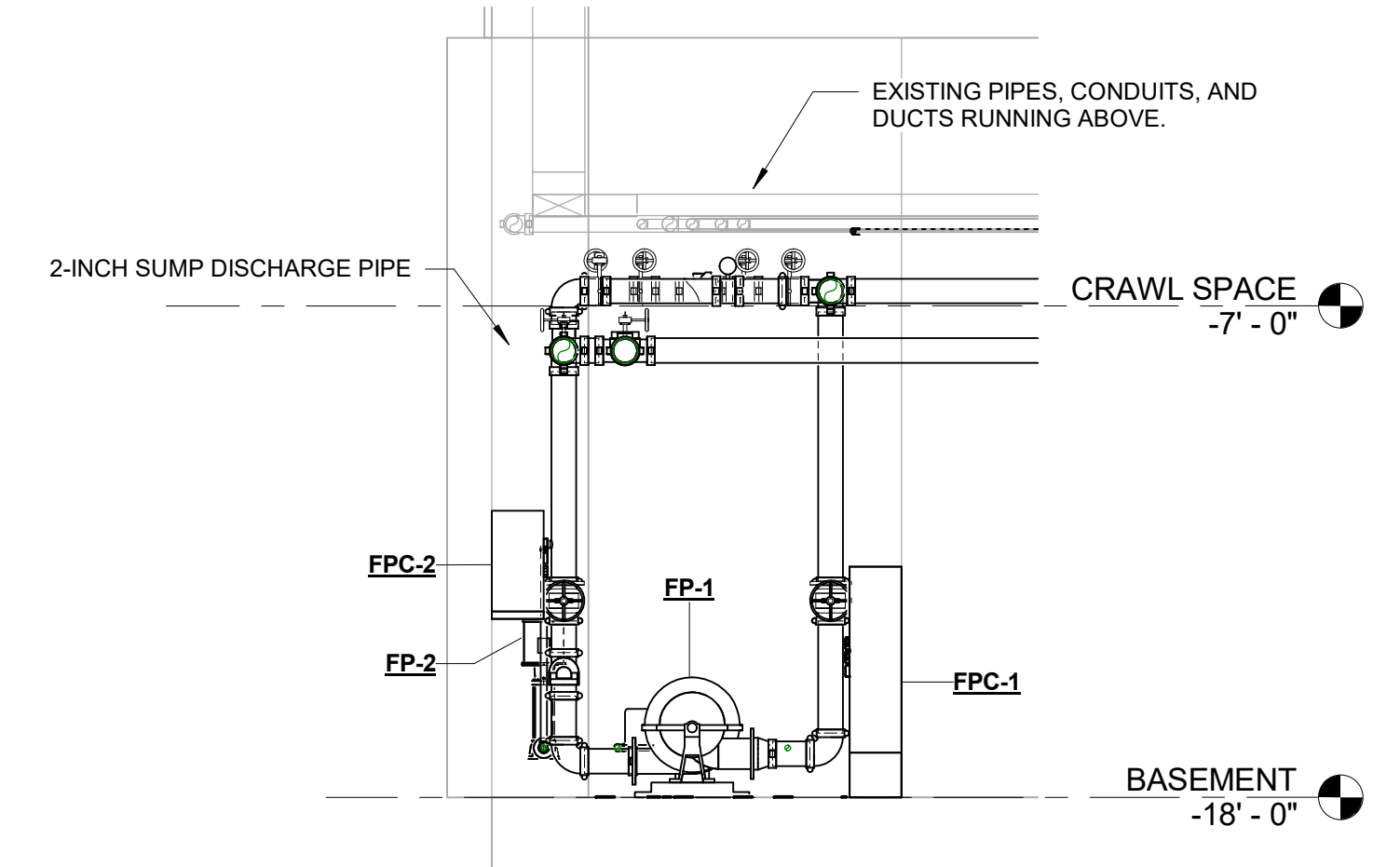
1 FIRE PROTECTION BASEMENT FLOOR PLAN
1/8" = 1'-0"

#	NOTE
1	PROVIDE ZONE CONTROL ASSEMBLY INCLUDING A CHECK VALVE, FLOW SWITCH, TEST AND DRAIN ASSEMBLY, AND CONTROL VALVE. TIE DRAIN LINE INTO 2-INCH DRAIN RISER.
2	PROVIDE CONTROL VALVE AND CHECK VALVE FOR STANDPIPE ZONE.
3	ROUTE FIRE PUMP DRAINS TO FLOOR DRAIN LOCATED BEHIND PUMP.
4	NEW 2-HOUR RATED EXIT ACCESS CORRIDOR.
5	PROVIDE SIGHT GLASS FOR VISUAL FLOW INDICATION ON THE DISCHARGE SIDE OF THE FIRE PUMP WITHIN THE FLOW METER LOOP.
6	PROVIDE SIGN ON DOOR WITH THE TEXT "FIRE PUMP ROOM."

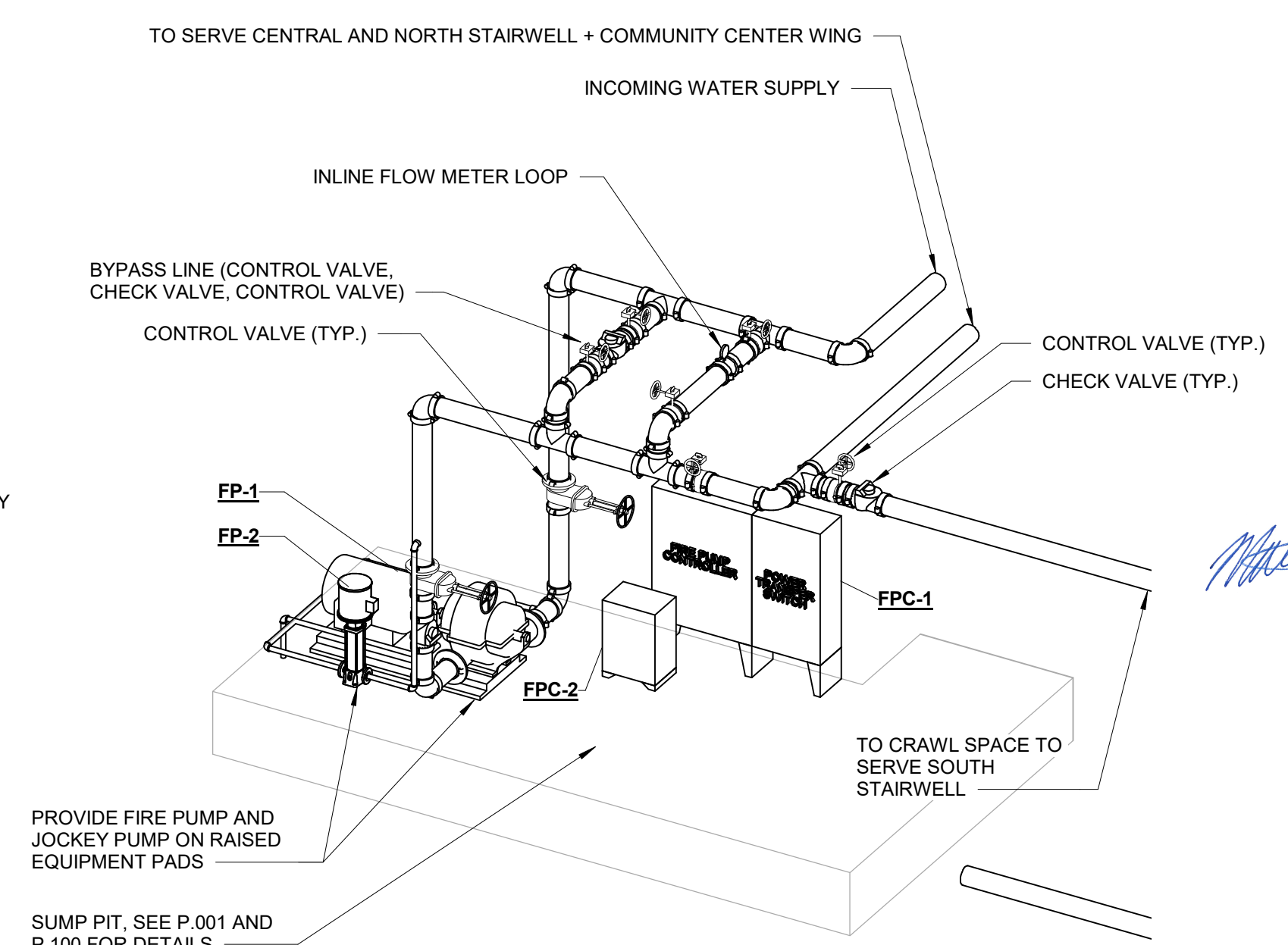
KEYNOTE LEGEND



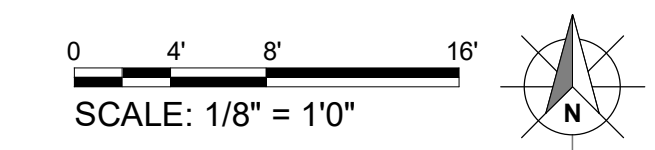
4 FIRE SPRINKLER BACKFLOW PREVENTER ISOMETRIC



2 FIRE PUMP SECTION
1/4" = 1'-0"

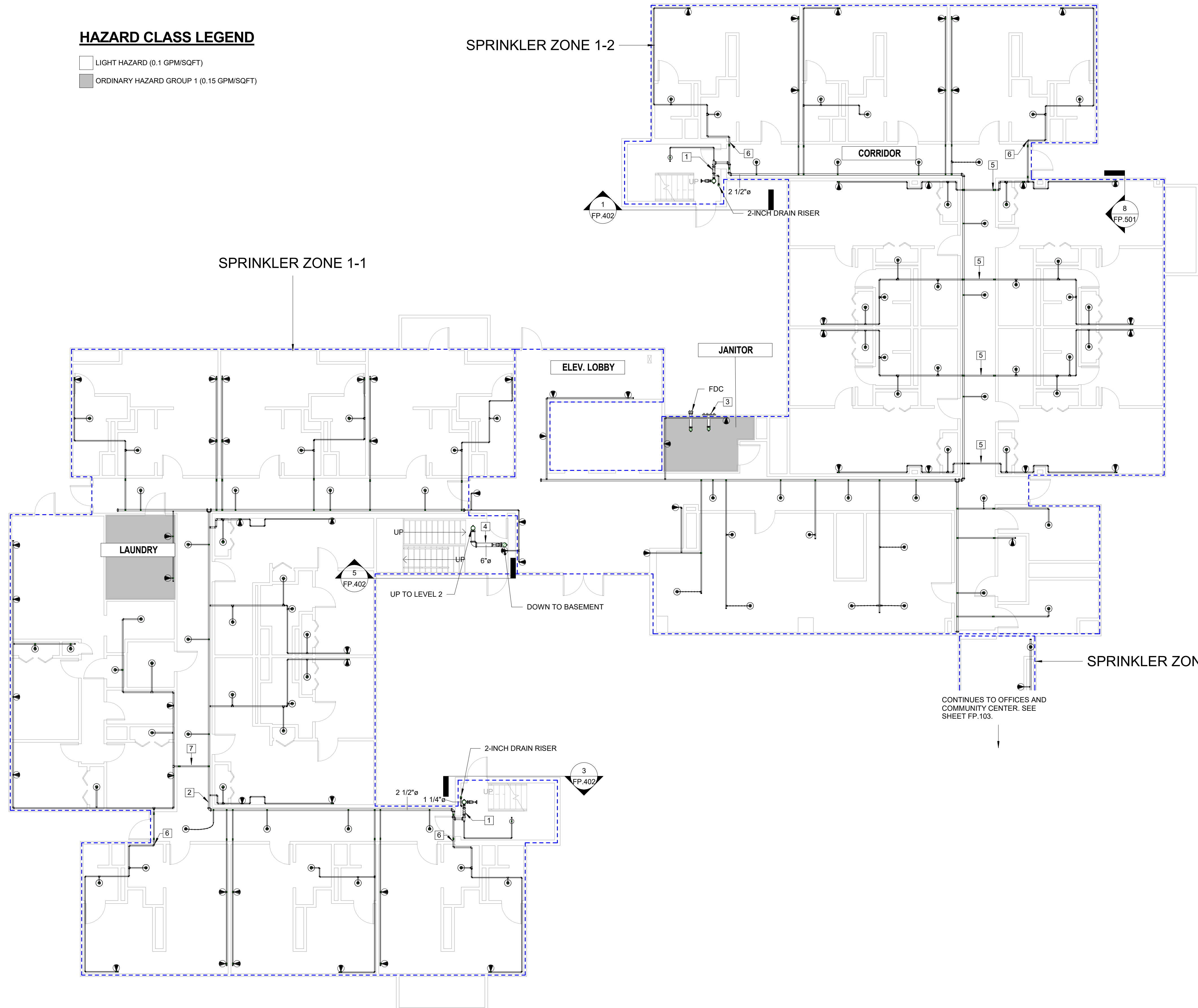


3 FIRE PUMP ROOM ISOMETRIC



HAZARD CLASS LEGEND

- LIGHT HAZARD (0.1 GPM/SQFT)
- ORDINARY HAZARD GROUP 1 (0.15 GPM/SQFT)



