

2640 Fountain View Drive, Houston, Texas 77057 | 713.260.0600 | David A. Northern, Sr., **President & CEO Houston Housing Authority Board of Commissioners:** LaRence Snowden, *Chair* | Kristy M. Kirkendoll, *Vice Chair* Dr. Max Miller, Jr. | Stephanie Ballard | Andrea Hillard Cooksey | Kris Thomas | Guillermo "Will" Hernandez

The Houston Housing Authority (HHA), has issued this Amendment No. 1 to IFB 22-50 Remediation and Demolition of Clayton Homes for the purposes of:

1. Revise Section 4.0 Procurement Schedule to read:

EVENT	DATE
Scheduled Site Visits	9 A.M thru 5 P.M. December 13-19, 2022 December 20 – 23, 2022 (Note See Section 4.2.1)
Deadline for the Receipt of Written Questions to <u>Purchasing@housingforhouston.com</u>	4 P.M. "CST" December 27, 2022
Deadline Answers to Written Questions will be posted on <u>HousingforHouston.com</u>	5 P.M. "CST" December 29, 2022
Deadline for the Receipt of Sealed Responses	2 P.M. "CST" January 5, 2023

- 2. Incorporate:
 - 2.1 Exhibit E Asbestos Abatement Specification; and,
 - 2.2 Exhibit F Site Drawings

All other terms and conditions shall remain the same.

12-16-22

Date

Austin Crotts

Austin Y. Crotts, MA Procurement Manager, Houston Housing Authority

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A Fair Housing and Equal Employment Opportunity Agency. For assistance: Individuals with disabilities may contact the 504/ADA Administrator at 713-260-0353, TTY 713-260-0574 or 504ADA@housingforhouston.com

Amendment No. 1 IFB 22-50 Page 2 of 2



Terrain Solutions, Inc.

Texas Geoscience Firm Reg.#50018

10103 Fondren Road, Suite #426 Houston, Texas 77096 www.TerrainSolutionsInc.com Telephone: 713 - 467 - 2900 Fax: 1-713-583-1045 Email: office@terrainsolutionsinc.com

December 16, 2022

Mr. Jay Mason and Ms. Diana Dmitriyeva Houston Housing Authority 2460 Fountain View Drive, Suite 3017 Houston, Texas 77057

Re: Asbestos Abatement Specification Clayton Homes Apartments 1919 Runnels Street Houston, TX 77003 TSI Project #221284-01R

Dear Mr. Mason and Ms. Dmitriyeva:

In accordance with the authorization on December 5, 2022 referencing TSI Proposals P2022-144, **Terrain Solutions, Inc. (TSI)** is pleased to present the Asbestos Abatement Specification prepared by FERN environmental for the site referenced above. This specification was prepared before an asbestos survey was performed by TSI and is based on a previous assessment performed on the demolished buildings on the northern half of the property. The TSI team is currently performing an asbestos survey of the remaining structures and any modifications to this specification will be made upon the completion of the asbestos survey.

Thank you for allowing **TSI** to be your consultant for this project. If you have any questions, please call me at (713) 467-2900.

Respectfully submitted

Glenn R. Lowenstein, PG Program Manager Terrain Solutions, Inc. Texas Geoscience Firm #50018

Enclosures

Exhibit E IFB 22-50

ASBESTOS ABATEMENT SPECIFICATION

Clayton Homes Apartments 1919 Runnels St. Houston, TX 77003





Abatement Specification Issued By: FERN Environmental, LLC 1900 West Gray #131631 Houston, Texas 77219 (832) 797-3059 FAX: (713) 202-4717 TDSHS Asbestos Consultant Agency Lic. # 100455 Exp:2/15/24 TDSHS Asbestos Laboratory Lic. #300482 Exp:11/17/24 TDLR Mold Assessment Company Lic. # ACO1147 Exp:12/16/24 TDSHS Lead Firm Lic. #2110668 Exp:11/30/24

FERN Project No. 0222-286

December 8, 2022

Greg Lall TDSHS Asbestos Consultant Lic. #10-5216 Exp:02/29/24 TDSHS Lead Risk Assessor Lic. #2070478 Exp:12/28/24 TDLR Mold Consultant Lic. #MAC0239 Exp:01/11/24

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December 8, 2022

PROJECT: Removal of Asbestos-Containing Materials Clayton Homes Apartments 1919 Runnels St. Houston, TX 77003

CONSULTANT: FERN Environmental, LLC 1900 West Gray #131631 Houston, Texas 77219 TDSHS Asbestos Consultant Agency Lic. No. 10-0455 Project No. 0222-286

Brondell

Greg Lall, TDSHS Lic. No. 10-5216, Exp: 02/29/24

SUMMARY OF WORK:

This project will include the proper removal, transportation and disposal of asbestos-containing materials, including but not limited to the following approximate quantity of materials, from the buildings at the site:

Location	Work Scope	Approximate Quantity
25 Apartment	Remove black residual floor mastic on 1 st floors throughout	110,200 SF
Buildings	Remove mirror mastic at 2 nd floor units throughout	210 each

Notes:

(1) In addition to the general project requirements outlined throughout this document, specific ACM removal requirements are included in the following sections:

2.21 – Gross Removal (page 25)

2.24 - Floor Covering Removal (page 27)

(2) Full PPE consisting of at a minimum, ½ face HEPA filter equipped respirator, and protective clothing; and full containment with negative pressure shall be utilized for gross removal as outlined in this specification.

1.1 GENERAL REQUIREMENTS:

The Contractor shall get familiarized with the conditions for the project and is responsible for quantifying the materials to be abated and verifying the locations of all work to be performed as outlined in this specification. Failure to do so shall not relieve the Contractor of his obligation to furnish all materials and labor necessary to carry out the provisions of the Contract. All quantities must be field verified prior to bidding.

- **1.1.1** On-site ambient air monitoring and final clearance will be conducted by a third party environmental consultant. Final clearance air samples in asbestos work areas will be collected and analyzed by Phase Contrast Microscopy (PCM).
- **1.1.2** Remove all asbestos-containing and contaminated materials including multiple layers, leaving a clean substrate. Consider asbestos containing finishes, including wall and ceiling finishes, and floor coverings, to be multiple layered.
- **1.1.3** Remove and dispose of all asbestos-contaminated waste in accordance with applicable regulations and these specifications.
- **1.1.4** These materials have been identified as being impacted by proposed renovation activities at the facility.
- **1.1.5 START OF WORK:** The work start date shall be coordinated with the Owner. Any deviations to the start or completion of work date shall be coordinated with the Owner, TDSHS, and the Consultant.
- **1.1.6 <u>TIME FOR COMPLETION</u>:** The completion date shall be coordinated with the Owner.
- **1.1.7** <u>LIQUIDATED DAMAGES:</u> All work is to be completed as mutually agreed by and between the Owner and the Contractor. Failure to complete Work (including Clean-up) will be addressed as contractually agreed between the Owner and the Contractor.

1.1.8 ABATEMENT CONTRACTOR'S DUTIES:

- 1.1.8.1 Except as specifically noted, provide and pay for: Labor, materials, OSHA monitoring of personnel, equipment and other facilities and services necessary for proper execution and completion of work.
- 1.1.8.2 Pay legally required sales, consumer, use, payroll, privilege and other taxes.
- 1.1.8.3 Secure and pay for, as necessary, to provide proper execution and completion of work, and as applicable at the time of bids:

Permits Government Fees excluding ARU fees Licenses Waste disposal permits and costs

- 1.1.8.4 Give required notices. Provide all necessary information to Owner in a timely manner so that the 10-day notification may be filed with DSHS, and work may start as scheduled.
- 1.1.8.5 Provide and pay for tie-in to existing electrical service and placement and activation of Contractor's power panel at the work area by a licensed electrician.
- 1.1.8.6 Provide and pay for temporary electrical service, including power generator and fuel, as necessary to provide proper execution and completion of work.
- 1.1.8.7 Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities (including EPA regulations, AHERA, NESHAP, DSHS and OSHA)

which bear on performance of work. Where conflicts occur between these specifications and/or the above-mentioned regulations, the more stringent shall govern.