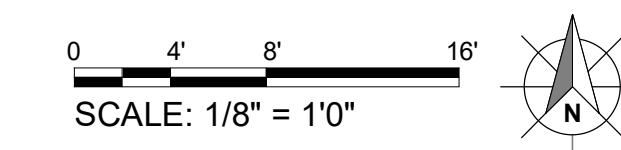
GENERAL NOTES

1. DRAWINGS INDICATE ROUTING OF SPRINKLER/STANDPIPE MAINS AND BRANCHLINES TO ILLUSTRATE CONCEPTS. FINAL ROUTING AND LAYOUT SHALL BE DEVELOPED BY THE CONTRACTOR DURING SHOP DRAWING DESIGN.
2. SPRINKLER PIPING IN RESIDENTIAL CORRIDORS SHALL BE RUN EXPOSED UNDERNEATH CEILING TILES WHERE A SUSPENDED CEILING IS PRESENT.
3. THE USE OF FLEXIBLE PIPE SPRINKLER CONNECTIONS IS PERMITTED WITH HYDRAULIC CALCULATIONS TO SUPPORT THEIR USE.
4. PROVIDE 1-1/2-INCH HOSE VALVE REDUCER CAP CHAINED TO EACH 2-1/2-INCH HOSE VALVE.
5. PROVIDE PRESSURE REDUCING VALVE BEFORE EACH STANDPIPE HOSE VALVE TO 175 PSI OR LESS WITHOUT REDUCING BELOW HYDRAULICALLY CALCULATED PRESSURE REQUIREMENTS.
6. PIPING IN DWELLING UNITS SHALL BE EXPOSED. ROUTE PIPING AS CLOSE AS POSSIBLE TO EXISTING DRYWALL CEILING AND CORNERS.
7. INSTALL MANUAL, MINIMUM 1/2-INCH VALVE FOR AIR VENTING AT THE END OF EACH SPRINKLER ZONE.
8. SECURE ALL CONTROL VALVES IN SPACES OPEN TO BUILDING RESIDENTS WITH A LOCK IN THE OPEN POSITION TO PREVENT TAMPERING. USE STANDARD KEY FOR ALL LOCKS; PROVIDE KEY TO LOCKS IN KNOX BOX.
9. LABEL ALL SPRINKLER AND STANDPIPE PIPING 2.5-INCHES OR GREATER IN DIAMETER WITH LABELS AND FLOW DIRECTION ARROWS EVERY 20-FOOT OF PIPING.
10. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

KEYNOTE LEGEND

#	NOTE
1	PROVIDE ZONE CONTROL ASSEMBLY INCLUDING A CHECK VALVE, FLOW SWITCH, TEST AND DRAIN ASSEMBLY, AND CONTROL VALVE. TIE DRAIN LINE INTO 2-INCH DRAIN RISER.
2	RUN 2 1/2-INCH SPRINKLER LINE AT 7'-5" AFF TO BOP TO ROUTE UNDERNEATH CONCRETE BEAMS.
3	PROVIDE FIRE TEST HEADER WITH FOUR (4) 2 1/2-INCH HOSE CONNECTIONS.
4	JOG 6-INCH MAIN ALONG CEILING TO RISE TO SECOND FLOOR TO ACCOMMODATE STAIRWELL WIDTH REDUCTION.
5	RUN PIPE AS CLOSE TO THE CEILING DECK AS POSSIBLE. ADJUST CEILING GRID AROUND PIPE TO ENCLOSE PIPE WITHIN CEILING TILE.
6	REDUCE SIZE OF THE FAN COIL UNIT RETURN BOOT LOCATED ABOVE KITCHEN TO ALLOW SUFFICIENT ROOM FOR 1 1/4-INCH SPRINKLER PIPE TO ROUTE BEHIND DUCTWORK TO SERVE UNIT SPRINKLERS.
7	RUN PIPE ACROSS HALLWAY AS CLOSE TO STRUCTURAL CEILING AS POSSIBLE. PROVIDE SOFFIT AROUND PIPE AS IT CROSSES THE HALLWAY. ADJUST CEILING TILES TO FIT SOFFIT.

① FIRE PROTECTION LEVEL 1
1/8" = 1'-0"



No.	Description	Date
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FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
 SAN ANTONIO HOUSING AUTHORITY
 1215 FAIR AVENUE
 SAN ANTONIO, TEXAS

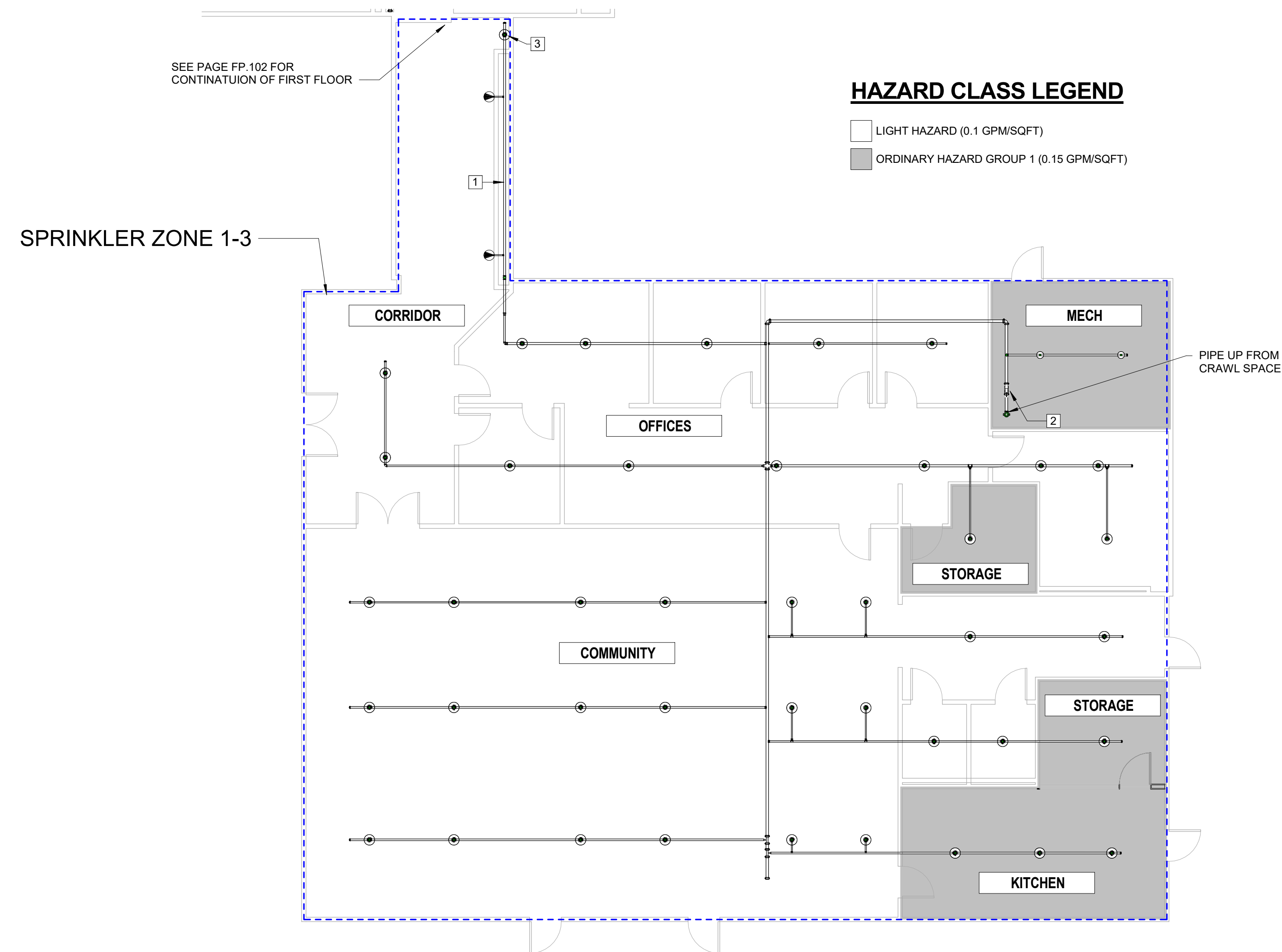
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M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE PROTECTION LEVEL 1 FLOOR PLAN

FP.102

No.	Description	Date
	ISSUE FOR BID	08/17/18



GENERAL NOTES

- DRAWINGS INDICATE ROUTING OF SPRINKLER/STANDPIPE MAINS AND BRANCHLINES TO ILLUSTRATE CONCEPTS. FINAL ROUTING AND LAYOUT SHALL BE DEVELOPED BY THE CONTRACTOR DURING SHOP DRAWING DESIGN.
- SPRINKLER PIPING IN RESIDENTIAL CORRIDORS SHALL BE RUN EXPOSED UNDERNEATH CEILING TILES WHERE A SUSPENDED CEILING IS PRESENT.
- THE USE OF FLEXIBLE PIPE SPRINKLER CONNECTIONS IS PERMITTED WITH HYDRAULIC CALCULATIONS TO SUPPORT THEIR USE.
- PROVIDE 1-1/2-INCH HOSE VALVE REDUCER CAP CHAINED TO EACH 2-1/2-INCH HOSE VALVE.
- PROVIDE PRESSURE REDUCING VALVE BEFORE EACH STANDPIPE HOSE VALVE TO 175 PSI OR LESS WITHOUT REDUCING BELOW HYDRAULICALLY CALCULATED PRESSURE REQUIREMENTS.
- PIPING IN DWELLING UNITS SHALL BE EXPOSED. ROUTE PIPING AS CLOSE AS POSSIBLE TO EXISTING DRYWALL CEILINGS AND CORNERS.
- INSTALL MANUAL, MINIMUM 1/2-INCH VALVE FOR AIR VENTING AT THE END OF EACH SPRINKLER ZONE.
- SECURE ALL CONTROL VALVES IN SPACES OPEN TO BUILDING RESIDENTS WITH A LOCK IN THE OPEN POSITION TO PREVENT TAMPERING. USE STANDARD KEY FOR ALL LOCKS; PROVIDE KEY TO LOCKS IN KNOX BOX.
- LABEL ALL SPRINKLER AND STANDPIPE PIPING 2.5-INCHES OR GREATER IN DIAMETER WITH LABELS AND FLOW DIRECTION ARROWS EVERY 20-FEET OF PIPING.
- HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

KEYNOTE LEGEND

#	NOTE
1	RUN PIPE IN BEHIND DRYWALL ABOVE MAILBOXES. PROTECT HALLWAY WITH SIDEWALL SPRINKLERS.
2	PROVIDE ZONE CONTROL ASSEMBLY INCLUDING CONTROL VALVE, TEST AND DRAIN ASSEMBLY, AND CHECK VALVE FOR SPRINKLER ZONE SERVING COMMUNITY CENTER AND OFFICE SPACES.
3	PROVIDE PENDENT SPRINKLER WITH GUARD UNDERNEATH SOFFIT. PROVIDE AUXILIARY DRAIN AT END OF LINE.

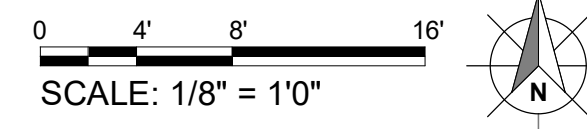
① FIRE PROTECTION LEVEL 1 OFFICES AND COMMUNITY CENTER
1/8" = 1'-0"

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
SAN ANTONIO HOUSING AUTHORITY
1215 FAIR AVENUE
SAN ANTONIO, TEXAS

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Ph: (210)544-5751
Texas Registered Engineering Firm # 11073

M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE PROTECTION LEVEL 1 OFFICES AND COMMUNITY ROOM



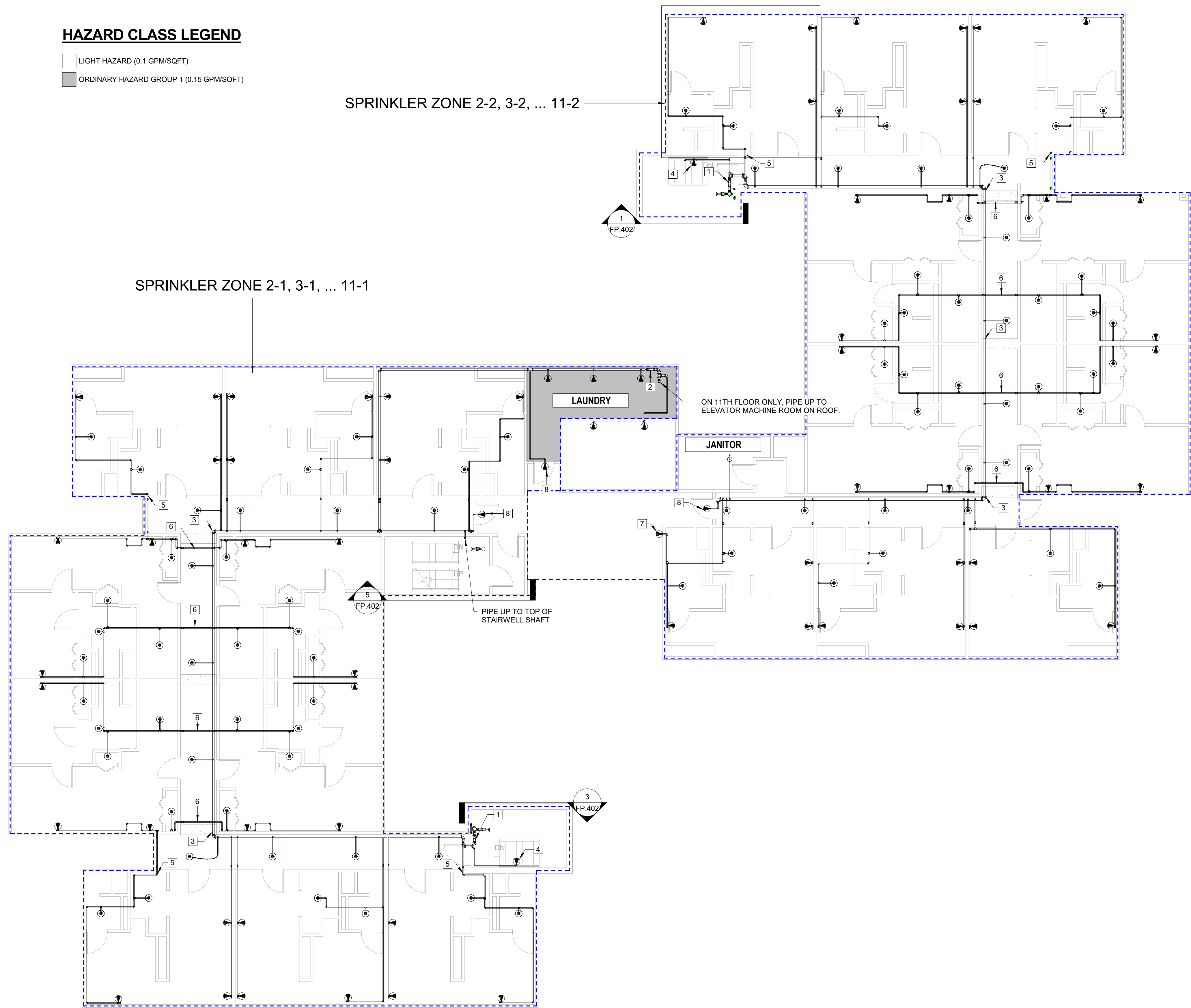
FP.103

HAZARD CLASS LEGEND

- LIGHT HAZARD (0.1 GPM/SQFT)
- ORDINARY HAZARD GROUP 1 (0.15 GPM/SQFT)

SPRINKLER ZONE 2-2, 3-2, ... 11-2

SPRINKLER ZONE 2-1, 3-1, ... 11-1



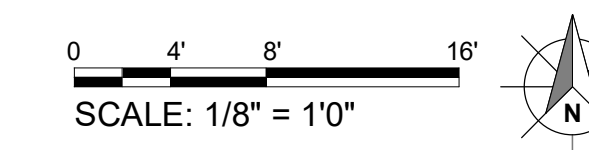
GENERAL NOTES

1. DRAWINGS INDICATE ROUTING OF SPRINKLER/STANDPIPE MAINS AND BRANCHLINES TO ILLUSTRATE CONCEPTS. FINAL ROUTING AND LAYOUT SHALL BE DEVELOPED BY THE CONTRACTOR DURING SHOP DRAWING DESIGN.
2. SPRINKLER PIPING IN RESIDENTIAL CORRIDORS SHALL BE RUN EXPOSED UNDERNEATH CEILINGS TILES WHERE A SUSPENDED CEILING IS PRESENT.
3. THE USE OF FLEXIBLE PIPE SPRINKLER CONNECTIONS IS PERMITTED WITH HYDRAULIC CALCULATIONS TO SUPPORT THEIR USE.
4. PROVIDE 1-1/2-INCH HOSE VALVE REDUCER CAP CHAINED TO EACH 2-1/2-INCH HOSE VALVE.
5. PROVIDE PRESSURE REDUCING VALVE BEFORE EACH STANDPIPE HOSE VALVE TO 175 PSI OR LESS WITHOUT REDUCING BELOW HYDRAULICALLY CALCULATED PRESSURE REQUIREMENTS.
6. PIPING IN DWELLING UNITS SHALL BE EXPOSED. ROUTE PIPING AS CLOSE AS POSSIBLE TO EXISTING DRYWALL CEILINGS AND CORNERS.
7. INSTALL MANUAL, MINIMUM 1/2-INCH VALVE FOR AIR VENTING AT THE END OF EACH SPRINKLER ZONE.
8. SECURE ALL CONTROL VALVES IN SPACES OPEN TO BUILDING RESIDENTS WITH A LOCK IN THE OPEN POSITION TO PREVENT TAMPERING. USE STANDARD KEY FOR ALL LOCKS; PROVIDE KEY TO LOCKS IN KNOX BOX.
9. LABEL ALL SPRINKLER AND STANDPIPE PIPING 2.5-INCHES OR GREATER IN DIAMETER WITH LABELS AND FLOW DIRECTION ARROWS EVERY 20-FOOT OF PIPING.
10. **HAZARDOUS MATERIALS:** VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

KEYNOTE LEGEND

#	NOTE
1	PROVIDE ZONE CONTROL ASSEMBLY INCLUDING A CHECK VALVE, FLOW SWITCH, TEST AND DRAIN ASSEMBLY, AND CONTROL VALVE. TIE DRAIN LINE INTO 2-INCH DRAIN RISER.
2	PROVIDE CONTROL VALVE, CHECK VALVE, AND FLOW SWITCH FOR PIPE ROUTING UP THROUGH LEVEL 11 CEILING INTO ELEVATOR MACHINE ROOM. THIS ADDITIONAL SPRINKLER ZONE ASSEMBLY IS NOT APPLICABLE TO FLOORS 2-10.
3	RUN 2 1/2-INCH SPRINKLER LINE AT 7'-5" AFF TO BOP TO ROUTE UNDERNEARTH CONCRETE BEAMS.
4	PROVIDE SPRINKLER AT THE TOP THE STAIRWELL ONLY.
5	REDUCE SIZE OF THE FAN COIL UNIT RETURN BOOT LOCATED ABOVE KITCHEN TO ALLOW SUFFICIENT ROOM FOR 1 1/4-INCH SPRINKLER PIPE TO ROUTE BEHIND DUCTWORK TO SERVE UNIT SPRINKLERS.
6	RUN PIPE ACROSS HALLWAY AS CLOSE TO STRUCTURAL CEILING AS POSSIBLE. PROVIDE SOFFIT AROUND PIPE AS IT CROSSES THE HALLWAY. ADJUST CEILING TILES TO FIT SOFFIT.
7	PROVIDE EXTENDED COVERAGE DRY HORIZONTAL SIDEWALL SPRINKLER WITH A THROW RANGE OF 20-FT. ENSURE EXPOSED BARREL LENGTH WITHIN THE HEATED SPACE OF THE BUILDING MEETS NFPA 13 TABLE 8.4.9.1(a) REQUIREMENTS.
8	PROVIDE DRY BARREL HORIZONTAL SIDEWALL SPRINKLER. ENSURE EXPOSED BARREL LENGTH WITHIN THE HEATED SPACE OF THE BUILDING MEETS NFPA 13 TABLE 8.4.9.1(a) REQUIREMENTS.

① FIRE PROTECTION LEVELS 2-11
1/8" = 1'-0"



No.	Description	Date
	ISSUE FOR BID	08/17/18

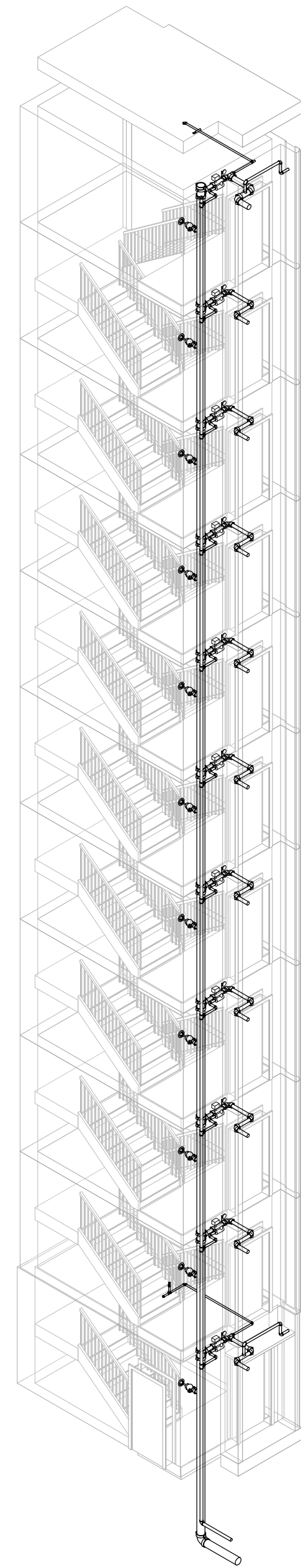
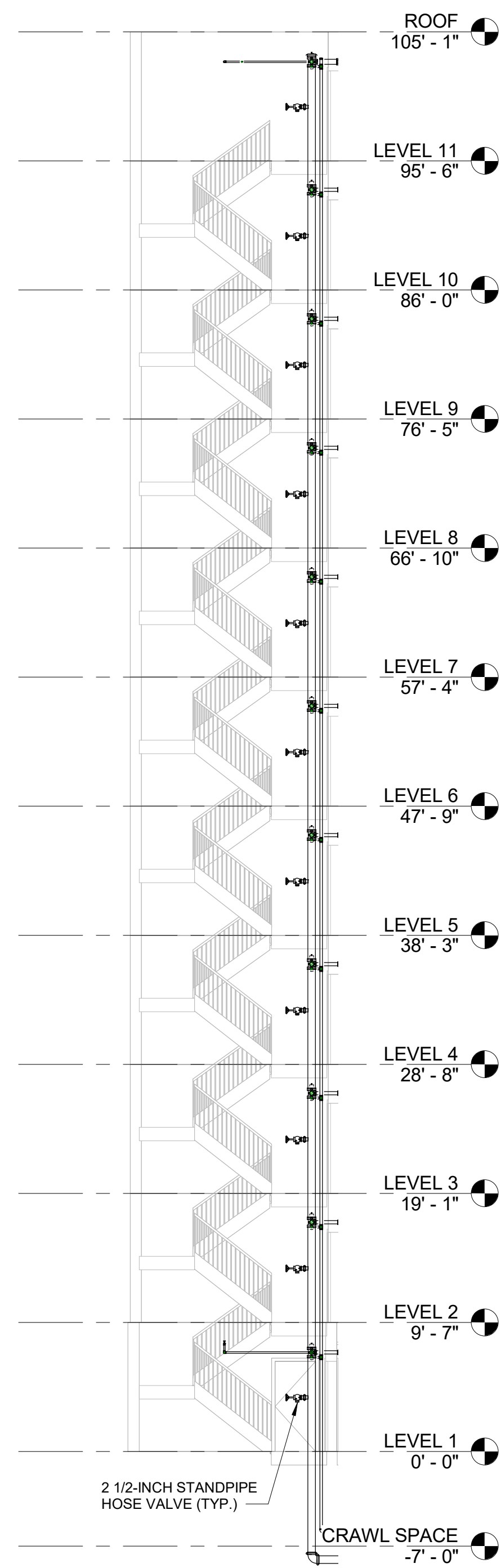
FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
 SAN ANTONIO HOUSING AUTHORITY
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 Fax: (210)544-5751
 Texas Registered Engineering Firm #10573