- 1.1.8.8 If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify Consultant in writing, and any necessary changes shall be accomplished by appropriate modification. It is not the Abatement contractor's responsibility to make certain that the Contract Documents are in accordance with applicable laws, statutes, building codes and regulations. If the Abatement contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to Consultant, he shall assume full responsibility therefore and shall bear all cost attributable thereto.
- 1.1.8.9 <u>PLAN OF ACTION</u>: Submit a detailed plan of action for the procedures proposed for use in complying with the requirements of this specification. Utilize shop drawings, 81/2 x 11 format and include the location and layout of work areas, secure areas for storage, hazardous materials storage, the sequencing of abatement work, the interface of trades involved in the performance of the work, methods to be used to assure the safety of the workers, the public, and visitors to the site, a disposal plan with the location of the approved disposal site, and a detailed description of the methods to be employed to control pollution. The plan must be delivered to the Owner prior to commencement of work.
- 1.1.8.10 <u>INSPECTION</u>: Prior to the commencement of the work, inspect the areas where work will be performed. Document and submit to the Consultant any discrepancies in the scope prior to starting the work. The Abatement contractor is responsible for any and all site inspections, estimations of quantity of work, or recognition of unusual or special conditions which may affect a timely and scheduled completion of this work. The Abatement contractor shall satisfy himself that the work can be completed as set forth by the specifications before starting work.
- 1.1.8.11 <u>POTENTIAL ASBESTOS HAZARD</u>: The disturbance or dislocation of asbestoscontaining materials may cause asbestos dust to be released into the atmosphere and deposited on surfaces, creating a potential health hazard. Apprise all workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.
- 1.1.8.12 <u>ABATEMENT CONTRACTOR USE OF PREMISES</u>: Eating or drinking will not be permitted in or around the work area, showers or clean room at any time. Smoking is not permitted on the property. Confine the work activities within the designated area of construction. Do not block drives or access to other portions of the site.
- 1.1.8.13 Enforce strict discipline and good order among employees. Do not employ on the project unfit persons or persons not skilled in assigned task.
- 1.1.8.14 Comply with all applicable federal, state, and local laws regarding job discrimination and payment of prevailing wage rates.
- 1.1.8.15 Using the best available technology, procedures, and methods for preparation, execution, cleanup, disposal, and safety are absolutely required. This compliance is the sole responsibility of the abatement contractor.
- 1.1.8.16 Coordinate all work schedules with the Owner and Consultant and assist in submitting TDSHS 10 day notice prior to the start of the work.
- 1.1.8.17 Assume responsibility for the proper and safe execution of the work.
- 1.1.8.18 Contractor's Asbestos Abatement Supervisors shall remain on the job site and in immediate contact with those under their supervision during all periods of asbestos

abatement activity.

- 1.1.8.19 All licensed supervisors are responsible for respirator fit testing, personal protection of the workers, safety, security and control of access at the jobsite.
- 1.1.8.20 Supervisors shall also require that operations at the job site cease whenever hazardous or unlawful situations are detected, so as to effect a remedy.
- 1.1.8.21 Safety Requirements: At least one fire extinguisher with a minimum National Fire Protection Association rating of 10 BC (dry chemical) shall be placed for every 1,000, or fraction square feet of regulated area.

Ground-Fault Circuit Interrupter (GFCI) units shall be installed on all electrical circuits within the regulated, or contained area.

Contractor shall also meet the specific safety requirements mentioned in the preconstruction meeting.

- 1.1.8.22 Contractor, transporter and disposal site shall meet the licensing and registration requirements of the Texas Department of Health's Teas Asbestos Health Protection Rules.
- **1.1.9 COORDINATION:** The General Contractor shall be responsible for the coordination and scheduling of the total project. General Contractor shall be responsible for the performance of his Subcontractors and shall cooperate with the Consultant so as to facilitate the general progress of the work.

1.2 STOP WORK:

1.2.1 If the Owner, or his designated representative, presents a written or verbal stop work order, immediately stop all work or at that portion of the work designated. A verbal stop work order shall be confirmed by a written stop work order within 24 hours. Do not commence referenced work until authorized in writing by the Owner or his designated representative.

1.3 ABATEMENT CONTRACTOR USE OF PREMISES:

- **1.3.1** <u>**GENERAL:**</u> During the abatement period the Abatement contractor shall have the exclusive use of the premises included in the current work phase for abatement operations.
- **1.3.2 USE OF SITE:** Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project abatement.
 - 1.3.2.1 Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials.
 - 1.3.2.2 Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to areas acceptable to Owner. If additional storage is necessary, obtain and pay for such storage off-site.
 - 1.3.2.3 Do not load structure with weight that will endanger structure.
 - 1.3.2.4 Assume full responsibility for protection and safekeeping of products stored on premises.
 - 1.3.2.5 Take all cautions necessary to ensure there is no asbestos contamination to those areas not included in work schedule. Should areas outside the work area become

contaminated with asbestos-containing materials due to poor work practices, the Abatement contractor shall immediately clean them utilizing the wet cleaning and HEPA vacuum methods specified in this document.

- **1.3.3** ABATEMENT CONTRACTORS USE OF THE EXISTING BUILDING: Maintain the existing building in a safe and weather tight condition throughout the abatement period.
 - 1.3.3.1 Smoking or open fires will not be permitted within the building enclosure or on the premises.

1.4 DEFINITIONS:

- **1.4.1** <u>GENERAL EXPLANATION</u>: A substantial amount of specification language constitutes definitions for terms found in other contract documents including the drawings. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon. Certain terms used in contract documents are defined in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extent they are not stated more explicitly in another element of contract documents.
- **1.4.2 <u>GENERAL REQUIREMENTS</u>: The provisions or requirements of Division-1 sections apply to entire work of Contract, and where so indicated, to other elements which are included in the project.**
- **1.4.3 INDICATED:** The term "indicated" is a cross-reference to graphic representations, notes, or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for purpose of helping the reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- **1.4.4 DIRECTED, REQUESTED, ETC:** Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by the Consultant", "requested by the Consultant", and similar phrases. However, no such implied meaning will be interpreted to extend the Consultant's responsibility into Contractor's responsibility for construction supervision.
- **1.4.5** <u>APPROVE:</u> Where used in conjunction with the Consultant's response to submittals, requests, applications, inquiries, reports, and claims by Abatement contractor, the meaning of the term "approved" will be held to limitations of the Consultant's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by the Consultant be interpreted as a release of Abatement contractor from responsibilities to fulfill requirements of contract documents.
- **1.4.6 <u>FURNISH</u>:** Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- **1.4.7 INSTALL:** Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, as applicable in each instance.
- **1.4.8 PROVIDE:** Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- **1.4.9 INSTALLER:** The term "installer" is defined as the entity (person or firm) engaged by Abatement contractor, or its subcontractor or sub-subcontractor for performance of a particular unit of work at project site, including installation, erection, application, and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to

perform.

1.4.10 PROJECT ADMINISTRATOR: The entity described as the "Project Representative" in AIA Document A201 "General Conditions of the Contract for Construction". The Project Administrator is a representative of the Owner at the job site with authority to stop the work upon verbal order if requirements of the contract documents are not met or if in the sole judgment of the Project Administrator, the Consultant, Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.

1.5 INDUSTRY STANDARDS:

- **1.5.1 GENERAL APPLICABILITY OF STANDARDS:** Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards are written directly into the contract documents, applicable standards of the construction industry have the same force and effect and are made a part of contract documents by reference as if copied directly into contract documents, or as if published copies were bound herewith.
- **1.5.2 REFERENCED STANDARDS:** Referenced directly in contract documents or by governing regulations have precedence over non-referenced standards which are recognized in industry for applicability to work.
- **1.5.3 NON-REFERENCED STANDARDS:** Hereby defined to have no particular applicability to the work, except as general requirements of whether the work complies with standards recognized in the construction industry.
- **1.5.4 <u>PUBLICATION DATES:</u>** Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents.
- **1.5.5** <u>**COPIES OF STANDARDS:**</u> The contract documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents.
- **1.5.6** <u>ABBREVIATIONS AND NAMES:</u> The following acronyms, or abbreviations as referenced in contract documents, are defined to mean the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of contract documents.