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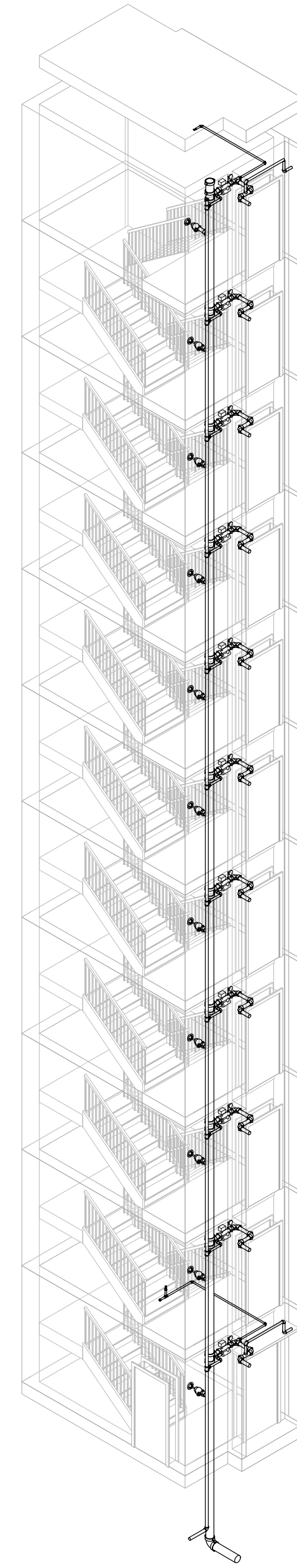
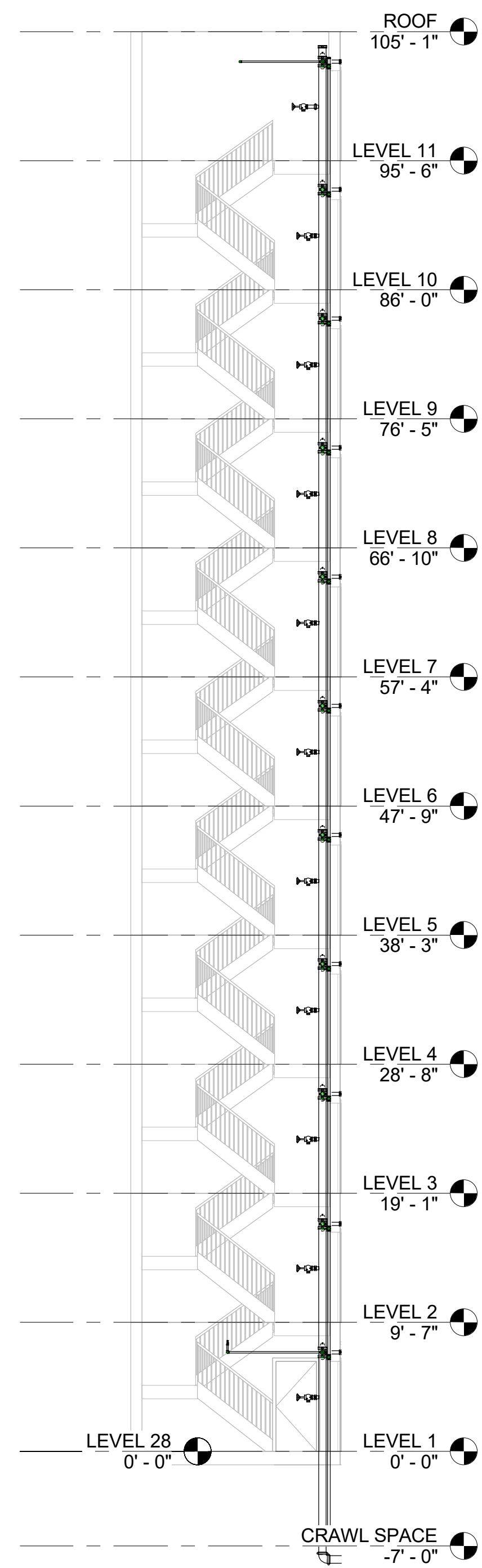
PROJECT NUMBER 7917053.00
DRAWN BY M. PRICE
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE PROTECTION LEVELS 2-11 FLOOR PLAN

FP.104



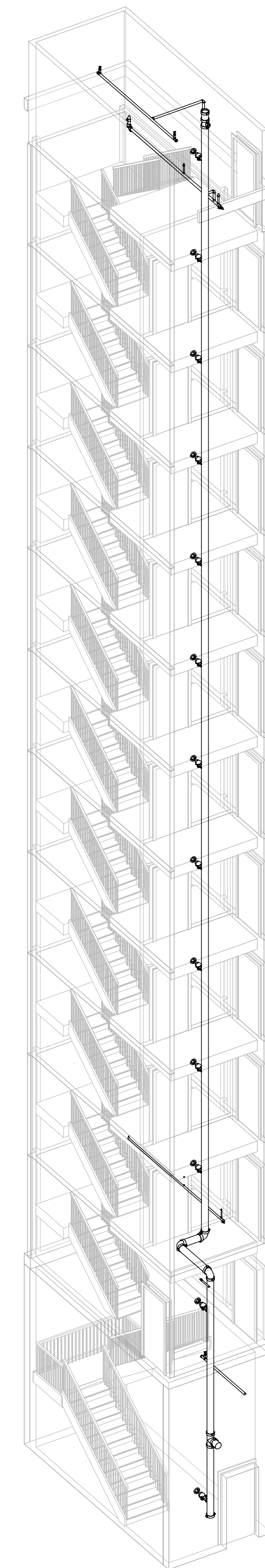
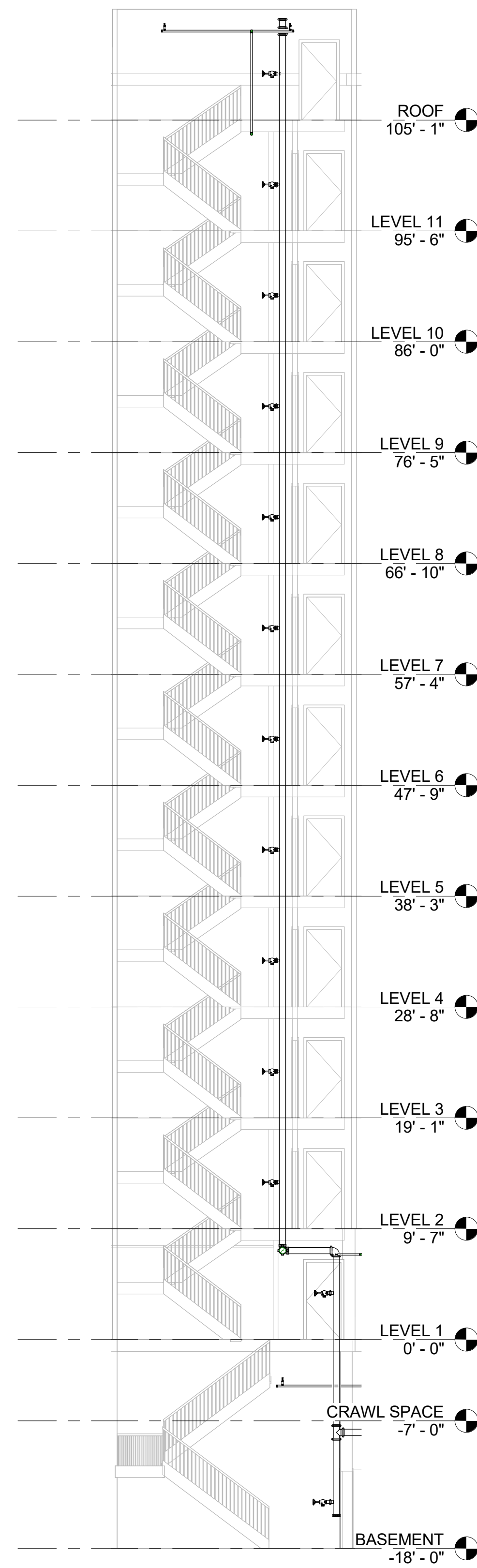
1 NORTH STAIRWELL ELEVATION
1/8" = 1'-0"

2 NORTH STAIRWELL ISOMETRIC



3 SOUTH STAIRWELL ELEVATION
1/8" = 1'-0"

4 SOUTH STAIRWELL ISOMETRIC



5 CENTRAL STAIRWELL ELEVATION
1/8" = 1'-0"

6 CENTRAL STAIRWELL ISOMETRIC

No.	Description	Date
	ISSUE FOR BID	08/17/18

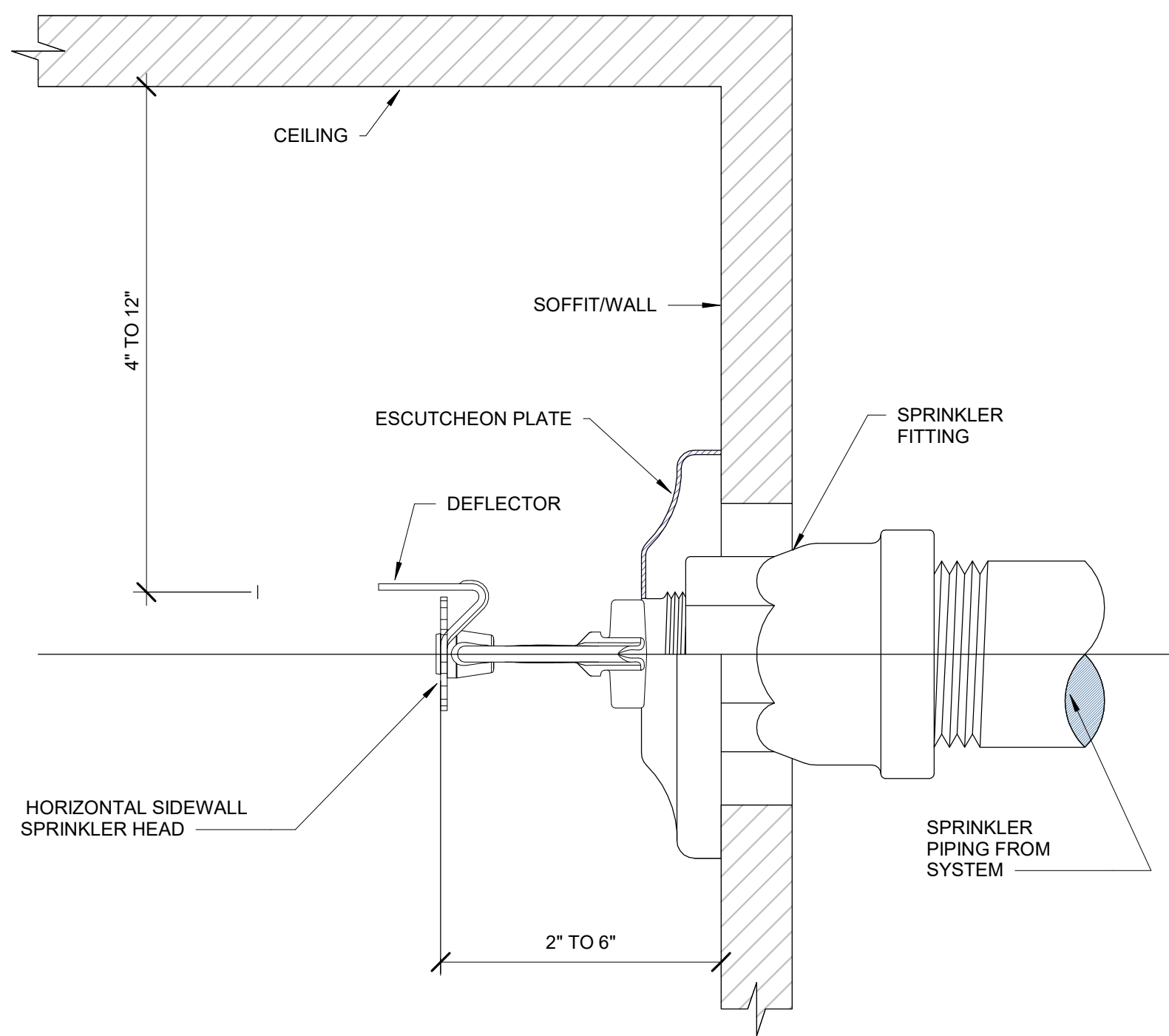
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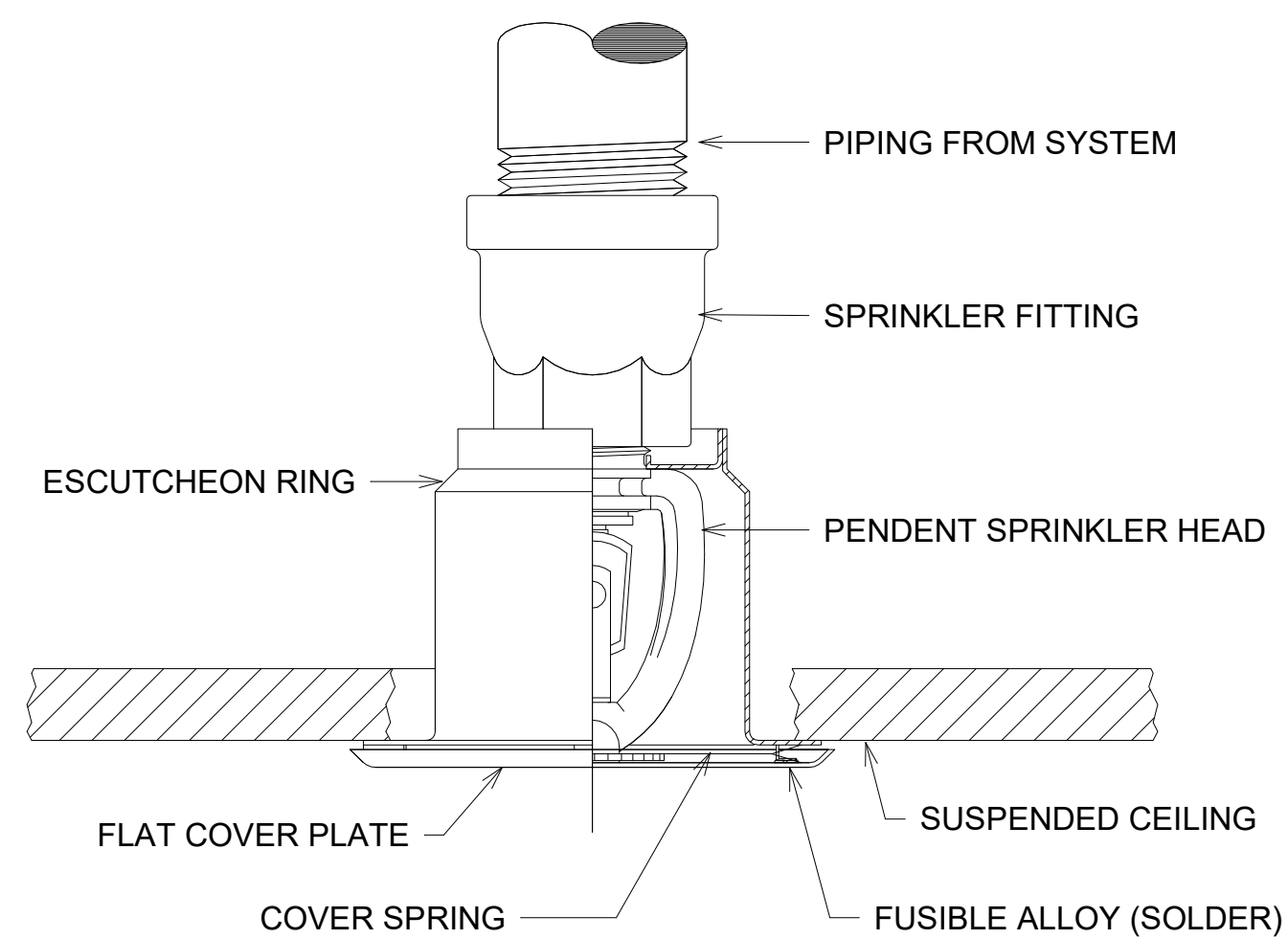
M. Hulcher 2018-08-17

PROJECT NUMBER 7917053.00
DRAWN BY B. OREM
CHECKED BY M. HULCHER
SHEET DATE 08/17/2018
FIRE PROTECTION STAIRWELL ISOMETRICS AND ELEVATIONS

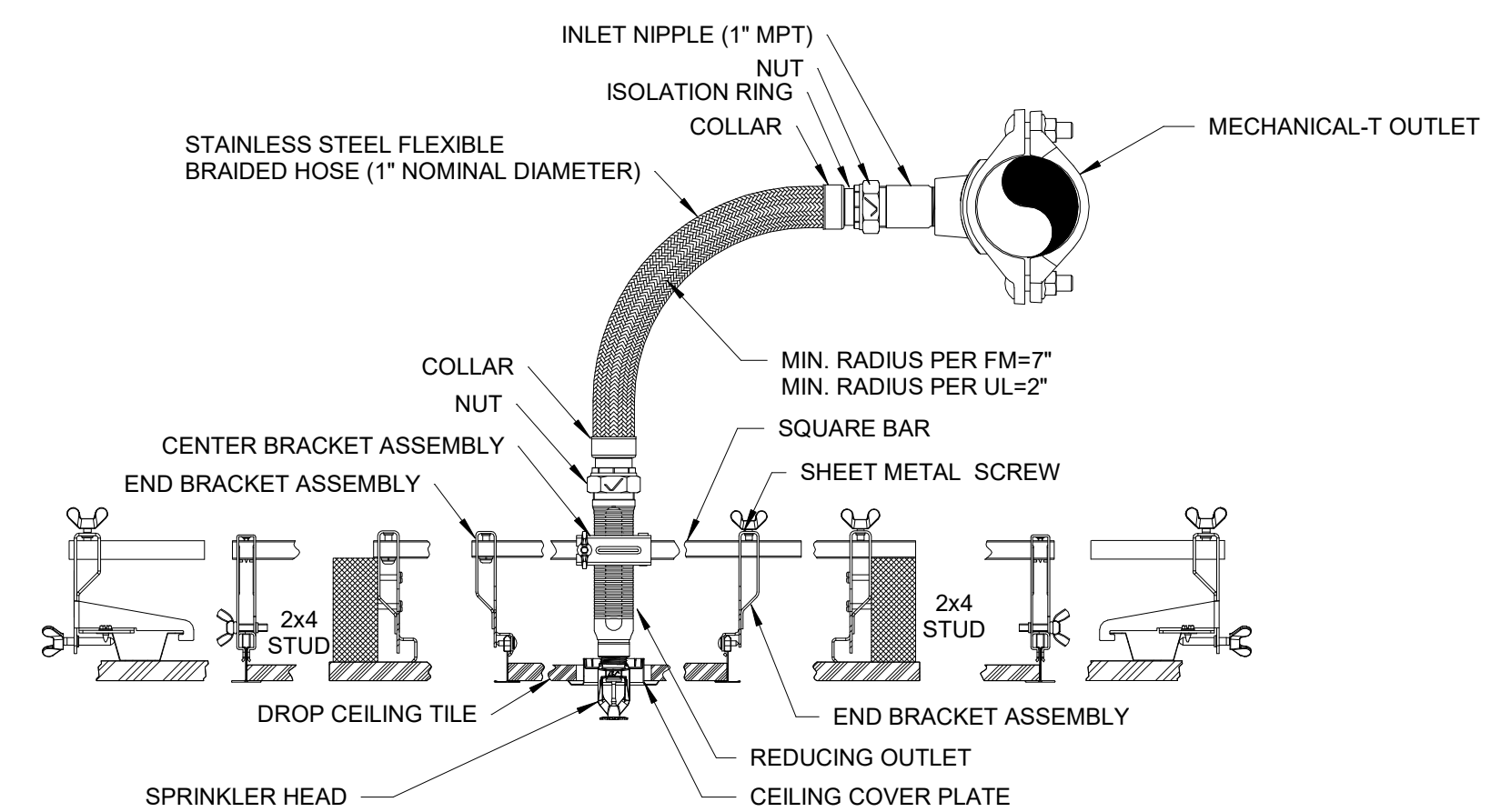
FP.402



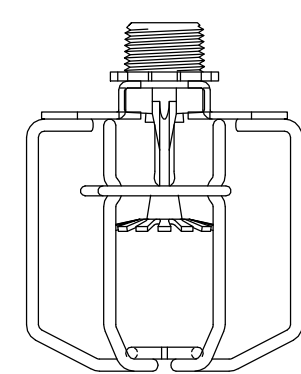
① HORIZONTAL SIDEWALL SPRINKLER
N.T.S.



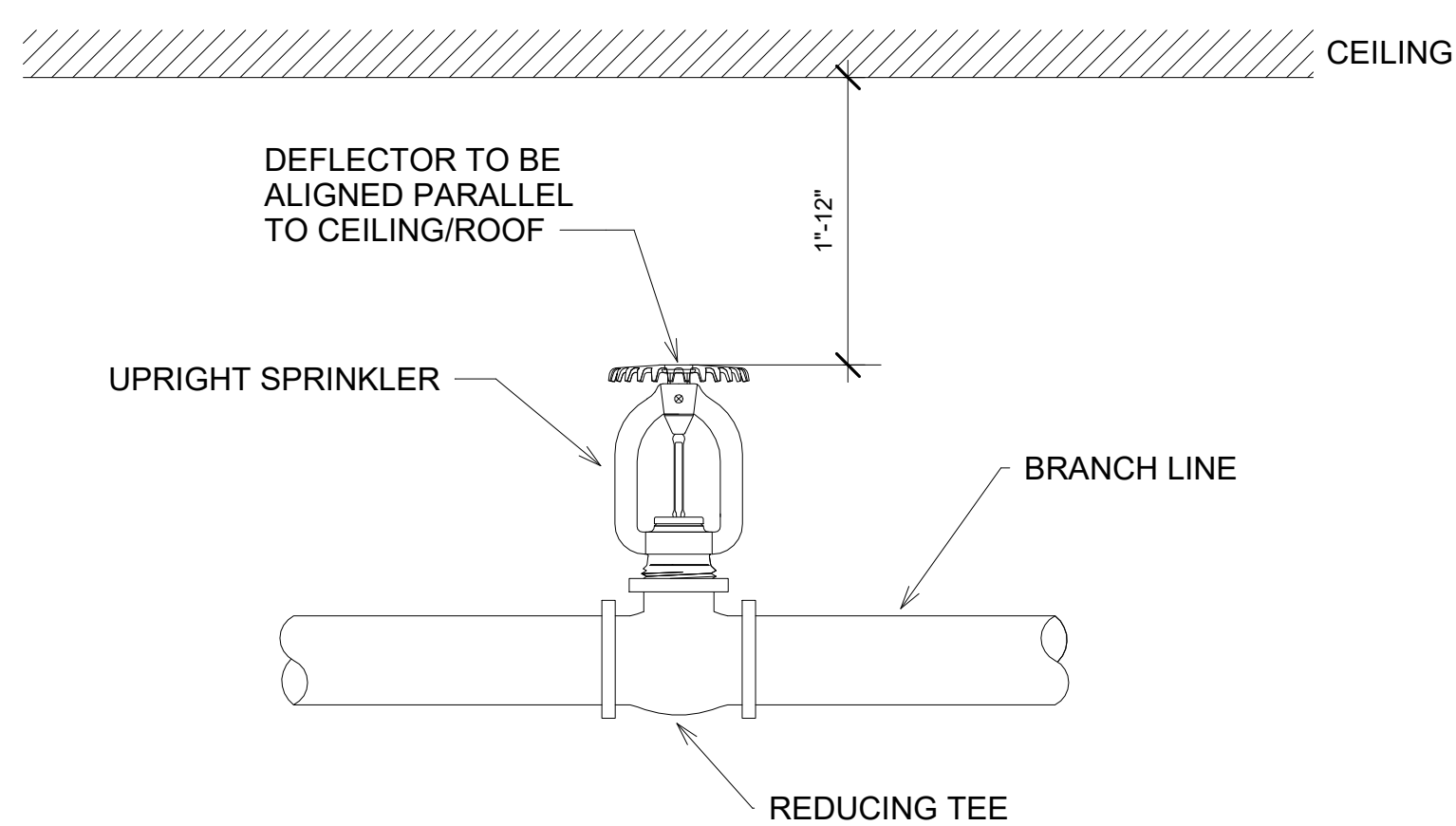
② CONCEALED PENDENT SPRINKLER HEAD IN SUSPENDED CEILING
N.T.S.