AIA	American Institute of Architects 1735 New York Ave. NW Washington, DC 20006	(202) 626-7474
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018	(212) 354-3300
ASHRAE	American Society for Heating, Refrigerating & Air Conditi 1791 Tullie Circle NE Atlanta, GA 30329	oning (404) 636-8400
ASTM	American Society for Testing & Materials 1916 Race Street Philadelphia, PA 19103	(215) 299-5400
CFR	Code of Federal Regulations Available from Government Printing Office Washington, DC 20402 (usually first published in Federal Register)	

EPA	Environmental Protection Agency 401 M Street SW Washington, DC 20460	(202) 382-3949
NEC	National Electrical Code (by NFPA)	
NESHAP	National Emission Standards for Hazardous Air Pollutants	
NFPA	National Fire Protection Association Batterymarch Park Quincy, MA 02269	(617) 770-3000
OSHA	Occupational Safety & Health Administration (U.S. Dept. of Labor) Government Printing Office Washington, DC 20402	
UL	Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062	(312) 272-8800

1.6 CODES AND REGULATIONS:

- **1.6.1** <u>GENERAL APPLICABILITY OF CODES, REGULATIONS, AND STANDARDS</u>: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.
- **1.6.2 FEDERAL REGULATIONS:** Those which govern asbestos abatement work or hauling and disposal of asbestos waste materials including but not limited to the following:

U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

<u>General Industry</u> Title 29, Part 1910, Section 1001 of the Code of Federal Regulations

<u>Respiratory Protection</u> Title 29, Part 1910, Section 134 of the Code of Federal Regulations

<u>Construction Industry</u> Title 29, Part 1926.1101, and 1926.62 of the Code of Federal Regulations

<u>Access to Employee Exposure & Medical Records</u> Title 29, Part 1910, Section 20 of the Code of Federal Regulations

<u>Hazard Communication</u> Title 29, Part 1910, Section 1200 of the Code of Federal Regulations

<u>Specifications for Accident Prevention Signs and Tags</u> Title 29, Part 1910, Section 145 of the Code of Federal Regulations

U.S. Environmental Protection Agency (EPA) including but not limited to:

Worker Protection Rule

40 CFR Part 763, Subpart G CPTS 62044, FKR 2843-9 Federal Register, Vol. 50, No. 134, 7/12/85 P28530-28540

Regulation for Asbestos Title 40, Part 61, Subpart A of the Code of Federal Regulations

National Emission Standard for Asbestos Title 40, Part 61, Subpart M of the Code of Federal Regulations including Asbestos NESHAP Revision; Final Rule, Federal Register; Tuesday, November 20, 1990

Asbestos Hazard Emergency Response Act (AHERA) Regulations 40 CFR 763 Subpart E

U.S. Department of Transportation (DOT) including but not limited to:

Hazardous Substances: Final Rule Regulation 49 CFR, Parts 171 and 172

- **1.6.3 STATE AND LOCAL REGULATIONS:** Abide by all state and local regulations which govern asbestos abatement work or hauling and disposal of waste materials, including but not limited to Texas Asbestos Health Protection Rules.
- **1.6.4 STANDARDS:** Those which govern abatement work or hauling and disposal of asbestos waste material include but are not limited to the following, or the latest update:

American National Standards Institute (ANSI)

Fundamentals Governing the Design and operation of Local Exhaust Systems Publication Z9.2-79

Practices for Respiratory Protection Publication Z88.2-92

1.6.5 EPA GUIDANCE DOCUMENTS: Those which discuss asbestos abatement work or hauling and disposal of asbestos waste materials are listed below only for the Contractor's information. These documents do not describe the work and are not a part of the work of this contract.

Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book) EPA560/5-85-024.

Asbestos Waste Management Guidance EPA 530-SW-85-007.

1.6.6 NOTICES:

- 1.6.6.1 U.S. ENVIRONMENTAL PROTECTION AGENCY: Assist Owner with compilation of necessary information for submission of written notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M as amended) to the regional Asbestos NESHAP Contact or the delegated state or local agency at least 10 working days prior to beginning any work on asbestos-containing materials. Should abatement work begin on a date other than that contained in the original notice, assist Owner with the renotification as per regulations.
- **1.6.7 PERMITS:** Obtain all building and special permits required for all the asbestos abatement work.
- 1.6.8 LICENSES: Maintain current licenses as required by applicable state or local jurisdictions for the

removal, transporting, disposal, or other regulated activity relative to the work of this contract.

- **1.6.9 POSTING AND FILING OF REGULATIONS:** Maintain two (2) copies of applicable federal, state, and local regulations above. Post one copy of each at the job site. Keep on file in the Project Data Binder, covered earlier.
- **1.6.10 SIGN REQUIREMENTS:** Project identification signs or abatement contractor or supplier informational signs in excess of that required by law shall be subject to approval by the Owner.
 - 1.6.10.1 As required by OSHA regulations 29 CFR 1926.1101, warning signs shall bear the following information:

DANGER ASBESTOS CANCER AND LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

- 1.6.10.2 Provide signs in English and Spanish in compliance with Texas Asbestos Health Protection Rules. Remove all signs upon completion of construction.
- **1.6.11 LABEL REQUIREMENTS:** Provide labels affixed to all asbestos waste containers.
 - 1.6.11.1 Warning labels as required by OSHA regulation 29 CFR 1926.1101 as follows:

DANGER ASBESTOS MAY CAUSE CANCER CAUSES DAMAGE TO LUNGS AUTHORIZED PERSONNEL ONLY

- 1.6.11.2 Informational labels as required by NESHAP regulation 40 CFR 61, Subpart M with the name of the waste generator and the location at which the waste was generated. If handwritten, use, at a minimum, indelible ink to legibly record the required information.
- **1.6.12 TRANSPORT SIGN REQUIREMENTS:** Provide signs during waste transport and disposal as follows:
 - 1.6.12.1 As required by the U.S. Department of Transportation, 49 CFR 171 and 172, warning signs shall display the following:

RQ HAZARDOUS CLASS 9 SOLID, NOS, ORM-E, NA 2212, III (ASBESTOS)

1.6.12.2 As required by NESHAP, 40 CFR 61, Subpart M, mark vehicles used to transport asbestos-containing waste material during the loading and unloading of the waste so that the signs are visible as follows:

DANGER ASBESTOS DUST HAZARD CANCER AND LUNG DISEASE HAZARD Authorized Personnel Only

1.7 PREWORK SUBMITTALS:

Within seven days prior to the Preconstruction Conference the Abatement contractor shall submit to the Consultant the following documents. Maintain one (1) approved copy at the job site.

- **1.7.1 PROGRESS SCHEDULE:** Provide proposed schedule using the bar graph method.
 - 1.7.1.1 Show the complete sequence of construction by activity and the sequencing of work within each phase of work.
 - 1.7.1.2 Show the dates for the beginning and completion of each major element (setup, removal, testing, etc.) of work, including substantial completion dates for each phase.
 - 1.7.1.3 Show projected percentage of completion for each item, as of the first day of each week.
 - 1.7.1.4 Show final inspection dates.
 - 1.7.1.5 The schedule shall be formulated on a day/week basis, updated weekly, and revised as required.
- **1.7.2 INSURANCE COVERAGE:** Submit copies of insurance coverage, including asbestos, automotive liability, worker's compensation, comprehensive general liability, special endorsement, and other coverage as required. Comply with the Owner's requirements for coverage.

Abatement contractor agrees to procure and maintain all insurance provided below on an occurrence basis, using carriers reasonably acceptable to Owner and carrying a Best's rating of not less than B, including insurance covering the obligations assumed by Abatement contractor. Such insurance shall be primary with respect to any other similar insurance available to Owner and affiliated companies, notwithstanding the provisions of such insurance. Before any part of the work on jobsite is commenced, Abatement contractor shall, at Abatement contractor's sole cost cause to be issued and maintained during the entire progress of the Work not less than the insurance coverage set forth below. The contractor shall provide proof of insurance for the Abatement Contractor, Asbestos Transporter, and Disposal Site. There shall be no right of subrogation against Owner and Consultant and this waiver of subrogation shall be endorsed upon all policies of insurance.