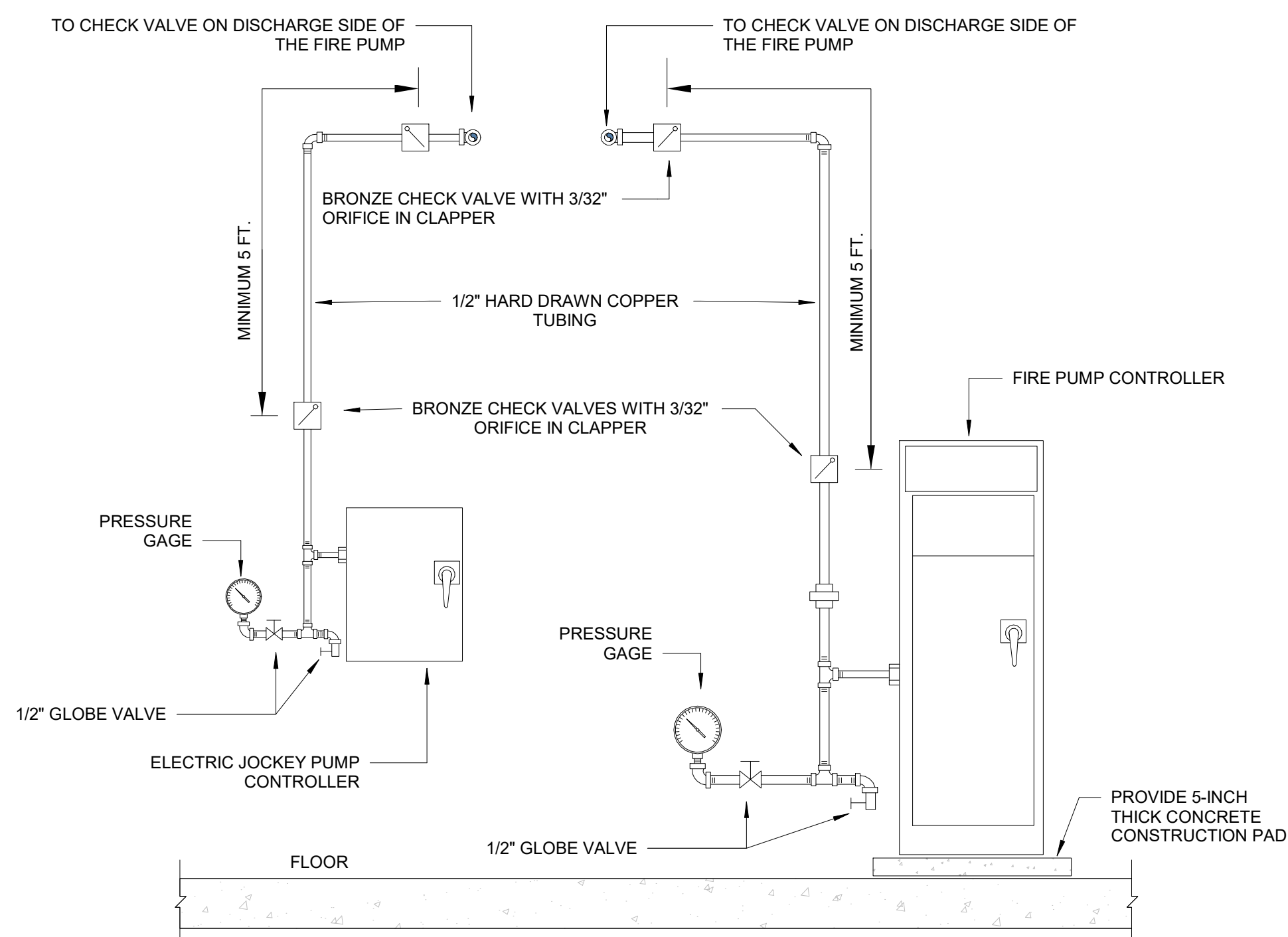
③ BRAIDED, FLEXIBLE HOSE SPRINKLER ASSEMBLY FOR CONCEALED PENDENT SPRINKLERS
N.T.S.



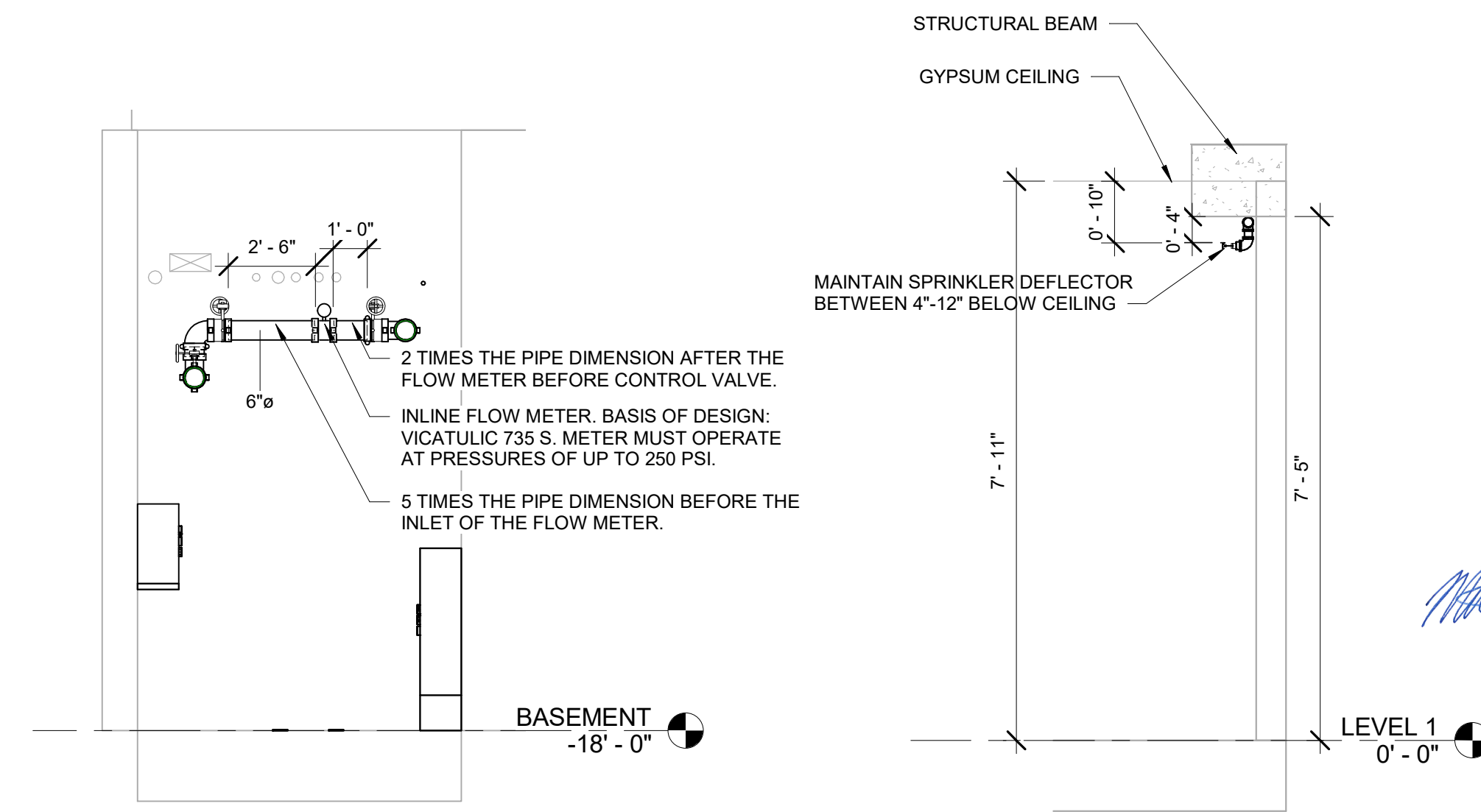
④ TYPICAL PENDENT SPRINKLER WITH GUARD
N.T.S.



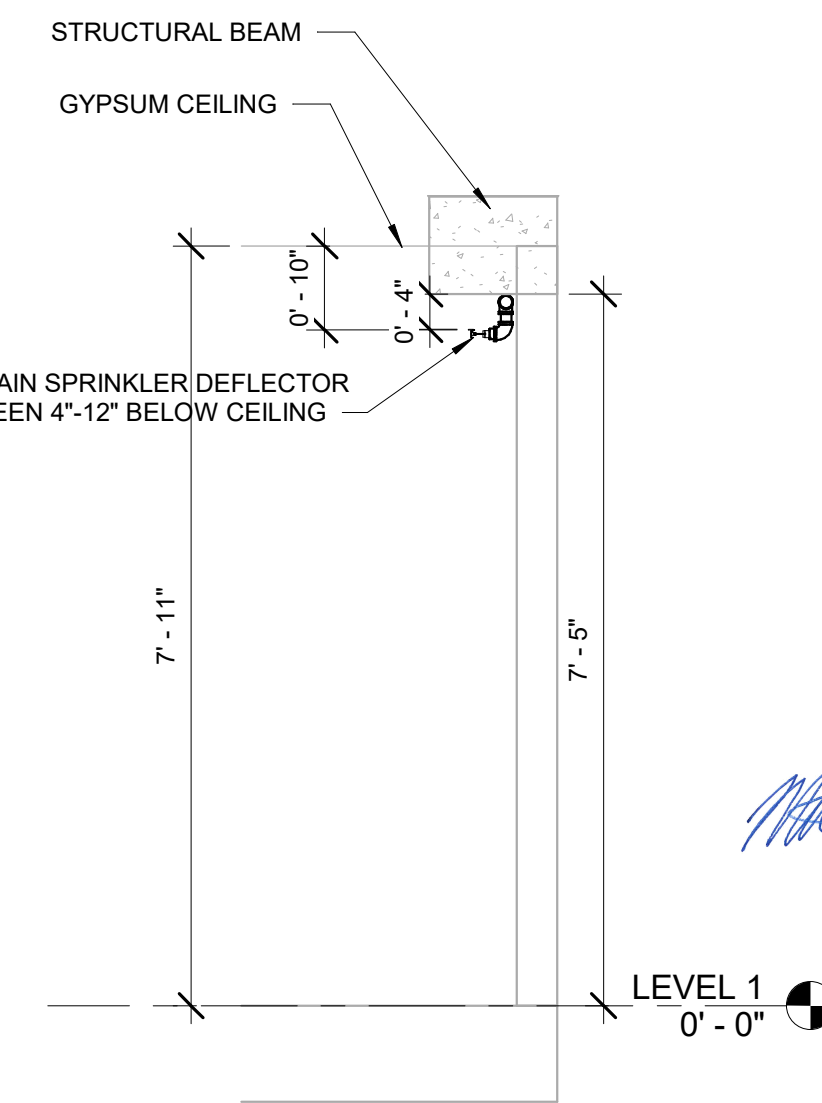
⑤ DETAIL - TYPICAL UPRIGHT SPRINKLER
N.T.S.



⑥ FIRE AND JOCKEY PUMP CONTROLLER SCHEMATIC
N.T.S.