- 1.7.2.1 Automobile Liability insurance covering use of all owned, non-owned and hired vehicles used by or on behalf of the Abatement contractor, in connection with the work, with a combined bodily injury and property damage liability limits of not less than \$1,000,000 per occurrence to include transportation of hazardous materials with specific environmental impairment provisions, in addition to the MCS 90 Endorsement.
- 1.7.2.2 Occurrence based Asbestos Specific Liability insurance including coverage for obligations assumed in the agreement for an amount not less than \$1,000,000.00. Policy may not have asbestos exclusions. Worker's Compensation on a statutory basis and Employers Liability, including Occupational Disease, at limits of \$500,000.
- 1.7.2.3 The Abatement contractor and/or Subcontractor responsible for transporting the asbestos-containing and/or asbestos-contaminated material to an approved U.S. Environmental Protection Agency (EPA) or Texas Natural Resource Conservation Commission (TNRCC) disposal site,. The transporter shall meet the following minimum insurance requirements through insurers acceptable to Owner on an occurrence basis.
- 1.7.2.4 Commercial General Liability including asbestos and other pollution environmental coverage at limits of \$1,000,000 combined single limit.
- 1.7.2.5 Commercial Automobile Liability at limits of \$1,000,000 combined single limit including the MCS 90 Pollution Endorsement and the ISO Pollution Endorsement for Hazardous Materials.

- 1.7.2.6 Worker's Compensation on a statutory basis and Employers Liability, including Occupational Disease, at limits of \$500,000.
- 1.7.2.7 The disposal site shall meet the following minimum insurance requirements through insurers acceptable to Owner on an occurrence basis.
- 1.7.2.8 Commercial General Liability at limits of \$1,000,000 combined single limit.
- 1.7.2.9 Environmental Impairment Liability at limits of \$1,000,000.
- 1.7.2.10 Commercial Automobile Liability at limits of \$1,000,000, if applicable, to include hazardous materials.
- 1.7.2.11 Worker's Compensation on a statutory basis and Employers Liability, including Occupational Disease, at limits of \$500,000.
- **1.7.3 <u>NOTICES:</u>** Assist Owner with timely submission of notices required by federal, state, and local regulations.
- **1.7.4 <u>PERMITS</u>:** Submit copies of current valid permits required by state and local regulations, including arrangements for storage, transportation, and disposal of contaminated material. Dump site must conform to EPA regulation 40 CFR 61.
- **1.7.5** <u>LICENSES:</u> Submit copies of all state and local licenses and permits necessary to carry out the work, including DSHS Asbestos Abatement Contractor license.
- **1.7.6 <u>CONTAINMENT AREA:</u>** Show on Contract Drawings or an 8-1/2" x 11" plan the containment areas, including the locations and quantity of negative air pressure equipment, the location of all decontamination chambers, entrances, and emergency exists from the work areas.
- **1.7.7 STORAGE AND SECURITY:** Show on a plan the location and construction of storage facilities and field office and security provisions in and around the premises.
- **1.7.8** <u>EQUIPMENT:</u> Submit manufacturer's certification that vacuums, negative pressure equipment, respirators, and air supply equipment meet all requirements of OSHA and EPA. Include descriptions of any equipment to be employed not previously discussed.
- 1.7.9 **SAMPLES:** Submit samples of warning signs and warning labels.
- **1.7.10** WORKER TRAINING AND MEDICAL SURVEILLANCE: Submit copies of training certificates, DSHS licenses, medical examinations and fit tests for each worker and project superintendent.
- **1.7.11** Provide historical air monitoring data to substantiate the choice of respiratory protection.
- **1.7.12 LOGS**: Submit sample copies of daily progress log and visitors log.

<u>Visitors' Log</u>: The Abatement contractor shall maintain a visitors' log at the work place and require all persons entering the asbestos work area to sign the log. The log should provide space for the following information:

- 1.7.12.1 Name, organization represented, date, time, and purpose of visit.
- 1.7.12.2 Certificate of release signed and filed with abatement contractor that those who enter the work environment have been informed of the hazards of asbestos.

<u>Daily Log:</u> The abatement contractor shall maintain a daily job log which shall be maintained by the Project Superintendent. The log shall have daily entries describing

the progress and location of the work, any special conditions encountered, records of testing, amount removed, names of workers entering and exiting the containment areas, and any other pertinent data.

- **1.7.13 NOTICES TO SUPPLIERS:** Copies of notices sent to suppliers of rental equipment and vehicles informing them of the nature of the use of their equipment.
- **1.7.14 MATERIAL LIST:** Catalog cost of materials and items proposed to be furnished and used under this contract.
- **1.7.15** <u>SUBCONTRACTORS LIST:</u> Submit a list of all subcontractors to be used on the project. Any subcontractor must be acceptable to the Owner and the Consultant.
- **1.7.16** SCHEDULE OF VALUES: The Subcontractor shall submit a schedule of values. All applications for payment must include this form. The schedule of values must break down total amount of bid per removal area.
- **1.7.17 MATERIAL SAFETY DATA SHEET:** Submit a MSDS Sheet or equivalent for each material proposed for use on the work in accordance with the OSHA Hazard Communication Standard. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated and/or manufacturer's specification.

1.8 **PRODUCT SUBMITTALS**:

- **1.8.1 GENERAL:** Submit product data and samples required by Contract Documents. The abatement contractor shall be fully responsible for ensuring that the samples, materials, and equipment comply with the Specifications and for ensuring their suitability for use in the complete performance of his contract. Any deviations from the Contract Documents shall be boldly marked on the submittals by the abatement contractor for review by the Consultant. The Consultant shall review the submittals for general contract compliance only and does not accept any responsibility for the suitability of the products for proper functional use on the project.
- **1.8.2 PRODUCT DATA:** Includes standard printed information on manufactured products that has not been specially prepared for this project, including but not limited to the following items: manufacturer's product specifications, installation instructions, and catalog cuts.

Clearly mark each copy to identify pertinent products or models and show performance characteristics and capacities.

Product data submittals shall contain:

- 1.8.2.1 The date of submission and the dates of any previous submissions.
- 1.8.2.2 The project title and number.
- 1.8.2.3 The names of abatement contractor, superintendent, and manufacturer.
- 1.8.2.4 Identification of the product, with the specification section number.
- 1.8.2.5 Applicable standards, such as ASTM or Federal Specification numbers.
- 1.8.2.6 Identification of deviations from Contract Documents.
- 1.8.2.7 Identification of revisions or resubmittals.
- 1.8.2.8 Contractor's stamp, initialed or signed, certifying the review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract

Documents.

1.9 POST-JOB SUBMITTALS:

- **1.9.1** Three copies of the Daily Log and the Visitor's Log shall be submitted to the Consultant within fourteen days after completion of work.
- **1.9.2** Submit all copies of dump receipts and waste manifests signed by the landfill within thirty-five days following completion of the project.
- **1.9.3** Submittal Review:

1.9.3.1 Partial submittals may be rejected for non-compliance with the Contract Documents.

1.9.3.2 Review by Consultant does not relieve Abatement Contractor from responsibility for errors.

- 1.9.3.3 Make revisions when requested by Consultant and resubmit for review.
- 1.9.3.4 Subsequent Reviews: All cost associated with reviews required beyond the first review will be paid by Abatement Contractor.

1.10 TEMPORARY FACILITIES:

- **1.10.1** Provide and maintain temporary facilities required for abatement work, remove on completion of work.
- **1.10.2 REQUIREMENTS OF REGULATORY AGENCIES:** Comply with all applicable codes and regulations.

1.10.3 MATERIALS AND EQUIPMENT:

1.10.3.1 <u>GENERAL</u>: Provide new or used materials and equipment that are undamaged and in serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards.

1.10.4 SCAFFOLDS, LADDERS, ETC.:

- 1.10.4.1 Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type, or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
- 1.10.4.2 Equip rungs of all metal ladders, etc. with an abrasive nonslip surface.
- 1.10.4.3 Provide a nonskid surface on all scaffold surfaces subject to foot traffic.

1.10.5 GUARDRAILS, BARRICADES, AND COVERINGS:

- 1.10.5.1 Provide guardrails, handrails, and covers for floor, roof and wall openings and stairways.
- 1.10.5.2 Provide suitable temporary watertight coverings over openings as required to protect interior work from inclement weather.
- 1.10.5.3 Comply with requirements of all federal, state, and local authorities having jurisdiction for the protection of persons and property.

1.10.6 TEMPORARY SANITARY FACILITIES:

1.10.6.1 Existing toilet facilities at the site may not be used by the abatement contractor's personnel during performance of the work.

1.10.7 TEMPORARY FIRE PROTECTION:

- 1.10.7.1 Provide and maintain temporary fire protection during construction in accordance with requirements of the local protection code.
- 1.10.7.2 Provide Type "A" fire extinguisher for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguisher, or a combination of several extinguisher of NFPA recommended types for the exposures in each case.

1.10.8 TEMPORARY PROJECT SUPERINTENDENT'S FIELD OFFICE:

- 1.10.8.1 If desired, temporary offices may be provided by the abatement contractor. If temporary offices are provided, coordinate location of placement with the Owner and General Contractor.
- 1.10.8.2 Temporary offices provided by the abatement contractor shall be in a weather and watertight building or trailer, and shall be maintained in a neat, orderly appearance.
- 1.10.8.3 Arrange with utility companies to provide water and electricity for office as required. Pay all costs for meters, installation, maintenance, removal and service charges for utilities.

1.10.9 TEMPORARY STORAGE:

- 1.10.7.1 Provide required weatherproof storage sheds and maintain in good condition and neat appearance. Location of storage sheds and trailers shall be acceptable to the Owner.
- 1.10.7.2 Construct storage sheds on proper foundations, securely anchored in place.

1.10.10 EXECUTION:

- 1.10.8.1 Maintain and operate systems to assure continuous service.
- 1.10.8.2 Modify and extend systems as work progress requires.

1.10.11 SCAFFOLDING:

- 1.10.9.1 During the erection and/or moving of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged.
- 1.10.9.2 Maintain scaffolding free of accumulated debris during the work.

1.10.12 INSTALLATION, GENERAL:

1.10.12.1 Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the work.

1.10.13 REMOVAL:

1.10.13.1 Completely remove temporary materials and equipment when their use is no longer

required.

- 1.10.13.2 Clean and repair damage caused by temporary installations or use of temporary facilities.
- 1.10.13.3 Restore existing facilities used for temporary services to specified, or to original, condition.

2.0 EXECUTION

PART 1 - GENERAL

- 2.1 <u>SCOPE:</u> This section covers the removal of asbestos-containing materials. This work shall be done in strict accordance with the specifications. Compliance with all applicable Federal, State, and local regulations and the use of the best available technology, procedures, and methods for preparation, execution, cleanup, disposal, and safety are absolutely required. This compliance is the sole responsibility of the abatement contractor.
- **2.2 DESCRIPTION:** Furnish all labor, materials, services, insurance, and equipment in accordance with the most stringent requirements of TDSHS, EPA and OSHA and all other applicable regulatory agencies, to complete the removal of asbestos-containing materials.
- 2.3 **TERMINOLOGY** (Definitions):
 - **2.3.1 ABATEMENT:** Procedure to control fiber release from asbestos-containing building materials.
 - 2.3.1.1 <u>Removal</u> All herein specified procedures necessary to remove asbestos-containing materials from an area and dispose of the materials at an acceptable site in an acceptable manner.
 - 2.3.1.2 <u>Post-Removal Encapsulation</u> Procedures necessary to coat surfaces from which asbestos-containing materials have been removed to control any residual fiber release.
 - 2.3.1.3 <u>Abatement Activities</u> Any activity requiring respiratory protection as per this project manual which disturbs or has the potential to disturb any asbestos-containing building material. This includes, but is not limited to, the following activities: pre-cleaning, installing polyethylene, ACBM removal, encapsulation, and enclosure.
 - 2.3.2 ACBM OR ACM: Asbestos-containing building materials or asbestos-containing materials.
 - **2.3.3** <u>AIR LOCK:</u> A system for permitting ingress or egress without permitting air movement from a contaminated area into an uncontaminated area, typically consisting of two curtained doorways at least 3 feet apart.
 - **2.3.4** <u>AIR MONITORING:</u> The process of measuring the fiber content of a specific volume of air in a stated period of time. For PCM method, NIOSH Analytical Method 7400 shall be used. When aggressive air sampling is specified, blowers/fans are used to disperse settled fibers into the air during sampling. For TEM method, as described in 40 CFR 763, Subpart E (AHERA Protocol).
 - **2.3.5** <u>AMENDED WATER:</u> Water to which a surfactant has been added to reduce water surface tension and thereby provide a more rapid penetration.
 - **2.3.6** <u>AUTHORIZED VISITOR:</u> The Owner, the Consultant, or a representative of any regulatory or other agency having jurisdiction over the project.
 - **2.3.7 BARRIER:** Any surface which inhibits air and fiber movement from the work area to non-work areas. Can be comprised of, one or a combination of several materials, including but not limited to plywood, polyethylene sheeting and/or duct tape. A critical barrier is one which seals any opening (such as doorways, vents, windows, penetrations) between the work area and non-work area.

- **2.3.8** <u>CURTAINED DOORWAY:</u> Device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three overlapping sheets of opaque 6-mil polyethylene over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of the first and last sheets along one vertical side of the doorway and securing the middle sheet along the opposite vertical side of the doorway.
- **2.3.9 DECONTAMINATION ENCLOSURE SYSTEM:** A series of connected rooms, with air locks between any two adjacent rooms, for the decontamination of workers and/or materials and equipment, constructed or moved onto site.
- **2.3.10** EQUIPMENT DECONTAMINATION UNIT: Decontamination enclosure system for materials and equipment, typically consisting of a designated area or the work area, a washroom and a holding room.
- **2.3.11 <u>GROSS ABATEMENT AREA:</u>** An asbestos removal area which is sealed and fully contained in polyethylene. Workers enter the abatement area through a decontamination enclosure system.
- **2.3.12 PERSONNEL DECONTAMINATION UNIT:** A decontamination enclosure system for workers, typically consisting of a designated area of the work area for gross contaminant removal, an equipment room, an air lock, a shower, an air lock, and a clean room.
 - 2.3.10.1 <u>Equipment Room</u>: A contaminated area or room in the personnel decontamination enclosure system with provisions for storage of contaminated clothing and equipment.
 - 2.3.10.2 <u>Air Lock:</u> An area between rooms, with a movable barrier to allow access but maintain negative pressure.
 - 2.3.10.3 <u>Shower Room:</u> A room between the two air locks in the personnel decontamination enclosure system with hot and cold running water suitably arranged for complete showering during decontamination.
 - 2.3.10.4 Air Lock.
 - 2.3.10.5 <u>Clean Room:</u> An uncontaminated area or room which is part of the worker decontamination unit with provisions for storage of workers' street clothes and protective equipment.
- **2.3.13** FIXED OBJECT: A unit of equipment or furniture in the work area which cannot be removed from the work area without dismantling.
- **2.3.14** <u>HEPA FILTER:</u> A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.
- **2.3.15** <u>**HEPA VACUUM EQUIPMENT:**</u> High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers greater than 0.3 microns in length.
- 2.3.16 <u>NEGATIVE AIR PRESSURE EQUIPMENT:</u> A local exhaust system, capable of maintaining a constant, low velocity air flow through the Decontamination Unit and into the Work Area from adjacent uncontaminated areas and exhausting that air outside the building through HEPA filters.
- 2.3.17 <u>NIOSH:</u> National Institute for Occupational Safety and Health.
- 2.3.18 <u>PLASTICIZING</u>: Procedures necessary using polyethylene sheeting, adhesives, and/or taping to seal an area airtight. All polyethylene sheeting shall be certified by the Underwriters Laboratory as being fire retardant.

- **2.3.19 POST REMOVAL ENCAPSULATION:** Application of liquid material to surfaces from which asbestos-containing materials have been removed to control the possible release of residual asbestos fibers, either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components (penetrating encapsulant).
- **2.3.20 SURFACTANT:** A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- **2.3.21** <u>WASTE GENERATOR:</u> Any owner or operator of a source covered by NESHAP regulations whose act or process produces asbestos-containing waste.
- 2.3.22 <u>WASTE SHIPMENT RECORD (WSR):</u> The shipping document, required by 40 CFR 61, Subpart M, to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste.
- **2.3.23** <u>WET CLEANING/WIPING:</u> The process of eliminating contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as asbestos-contaminated waste.

2.4 EXISTING CONDITIONS:

2.4.1 Owner and abatement contractor shall agree in writing on building and fixture condition prior to commencement of work. It shall be the Contractor's responsibility to replace or repair to the Owner's satisfaction, prior to closeout of the project, all damaged items caused by the Contractor and not proven otherwise. All items damaged prior to abatement shall be noted during preconstruction walk-through.