⑦ INLINE FLOW METER DETAIL
1/4\"/>



⑧ ROOM SPRINKLER DETAIL
1/2\"/>

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FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
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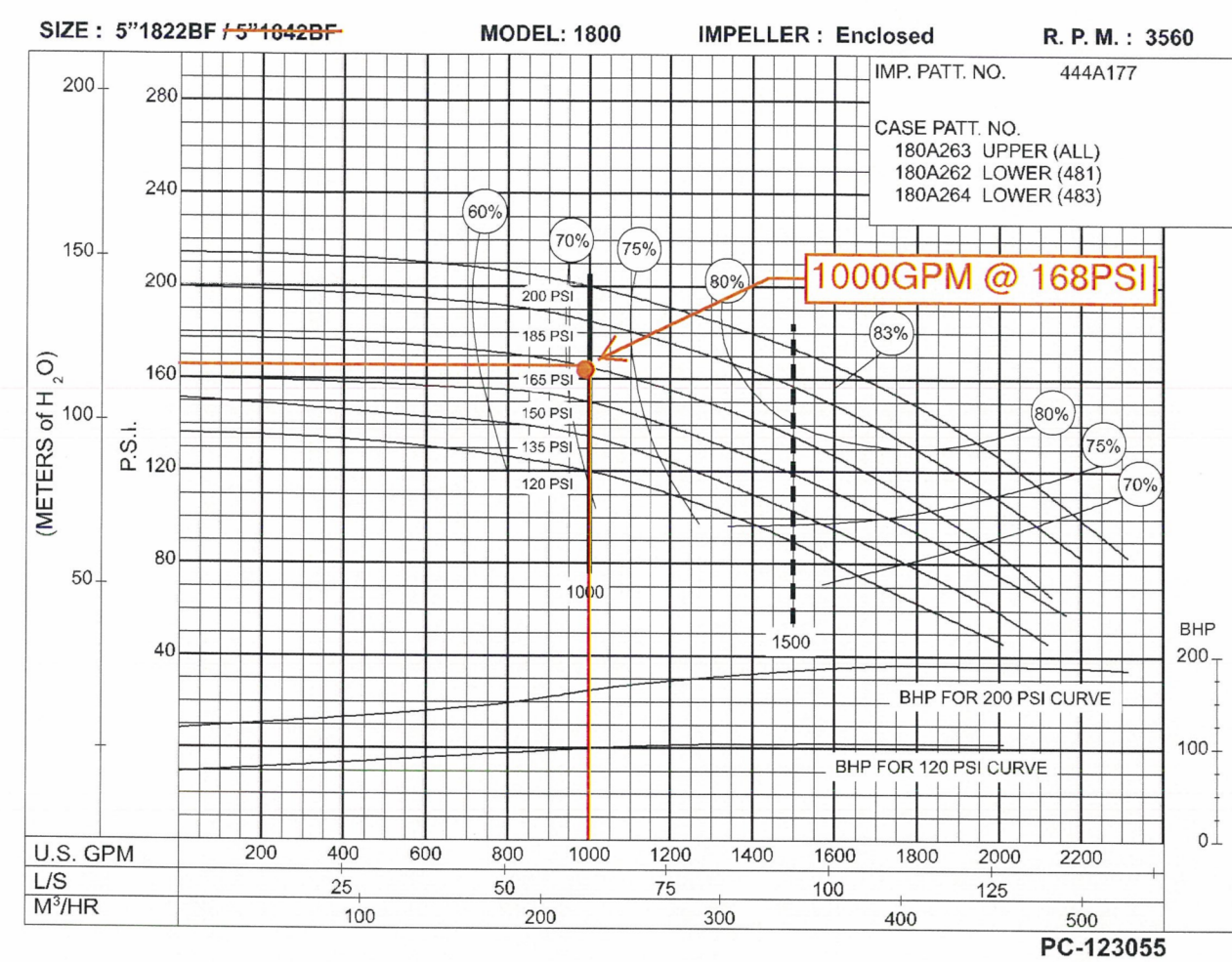
FIRE PROTECTION DETAILS

FP.501

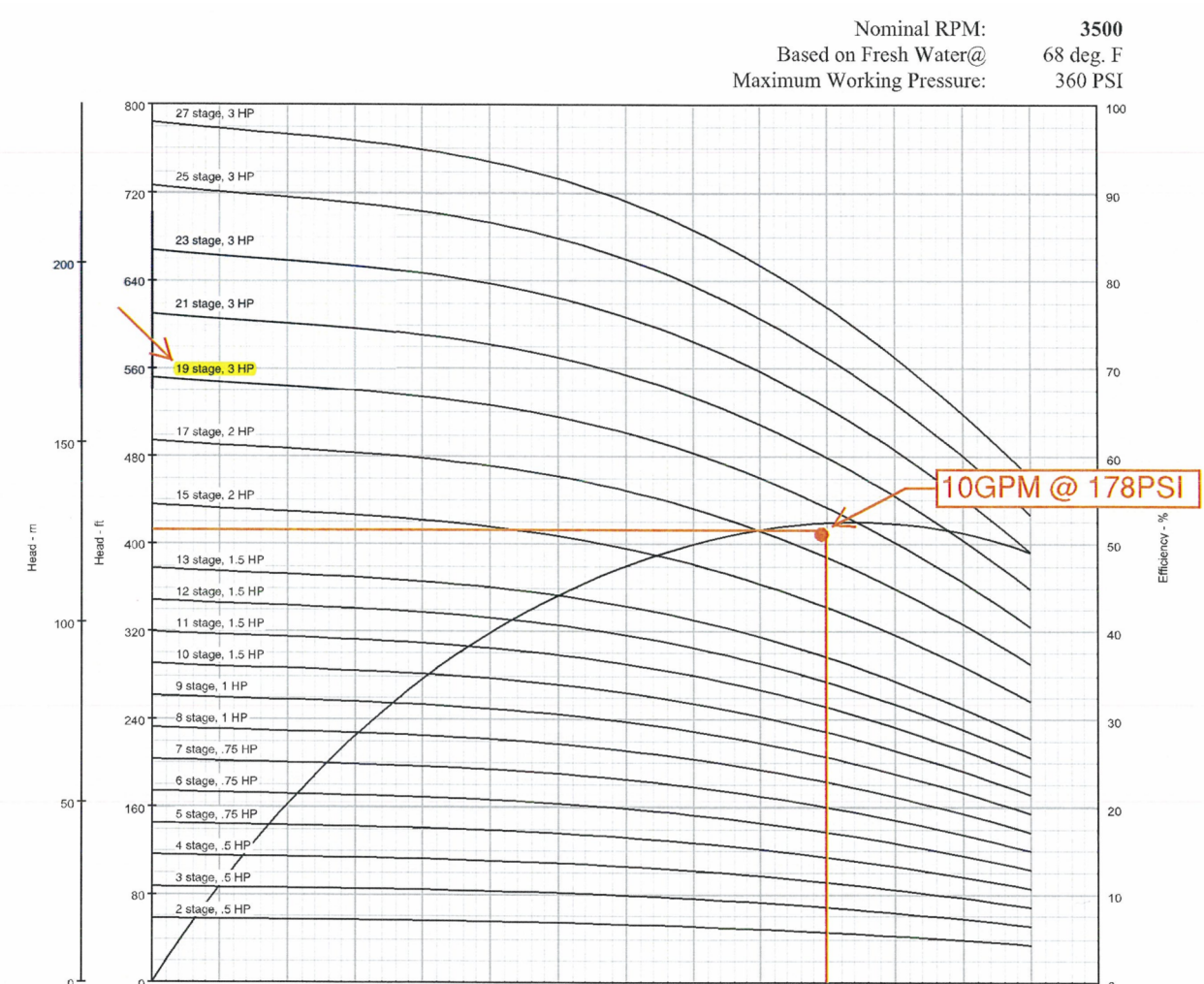
FIRE PUMP SCHEDULE								
MARK	DESCRIPTION	FLOW RATE	PRESSURE	BHP	V-PH-HZ	BASIS OF DESIGN		NOTES
						MANUFACTURER	MODEL NUMBER	
FP-1	HORIZONTAL SPLIT CASE FIRE PUMP	1000 GPM	168 psi	150	208-3-60	AURORA	5"-1822BF	DRAIN FIRE PUMP RELIEF VALVES TO SUMP PIT.
FP-2	JOCKEY PUMP	10 GPM	178 psi	3	208-3-60	AURORA	PVMX1-19	(NONE)

FIRE PUMP CONTROLLER SCHEDULE							
MARK	DESCRIPTION	PUMP ON PRESSURE	PUMP OFF PRESSURE	V-PH-HZ	BASIS OF DESIGN		NOTES
					MANUFACTURER	MODEL NUMBER	
FPC-1	FIRE PUMP CONTROLLER	230 psi	240 psi	208-3-60	MASTER	G4 ECYT	WYE-DELTA CLOSED STARTUP. INCLUDE INTEGRAL AUTOMATIC TRANSFER SWITCH
FPC-2	JOCKEY PUMP CONTROLLER	240 psi	250 psi	208-3-60	TORNA TECH	JP3	(NONE)

FIRE PUMP PERFORMANCE CURVE

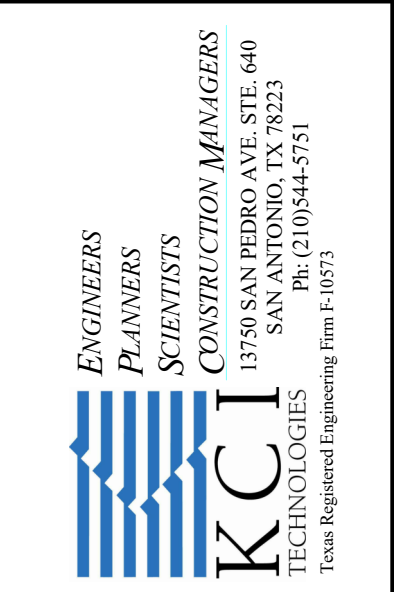


JOCKEY PUMP PERFORMANCE CURVE



No.	Description	Date
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FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS
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 SAN ANTONIO, TEXAS



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FIRE PROTECTION SCHEDULES	

FP.602

SCOPE OF WORK

CONTRACTOR SHALL PROVIDE NEW EMERGENCY RESPONDER FREQUENCY AMPLIFICATION SYSTEM DESIGNED TO ACHIEVE AMPLIFICATION OF SAN ANTONIO EMERGENCY BROADCAST FREQUENCIES.

PROVIDE SYSTEM THAT CONFORMS WITH SAN ANTONIO'S AMENDMENDED SECTION OF THE IFC. E.G., PROVIDE AMPLIFICATION OVER THE 800 MHZ BAND INCLUSIVE OF FREQUENCIES SPECIFICALLY UTILIZED BY EMERGENCY RESPONDERS, AND OTHER CUSTOM REQUIREMENTS.

BI-DIRECTIONAL AMPLIFIER SHALL BE LOCATED IN THE 5TH FLOOR ELECTRICAL CLOSET AS ILLUSTRATED ON DESIGN DRAWINGS.

HAZARDOUS MATERIALS: VARIOUS CONSTRUCTION MATERIALS WITHIN THE BUILDING CONTAIN ASBESTOS, INCLUDING DRYWALL, FLOOR FINISH, AND MOISTURE BARRIER MATERIALS. REFER TO REPORT FURNISHED BY TERRACON CONSULTANTS INC. DATED JANUARY 31, 2018 FOR DETAILS. PROVIDE APPROPRIATE HAZARDOUS MATERIAL ABATEMENT, REMOVAL, AND DISPOSAL METHODS PER THE REPORT DURING ALL PHASES OF CONSTRUCTION.

APPLICABLE CODES AND STANDARDS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

- CODE OF FEDERAL REGULATIONS, TITLE 24, HOUSING AND URBAN DEVELOPMENT (HUD)

INTERNATIONAL CODE COUNCIL (ICC)

- INTERNATIONAL BUILDING CODE (IBC), 2015 EDITION
- INTERNATIONAL FIRE CODE (IFC), 2015 EDITION




LOCAL CODE REQUIREMENTS

- SAN ANTONIO CODES AND ORDINANCES, CHAPTER 10, AMENDMENTS TO BUILDING RELATED CODES (SAIC)
- SAN ANTONIO CODES AND ORDINANCES, CHAPTER 11, AMENDMENTS TO THE INTERNATIONAL FIRE CODE

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 70, NATIONAL ELECTRIC CODE, 2014 EDITION

RF LEGEND

- NEW CONSTRUCTION LINework
-  OMNI-DIRECTIONAL ANTENNA. CEILING MOUNTED. FIRST VALUE IS COMPOSITE POWER, SECOND VALUE IS RSSI
-  BI-DIRECTIONAL AMPLIFIER
-  DONOR ANTENNA. COORDINATE AZIMUTH WITH AHJ.

RF ABBREVIATIONS

DAQ	DELIVERED AUDIO QUALITY
dB	DECIBELS IN DBM
RF	RADIO FREQUENCY
RGS	RIGID GALVANIZED STEEL
RSSI	RECEIVED SIGNAL STRENGTH INDICATION

RF GENERAL NOTES

(THESE NOTES APPLY TO ALL RF DRAWINGS)

1. THE GOAL OF THE SYSTEM SHALL BE TO ACHIEVE DAQ 3 IN 95% OF SPACES WITHIN THE BUILDING.
 2. CONTRACTOR SHALL FOLLOW SAN ANTONIO'S AMENDMENDED IFC SECTION 510 PROCESS FOR TESTING OF THE SYSTEM.
 3. TRADE PERMIT REQUIRED. THE CONTRACTOR SHALL PREPARE AND SUBMIT SHOP DRAWINGS TO THE LOCAL AHJ FOR THE RADIO AMPLIFICATION SYSTEM INCLUDING A RISER, POWER CONNECTION DETAILS, FLOOR PLANS SHOWING ALL DEVICE LOCATIONS, POWER SUPPLIES, AND CIRCUITRY FOR THE PROJECT/SYSTEM IN SUFFICIENT DETAIL TO CLEARLY REVIEW AND BUILD THE SYSTEM. PROVIDE INTERIOR PANEL WIRING AND DEVICE POINT-TO-POINT CONNECTION DETAIL DRAWINGS FOR ALL EQUIPMENT. SUBMIT TO AND OBTAIN APPROVAL FROM OWNER PRIOR TO SUBMISSION TO AHJ.
 4. SHOP DRAWINGS SHALL BE SUPPLEMENTED WITH CATALOG CUT SHEETS FOR ALL DEVICES AND MATERIALS AND GRAPHICAL MAP SHOWING DISTRIBUTION OF REQUIRED SIGNAL STRENGTH THROUGHOUT THE BUILDING.
 5. CHANGES IN THE LOCATIONS OF EQUIPMENT FROM THOSE SHOWN ON APPROVED SHOP DRAWINGS SHALL BE IDENTIFIED AND APPROVED IN WRITING PRIOR TO INSTALLATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECTIFYING UNAUTHORIZED NONCOMPLIANT CHANGES AT NO ADDITIONAL CHARGE TO THE OWNER.
 6. THE CONTRACTOR SHALL MAINTAIN ACCURATE RED-LINE CONSTRUCTION WORKING DRAWINGS ON SITE. FOLLOWING COMMISSIONING, CONTRACTOR SHALL PREPARE "AS-BUILT" DRAWINGS IN ELECTRONIC FORMAT, REFLECTING ACCURATE FIELD CONDITIONS.
 7. THE CONTRACTOR IS SPECIFICALLY RESPONSIBLE FOR ALL MEANS AND METHODS OF JOB SAFETY. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES AND REGULATIONS.
 8. IF THE CONTRACTOR OPTS TO INSTALL EQUIPMENT OTHER THAN THAT SPECIFIED, HE/SHE SHALL BE RESPONSIBLE FOR PERFORMING THE NECESSARY DESIGN SERVICES TO ACCOMMODATE THE EQUIPMENT. ANY SUCH CHANGES SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER. OWNER APPROVAL REQUIRED.
 9. ALL EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED.
 10. PROVIDE TRANSIENT SURGE SUPPRESSION FOR THE RADIO AMPLIFICATION SYSTEM POWER SUPPLY AND FOR ALL CIRCUITS LEAVING THE BUILDING.
 11. ALL DEVICES NEEDED FOR A COMPLETE AND WORKING FIRE ALARM SYSTEM ARE NOT SHOWN ON THESE CONCEPT DRAWINGS. PROVIDE EQUIPMENT AS NECESSARY FOR A FULLY OPERATIONAL SYSTEM.
 12. COAXIAL CABLE SHALL BE IN EMT AT A MINIMUM. OUTDOOR CIRCUITS SHALL BE IN RGS CONDUIT WITH NEMA 4X ENCLOSURES.
- ACCEPTANCE TESTING
13. ACCEPTANCE TESTING IS REQUIRED UPON COMPLETION OF INSTALLATION BY A LICENSED THIRD PARTY CONTRACTOR.
 14. EACH FLOOR OF THE BUILDING SHALL BE DIVIDED INTO A GRID OF APPROXIMATELY FORTY EQUAL AREAS.
 15. EACH AREA SHALL BE TESTED FOR MINIMUM PERFORMANCE OF DAQ 3.
 16. A MAXIMUM OF TWO NON ADJACENT AREAS WILL BE ALLOWED TO FAIL THE TEST.
 17. CONTRACTOR SHALL PROVIDE DOCUMENTATION OF PROOF OF PERSON WITH CURRECT FCC GENERAL RADIOTELEPHONE OPERATOR LICENSE.
 18. GAIN VALUES SHALL BE MEASURED AND THE RESULTS KEPT ON FILE WITH THE BUILDING OWNER. A COPY OF TEST RECORDS SHALL BE SUBMITTED TO THE SAN ANTONIO FIRE DEPARTMENT WITHIN 30 DAYS OF WHEN THE TEST HAS BEEN CONDUCTED.

FAIR AVENUE APARTMENTS FIRE PROTECTION IMPROVEMENTS

SAN ANTONIO HOUSING AUTHORITY
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 2018-08-17

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SHEET DATE
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EMERGENCY RADIO AMPLIFICATION
GENERAL NOTES

RF.001

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).*

“Do Not complete the Form 1295 until you have been awarded a contract.”

**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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2. Explanations and Interpretations to Prospective Bidders	1
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8. Contract Award	2
9. Bid Guarantee	3
10. Assurance of Completion	3
11. Preconstruction Conference	3
12. Indian Preference Requirements	3

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", of 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
DO NOT COMPLETE AT THIS TIME, FOR INFORMATION PURPOSES ONLY. TO BE COMPLETED BY AWARDED CONTRACTOR ONLY>			

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

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

Approved by OMB

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

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) Non-Collusive Affidavit: The undersigned party submitting this proposal hereby certifies that such bid is genuine and not collusive and that said Offerer has not colluded, conspired, connived or agreed, directly or indirectly, with any Offerer or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other Offerer, to fix overhead, profit or cost element of said bid price, or that of any other Offerer or to secure any advantage against the SAHA or any person interested in the proposed contract; and that all statements in said proposal are true.

Initials _____

(17) 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 and SWMBE 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 1\1/2\% 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 C. 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: TX180280 09/14/2018 TX280
 Superseded General Decision Number: TX20170280

State: Texas Construction Type: Building County: Bexar County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or 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
1	01/12/2018
2	03/23/2018
3	04/20/2018
4	07/06/2018
5	08/03/2018
6	09/14/2018

ASBE0087-014 01/01/2018 ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation).....	Rates \$ 22.72	Fringes 10.02

BOIL0074-003 01/01/2017 BOILERMAKER.....	Rates \$ 28.00	Fringes 22.35

ELEC0060-003 06/01/2016 ELECTRICIAN (Communication Technician Only)....	Rates \$ 21.57	Fringes 9%+4.65

ELEC0060-004 06/01/2018 ELECTRICIAN (Excludes Low Voltage Wiring).....	Rates \$ 28.30	Fringes 13%+5.05

ELEV0081-001 01/01/2018 ELEVATOR MECHANIC.....	Rates \$ 39.32	Fringes 32.645+a+b

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day; and Veterans Day.

ENGI0450-002 04/01/2014	Rates	Fringes
POWER EQUIPMENT OPERATOR-Cranes.....	\$ 34.85	9.85

* IRON0066-013 09/01/2018	Rates	Fringes
IRONWORKER, STRUCTURAL.....	\$ 22.05	6.73

* IRON0084-011 06/01/2018	Rates	Fringes
IRONWORKER, ORNAMENTAL.....	\$ 23.77	7.12

PLUM0142-009 07/01/2017	Rates	Fringes
HVAC MECHANIC (HVAC Electrical Temperature Control Installation Only).....	\$ 30.25	11.80
HVAC MECHANIC (HVAC Unit Installation Only).....	\$ 30.25	11.80
PIPEFITTER (Including HVAC Pipe Installation).....	\$ 30.25	11.80
PLUMBER (Excludes HVAC Pipe Installation).....	\$ 30.25	11.80

SFTX0669-002 04/01/2017	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 29.03	15.84

SHEE0067-004 04/01/2018	Rates	Fringes
Sheet metal worker Excludes HVAC Duct Installation.....	\$ 26.35	15.29
HVAC Duct Installation Only.....	\$ 26.10	15.25

SUTX2014-006 07/21/2014	Rates	Fringes
BRICKLAYER.....	\$ 22.15	0.00
CARPENTER (Acoustical Ceiling Installation Only).....	\$ 17.83	0.00
CARPENTER (Form Work Only).....	\$ 13.63	0.00
CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work, and Metal Stud Installation....	\$ 16.86	4.17
CAULKER.....	\$ 15.00	0.00
CEMENT MASON/CONCRETE FINISHER.....	\$ 22.27	5.30
DRYWALL FINISHER/TAPER.....	\$ 13.81	0.00
DRYWALL HANGER AND METAL STUD INSTALLER.....	\$ 15.18	0.00
ELECTRICIAN (Low Voltage Wiring Only).....	\$ 20.39	3.04
IRONWORKER, REINFORCING.....	\$ 12.27	0.00
LABORER: Common or General.....	\$ 10.75	0.00
LABORER: Mason Tender - Brick.....	\$ 11.88	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 12.00	0.00
LABORER: Pipelayer.....	\$ 11.00	0.00

LABORER: Roof Tearoff.....	\$ 11.28	0.00
LABORER: Landscape and Irrigation.....	\$ 8.00	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 15.98	0.00
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 14.00	0.00
OPERATOR: Bulldozer.....	\$ 14.00	0.00
OPERATOR: Drill.....	\$ 14.50	0.00
OPERATOR: Forklift.....	\$ 12.50	0.00
OPERATOR: Grader/Blade.....	\$ 23.00	5.07
OPERATOR: Loader.....	\$ 12.79	0.00
OPERATOR: Mechanic.....	\$ 18.75	5.12
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)...	\$ 16.03	0.00
OPERATOR: Roller.....	\$ 12.00	0.00
PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping.....	\$ 13.07	0.00
ROOFER.....	\$ 12.00	0.00
TILE FINISHER.....	\$ 11.32	0.00
TILE SETTER.....	\$ 14.94	0.00
TRUCK DRIVER: Dump Truck.....	\$ 12.39	1.18
TRUCK DRIVER: Flatbed Truck.....	\$ 19.65	8.57
TRUCK DRIVER: Semi-Trailer Truck.....	\$ 12.50	0.00
TRUCK DRIVER: Water Truck.....	\$ 12.00	4.11

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 Youth Build Program

_____ Category IV – 30% of workforce is Section 3 qualified or subcontract greater than 25% of contract value to certified Section 3 Business Concern

Bid Fee Sheet

page 1 of 1

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.

Description	Cost
Fair Avenues Apts Fire Protection Improvements as specified	\$

Delivery in _____ days:

(Failure to enter a delivery time will subject bidder to completion in 240 days. Days are defined as calendar days.)

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

Bidder's Certification

By signing below, Bidder certifies that the following statements are true and correct:

1. He/she has full authority to bind Bidder and that no member Bidder's organization is disbarred, suspended or otherwise prohibited from contracting with any federal, state or local agency,
2. Items for which Bids were provided herein will be delivered as specified in the Bid,
3. 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.,
4. Bidder agrees that this bid shall remain open and valid for at least a period of 90 days from the date of the Bid Opening and that this bid shall constitute an offer, which, if accepted by SAHA and subject to the terms and conditions of such acceptance, shall result in a contract between SAHA and the undersigned Bidder,
5. He/she has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with this Bid,
6. Bidder, nor the firm, corporation, partnership, or institution represented by the Bidder, or anyone acting for such firm, corporation or institution has violated the antitrust laws of the State of Texas or the Federal Antitrust laws, nor communicated directly or indirectly the bid made to any competitor or any other person engaged in such line of business,
7. Bidder has not received compensation for participation in the preparation of the specifications for this IFB,
8. **Non-Collusive Affidavit:** The undersigned party submitting this bid hereby certifies that such bid is genuine and not collusive and that said Bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any Bidder or person, to put in a sham Bid or to refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or of any other Bidder, to fix overhead, profit or cost element of said bid price, or that of any other Bidder or to secure any advantage against SAHA or any person interested in the proposed contract; and that all statements in said bid are true.
9. **Child Support:** Pursuant to Section 231.006 (d) of the Texas Family Code, regarding child support, the bidder certifies that the individual or business entity named in this bid is not ineligible to receive the specified payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate.
10. **Lobbying Prohibition:** 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.
11. **Non-Boycott of Israel:** SAHA may not enter into a contract with a company for goods and services unless the contract contains a written verification from the company that; (i) it does not Boycott Israel; and (ii) will not Boycott Israel during the term of the contract. (Texas Government Code chapter 2270) by accepting these General Conditions and any associated contract, the CONTRACTOR certifies that it does not Boycott Israel, and agrees that during the term of this contract will not Boycott Israel as that term is defined in the Texas Government Code Section 808.001, as amended.
12. **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. By signature hereon bidder certifies that it is not affiliated in any manner with the businesses on this list.

SIGNED: _____

(Print Name)

(Print Company Name)

(Company Phone)

(Fax)

(Email Address)

(Date)