PART 2 - EQUIPMENT AND MATERIALS

2.5 PERSONNEL PROTECTION REQUIREMENTS:

- **2.5.1** Prior to commencement of work, the workers shall be instructed and shall be knowledgeable on the hazards of asbestos exposure, use and fitting of respirators, protective clothing, decontamination procedures, and all aspects of asbestos work procedures; workers shall have medical examinations and fit tests.
- 2.5.2 The abatement contractor acknowledges that he alone is responsible for enforcing personnel protection requirements and that these specifications provide only a minimum acceptable standard for each phase of operation. The Certificate of Worker's Release Form included in the attachments shall be signed by each worker.
- **2.5.3** Provide workers with personally issued and marked respiratory equipment approved by NIOSH and accepted by OSHA.
- **2.5.4** Provide extra respiratory equipment for authorized visitors.
- **2.5.5** Respirator selection shall be based on the following table:

RESPIRATOR SELECTION	MAXIMUM USE CONCENTRATION
Half-Face Air-Purifying With HEPA Filters	0.1 f/cc
Full-Face Air-Purifying With HEPA Filters	0.5 f/cc
Powered Air-Purifying	0.5 f/cc

(PAPR) Full-Face With HEPA Filter

Full-Face Supplied Air, Pressure Demand + HEPA escape 10 f/cc

- Note: The Maximum Use Concentration represents the maximum fiber concentration outside the respirator to maintain exposure inside the respirator below 0.01 f/cc.
- **2.5.6** Supplied air shall be grade D in compliance with 29 CFR 1910.134, Compressed air system shall incorporate a continuous carbon-monoxide monitoring device, in-line purifying absorbent beds and filters to deliver air free of water, oil, odors, vapors, and particulates, a compressor failure alarm, high-temperature alarm, high-pressure automatic air storage within an ASME certified air bank to provide sufficient air supply for decontamination in the event of a system failure. Abatement contractor shall comply with all applicable codes and regulations that apply to the operation of such system.
- 2.5.7 WHERE NOT IN VIOLATION OF NIOSH AND OSHA REQUIREMENTS, THE CONTRACTOR SHALL PROVIDE, AS A MINIMUM, THE FOLLOWING RESPIRATORY PROTECTION FOR EACH PHASE OF OPERATION:
 - 2.5.7.1 <u>Precleaning/Wet Wiping of Area:</u> NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.2 <u>Polyethylene Installation:</u> NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.3 <u>Asbestos Gross Removal and Cleanup:</u> NIOSH full-face or PAPR respirators equipped with HEPA cartridges, or full-face supplied air, pressure demand respirators.
 - 2.5.7.4 <u>Asbestos Removal Glovebag:</u> NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.5 <u>Non-Friable ACBM Removal:</u> NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.6 <u>Polyethylene Removal (after Final Clearance)</u>: NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.7 <u>Loading Waste Material on Truck (outside work area)</u>: NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
 - 2.5.7.8 <u>Unloading Bags at Landfill</u>: NIOSH half-face dual cartridge respirators equipped with HEPA cartridges.
- **2.5.8** The above schedule is minimum respiratory protection acceptable. Should any condition, for any reason, be encountered where the exposure level, after application of the appropriate protection factor of the respiratory equipment in use, exceeds 0.01 f/cc, substitute respiratory equipment with protection factors which reduce worker exposure levels below 0.01 f/cc. Should any such condition come to the Consultant's attention, the right is reserved to require the use of respiratory equipment with higher protection factors for any or all phases of the work.
- **2.5.9** No visitors shall be allowed in work areas, except as authorized by the Consultant. Provide authorized visitors with suitable respirators whenever they are required to enter the work area.
- **2.5.10** When supplied air respirators are being used, one (1) open airline shall be maintained at all times for the Consultant's use.
- 2.5.11 Provide workers with sufficient sets of disposable protective full-body clothing. Such clothing shall

consist of full-body coveralls, footwear, and head gear, one-piece coveralls or equal. Provide eye protection and hard hats as required by applicable safety regulations. Reusable type protective clothing and footwear intended for reuse shall be left in the Contaminated Equipment Room until the end of the asbestos abatement work at which time such items shall be disposed of as asbestos waste. Disposable clothing shall not be allowed to accumulate and shall be disposed of as contaminated waste.

2.5.12 Provide authorized visitors with suitable protective clothing, headgear, footwear, and gloves as described above whenever they are required to enter the work area.

2.6 MATERIALS:

- **2.6.1** Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
 - 2.6.1.1 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
 - 2.6.1.2 Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with applicable regulations.
- 2.6.2 **POLYETHYLENE SHEETING:** Floor sheeting with at least a dart impact of 270 grams and tear resistance of machine direction 512 grams and transverse direction of 2067 grams, or at least 6-mil true thickness for floors, and 4-mil for walls, in sizes to minimize the frequency of joints. Where a fire hazard exists, all polyethylene sheeting shall be certified by the Underwriters Laboratory as being fire retardant.
- **2.6.3 <u>TAPE:</u>** Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water. Duct tape, poly prep tapes or approved equal.
- **2.6.4 ADHESIVES:** Capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water.
- **2.6.5 SURFACTANT:** Shall consist of 50% polyoxyethylene ether and 50% of polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one ounce of surfactant to 5 gallons of water. Prior to bidding, the Contractor shall be responsible for verifying that this surfactant is compatible with the materials to be removed and their substrates. If found to be incompatible, the Contractor shall supply suitable wetting agents at no extra cost to the Owner.
- 2.6.6 <u>IMPERMEABLE CONTAINERS:</u> Suitable to receive and retain any asbestos-containing or contaminated materials until disposal at an approved site. The containers shall be labeled in accordance with regulations. Containers must be both air and water tight and must be resistant to damage and rupture. An impermeable container shall be: 2 (two) 6-mil polyethylene bags or 1 (one) 6-mil polyethylene bag inside a drum with tightly fitting lid. Bags may be true 6-mil thickness, or have a tear resistance of M.D. 300 grams, T.D. 2,068 grams, and dart impact of 216 grams.
- 2.6.7 WARNING LABELS AND SIGNS: As required by regulations.
- 2.6.8 <u>GLOVEBAGS:</u> Manufactured device consisting of a bag constructed of 6-mil or thicker transparent polyethylene, two inward projecting long sleeve gloves, one inward projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for collection of removed asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal

process.

- **2.6.9 ENCAPSULANTS:** A liquid material which, when applied, controls the possible release of asbestos fibers either by creating a membrane over the surface or by penetrating the material and binding its components together. The encapsulant shall be a commercial product which is color-tinted.
- **2.6.10** <u>OTHER MATERIALS:</u> Provide all other materials, such as, but not limited to lumber, plywood, nails, and hardware, which may be required to properly prepare and complete this project.

2.7 TOOLS AND EQUIPMENT:

- **2.7.1** Provide suitable tools for asbestos removal.
 - 2.7.1.1 <u>Water Sprayer:</u> Airless or a low pressure sprayer for amended water application as applicable.
 - 2.7.1.2 <u>Air-Purifying Equipment:</u> High Efficiency Particulate Air Filtration Systems (HEPA) shall comply with ANSI Z9.2-79. No air movement system or air equipment should discharge unfiltered air outside the work area. Thus, the negative air unit shall be equipped with a three filter bank with the last being the HEPA filter capable of removing 99.97% of fibers >0.3 microns.
 - 2.7.1.3 <u>Paint/Encapsulant Sprayer:</u> Airless or a low pressure sprayer.
 - 2.7.1.4 <u>Scaffolding</u>: As required to accomplish the specified work and meet all applicable safety regulations.
 - 2.7.1.5 <u>Vacuums:</u> Use HEPA filtered type.
 - 2.7.1.6 Other tools and equipment as necessary.

2.8 **POSTING OF THE PROJECT:**

Post warning signs in and around the work area to comply with OSHA regulation 29 CFR 1926.1101 and in compliance with all other Federal, State, and local requirements.

2.9 WORK AREA PREPARATION - OWNER:

- **2.9.1** The Contractor, in coordination with the Owner, shall shut down electric power to work areas. Electrical shutdown shall be coordinated with the Owner no less than seven Calendar days prior to the scheduled shutdown. The Contractor may use existing electrical service to the building for temporary electrical power during abatement work.
- **2.9.2** The Contractor, in coordination with the Owner, shall shut down or isolate heating, cooling and ventilating air systems to the work areas.
- **2.9.3** Before the work is begun, and unless otherwise specified, the Owner shall remove from work areas all removable items and equipment not located on the asbestos material as specified. Owner shall later replace furniture and movable objects.
- 2.10 WORK AREAS PREPARATION CONTRACTOR: Prior to commencing abatement work the Abatement Contractor shall prepare the work area as required by this specification and applicable regulations.
 - **2.10.1** Pre-clean fixed objects within the work area, first using HEPA vacuum equipment and then wet cleaning methods as appropriate, and completely enclose with minimum 6-mil thick plastic sheeting sealed with tape.

- **2.10.2** Prior to commencing abatement work, shut down and isolate heating, cooling, and ventilating air systems to prevent contamination and fiber dispersal to other areas of the building. Seal vents within the work area with tape and 6-mil plastic sheeting.
- **2.10.3** Clean the work area first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not use HEPA vacuum equipment on wet surfaces unless units are specially constructed for wet/dry use. Do not use amended water on gypsum board or other material which would be damaged by the wetting agent. HEPA vacuuming or damp sponge with regular water would be appropriate.
- **2.10.4** Seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, diffusers, porous surfaces, and any other penetrations of the work areas, with 6-mil polyethylene sheeting sealed with tape. Open doorways and corridors with direct access to occupied areas shall be sealed with plywood in addition to the polyethylene barriers as described in this section.
- 2.10.5 Cover floor first and then wall surfaces with plastic sheeting completely sealed with tape at all edges with adhesive and tape at all joints. Use a minimum of two layers of 6-mil plastic on floors and all fixed horizontal surfaces. Cover floors first so that plastic extends at least 12 inches up on the walls, then cover walls with a minimum of two layers of 4-mil plastic sheeting which shall extend beyond wall/floor joints at least 12 inches. No seams shall be located at wall-to-floor joints. All polyethylene sheeting shall be certified by the Underwriters Laboratory as being fire retardant.
- **2.10.6** Install additional protection as necessary for floor finishes such as carpet and wood. The abatement contractor shall assume responsibility for all damage to floor finishes which occurs during the construction period.
- **2.10.7** Provide viewing windows as required by TDSHS Regulations.
- **2.10.8** Build decontamination enclosure systems at the entrances to the work area.
- **2.10.9** All power supplied to the work area shall be GFCI protected.
- **2.10.10** Install negative air equipment.
- **2.10.11** Maintain and mark emergency exits from the work areas, or establish alternate exits satisfactory to the local fire marshal.

2.11 DECONTAMINATION ENCLOSURE SYSTEMS:

- **2.11.1** <u>GENERAL:</u> The abatement contractor shall use portable decontamination units acceptable to EPA and OSHA, connected to the work area with framed-in or accordion tunnels, if necessary, and line the tunnels with plastic, sealed with tape at all joints in the plastic, or shall construct decontamination units on-site.
- **2.11.2** <u>ACCESS:</u> In all cases, access between any two rooms within the decontamination enclosure systems shall be through an air lock.
- **2.11.3** <u>WORKER DECONTAMINATION UNIT:</u> Construct or provide a worker decontamination unit contiguous to the work area consisting of three totally enclosed chambers as follows:
 - 2.11.3.1 An equipment room with two curtained doorways, one to the work area and one to the shower room via an air lock.
 - 2.11.3.2 A shower room with two curtained doorways, one to the equipment room and one to the clean room, via air locks. The shower room shall contain at least one shower per eight (8) workers with hot and cold or warm water with individual shut-off valves inside the

showers. Careful attention shall be paid to the shower enclosure to insure against leakage of any kind. Drainage from showers shall be disposed of as contaminated water or filtered as specified below.

- 2.11.3.3 Waste water containing asbestos, including drainage from decontamination showers, shall be either disposed of as contaminated waste or filtered through 5 micron filters prior to introduction into the sanitary sewer system.
- 2.11.3.4 A clean room with one curtained doorway into the shower via an air lock and one entrance or exit to non-contaminated areas of the building. The clean room shall have sufficient space for storage of the workers' street clothes, towels, and other non-contaminated items.
- 2.11.4 <u>EQUIPMENT DECONTAMINATION UNIT:</u> Provide or construct an equipment decontamination enclosure system consisting of two totally enclosed chambers as follows:
 - 2.11.4.1 A washroom constituting an air lock, with a curtained doorway to a designated area of the work area and a curtained doorway to the holding room.
 - 2.11.4.2 A holding room, constituting an air lock, with a curtained doorway to the wash room and a curtained doorway to the uncontaminated area.
 - 2.11.4.3 Contractor may elect to construct equipment de-con unit on side of equipment room of worker decontamination unit.

2.12 SEPARATION OF WORK AREAS FROM NONWORK AREAS:

- **2.12.1** Temporary barriers from corridors, doorways, and cased openings not to be used for passage during abatement shall be sealed with wood or metal studs, 16 inches o.c., faced with 3/8" plywood sheathing on the work area side only. Cover both sides of the partition with 6-mil polyethylene sheeting. Edges of the partition at floors, walls, and ceilings shall be taped air tight.
- **2.12.2** Separation of work areas adjacent to occupied areas shall require a barrier as described above.
- **2.12.3** Visual separation shall be accomplished at all "see-through" locations using opaque polyethylene. This separation shall not be incorporated within the other seals involved on this project. Provide viewing windows as specified by TDSHS.

2.13 MAINTENANCE OF DECONTAMINATION ENCLOSURES:

- **2.13.1** At the beginning of each work shift and throughout removal, all seals and curtained doorways shall be inspected, and if not found in proper condition, repaired immediately.
- 2.13.2 Respiratory equipment shall be cleaned, repaired, and sanitized after each use.
- **2.13.3** Soap and shampoo shall be in the showers at all times.
- **2.13.4** Fresh towels shall be available at all times.
- **2.13.5** All areas shall be kept clean and in order.
- **2.13.6** Provide a disposal bag for contaminated filters in the shower room.
- **2.13.7** Provide storage for wet and dry towels.
- 2.13.8 Ensure that the drainage filtering systems are kept clean an operable at all times.
- 2.13.9 At the end of each decontamination period, the shower, air locks, and clean room shall be cleaned

and dried.

2.13.10 At the end of each work shift: the two air locks and the shower shall be thoroughly disinfected; the filter bag (if applicable) shall be returned to the equipment room for disposal; the equipment room and first air lock shall be thoroughly HEPA vacuumed and wet cleaned.

2.14 WORKER PROTECTION:

- **2.14.1** All workers and authorized personnel, in order to enter the work area, shall:
 - 2.14.1.1 Remove all clothing, unless it is to remain in the equipment room for eventual disposal.
 - 2.14.1.2 Don protective clothing (coveralls, gloves, boots, safety harness, etc.), as deemed necessary by the contractor's supervisor or safety officer.
 - 2.14.1.3 Don the appropriate respiratory protection, following all training procedures and manufacturer's instructions. Hood shall be worn over respirator straps.
- 2.14.2 All workers and authorized personnel, in order to leave the work area, shall:
 - 2.14.2.1 Remove gross (visible) contamination from themselves and their equipment.
 - 2.14.2.2 Enter the equipment room and, keeping respirator in place, remove all protective clothing, including gloves and boots. Place contaminated clothing in the bag(s) provided. Store gloves and/or boots in their respective areas.
 - 2.14.2.3 Still wearing the respirator, proceed naked to the first air lock. Once inside, ensure all curtained doorways behind are properly closed.
 - 2.14.2.4 Respirator still in place, move into the shower room and <u>rinse</u> off thoroughly. If wearing dual cartridge respirators, make sure the cartridges are completely soaked before removing the respirator and disposing of cartridges in the container provided.
 - 2.14.2.5 Complete showering, thoroughly soaping, and shampooing.
 - 2.14.2.6 Proceed to the clean room, dry off, dress, and return respirator to the storage area.
 - 2.14.2.7 No smoking, eating or drinking shall be allowed inside decontamination enclosures.

2.15 COMMUNICATIONS:

2.15.1 Provide an electronic communications system suitable for inside or outside, and inter-room communications, in order to monitor all activities within the work area and to readily transfer messages from one location to another.

2.16 FIRE EXITS:

2.16.1 Designate and maintain emergency and fire exits from the work area in accordance with local codes and regulations. All exits shall be clearly marked with fluorescent tape or red enamel and shall be clearly visible from any part of the work area.

2.17 SECURITY

2.17.1 Make all necessary provisions for 24 hour building security for areas designated for this project. The abatement contractor shall be responsible for maintaining security of the abatement areas throughout the contract period.

2.18 LOCATION AND ACTIVATION OF NEGATIVE AIR PRESSURE:

- **2.18.1** Maintain negative pressure in the work areas during all asbestos abatement work for which abatement techniques are specified, or as required by the owner.
- **2.18.2** As a guideline, use the EPA document, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, June 1985.
- **2.18.3** Provide one spare negative air unit per site at all times. Spare exhaust units shall be of the same size and capacity as the largest operating units.
- **2.18.4** Suspend electrical cords off of the floor and out of workers' way to protect the cords from damage from traffic, sharp object, and pinching. Do not fasten cords with staples, and do not hang cords from nails or suspend with wire.
- **2.18.5** Provide sufficient number of negative air units in the work area to provide scrubbing of the air in the work area.
- **2.18.6** Locate units so that make-up air enters the work area primarily through the decontamination facility and traverses the work area as much as possible. Use section J.3 of the EPA Document, Guidance for Controlling Friable Asbestos-Containing Materials in buildings, "Purple Book", June 1985.
- **2.18.7** Provide additional make-up air openings as shall be necessary to effectively move air through the work area and to avoid creating too high a pressure differential that would damage or cause "blow-in" of temporary barriers and plastic coverings. Provide inlets by making openings in the plastic sheeting near the ceiling and as far as possible from the exhaust units. Provide self-closing polyethylene flaps over the openings to prevent backflow of air from the contained area to the outside.
- **2.18.8** Provide minimum number of auxiliary make-up air openings to maintain negative pressure. A negative pressure in excess of 0.02 inches of water differential, as measured by manometric measurements, shall be maintained.
- **2.18.9** Vent all exhaust units to the outside of the building at locations acceptable to the owner. Provide flexible or rigid duct as necessary to provide exterior venting and proper location of exhaust units. Ducts shall be completely sealed, in good repair, and protected from possible damage within the work area.
- **2.18.10** After the work area has been prepared, the decontamination set up, and the exhaust units installed, start the units (one at a time if more than one is provided). Visually check the direction of air movement through the openings in the barriers, and verify movement of air in all locations of the work areas by use of ventilation smoke tubes. Adjust the location of exhaust units, or provide additional exhaust units for the work area if the test indicates inadequate or improper air movement.
- **2.18.11** After removal is underway maintain operation of exhaust units continuously to maintain a constant negative pressure until decontamination of the work area is complete. Do not turn units off at the end of the work shift or when removal operations temporarily stop.
- **2.18.12** Change filters in exhaust units in accordance with manufacturer's recommendations and paragraph J.3.22.1 of the EPA document, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, "Purple Book", June 1985 or when there is obvious loss of negative pressure.
- **2.18.13** When a final inspection and the results of the final air monitoring tests indicate an acceptable level of airborne fibers, remove and dispose of pre-filters and shut off the exhaust units. If the exhaust units are to be used in another work area leave the final filter in place and seal all intake openings to the unit to prevent contamination due to asbestos fibers collected on the final filter. If the

exhaust units are not to be used in other work areas, remove the final filter and dispose of as contaminated waste.

- **2.18.14** If dismantling operations result in visible dust on surfaces, replace filters, restart exhaust units, reclean surfaces and perform additional area air monitoring (At abatement contractor's expense) until the level of airborne fibers is acceptable as specified.
- **2.18.15** Dispose of all filters as asbestos-contaminated waste material as specified.

2.19 EQUIPMENT REMOVAL PROCEDURES:

- **2.19.1** Clean external and internal surfaces of all nonfixed equipment and/or objects by thoroughly wet wiping and/or rinsing, before moving such items into the Equipment Decontamination Unit for final cleaning and removal to uncontaminated areas.
- **2.19.2** Objects and equipment removed shall be stored in areas designated by the Owner.

2.20 PREWORK INSPECTIONS:

- **2.20.1** All abatement work areas must be prepared by installing polyethylene barriers, negative air pressure, etc. as outlined in previous sections of this specification. Upon completion of all work area preparation and four hours before work is to begin, notify Consultant that the work area is ready for inspection.
- **2.20.2** The abatement contractor shall not begin abatement work until the Consultant has inspected the area and any deficiencies have been corrected. Abatement work in accordance with the requirements in the following sections may proceed after the Consultant has approved the work area preparation.

2.21 GROSS REMOVAL OPERATIONS:

- **2.21.1** Spray asbestos-containing material with water, using spray equipment capable of providing a "mist" application to reduce the release of fibers. Saturate the material sufficiently to wet it to the substrate without causing excessive dripping. Remove the saturated asbestos material in small sections from all areas. All asbestos-containing material shall be removed thoroughly and totally. No asbestos-containing material is to remain for any reason.
- **2.21.2** Insulation on pipes and other thermal system insulation to be abated within gross removal areas shall be removed using gross removal methods outlined in this section.
- **2.21.3** Provide shoring, bracing, and support as required to maintain structural integrity of materials and systems. Provide protection for other portions of project and protection from the elements. Protect existing electrical and electronic systems, cabling, and other components during all phases of abatement.
- **2.21.4** Install additional polyethylene barriers as needed during and after removal, in order to protect surfaces and maintain negative air pressure. After removal of ceilings, extend wall polyethylene sheeting to deck above. Monitor negative pressure as the work progresses to evaluate the need for additional barriers and/or negative air equipment.
- **2.21.5** Material shall not be allowed to dry before placing in 6-mil polyethylene bags. Any contaminated material capable of puncturing the polyethylene bags shall be packaged separately in 6-mil polyethylene sheeting sealed with tape and/or glue, or fiberboard drums.
- **2.21.6** Maintain work areas free of accumulated asbestos-containing materials by bagging waste throughout the shift. Keep waste materials wet until sealed in polyethylene bags.
- 2.21.7 Seal polyethylene bags air tight. Ensure that all contaminated materials, including insulation

materials exposed by ceiling demolition, are bagged or wrapped to yield a minimum covering of two polyethylene layers, or sealed in fiberboard drums before removal from the work area. Bags may be true 6-mil thickness, or have a tear resistance of M.D. 300 grams, T.D. 2,068 grams, and dart impact of 216 grams as required by the TDSHS.

2.21.8 Ensure that all disposal containers are properly labeled in accordance with regulations.

2.22 GLOVEBAG REMOVAL OPERATION:

- **2.22.1** Preclean work area using HEPA vacuum and/or wet cleaning methods.
- **2.22.2** Abatement Contractor shall be required to arrange equipment to protect it with sealed polyethylene sheeting tape and/or adhesive.
- **2.22.3** Protect the floor under the work area with 6-mil polyethylene sheeting, tape and/or adhesives. As a minimum, extend polyethylene two feet horizontally in all directions for each vertical foot from floor to material height.
- **2.22.4** For multiple glovebags to be used on damaged and/or friable materials, seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grilles, diffusers, and any other penetrations of the work areas, with a minimum of two layers of 6-mil polyethylene sealed with tape.
- **2.22.5** For the conditions discussed in 2.22.4, install negative air units in the work area to provide one (1) air exchange every fifteen (15) minutes.
- **2.22.6** If fiber levels found on the personal samples during glovebag removal exceed 0.01 f/cc and methods to reduce the excess prove futile, the abatement contractor shall remove the insulation under gross removal conditions at the discretion of the Consultant.
- 2.22.7 Install a two (2) room dry decontamination unit for the workers, materials and equipment.
- **2.22.8** Using glovebags, workers in full protective body clothing and respirators may begin removal of insulation as per the following, and/or manufacturer's instructions and OSHA requirements. In case of conflict, the more stringent provisions shall apply:
 - 2.22.8.1 At least two workers shall be assigned to each glovebag.
 - 2.22.8.2 Cut the sides of the glove bag to fit the size of area to be worked on and insert the tools into the attached tool pocket.
 - 2.22.8.3 Attach the glovebag to the working area by folding the open edges together and sealing with staples and/or tape. Any additional support which may be necessary to support the weight of the debris shall be provided.
 - 2.22.8.4 Seal the edges of the glovebag around the working area with tape or adjustable straps to form a tight seal. Slice open the side port to allow entry of the wetting tube and HEPA vacuum hose. Insert the nozzle from the portable sprayer, seal around it with tape, and thoroughly wet the area to be removed.
 - 2.22.8.5 Insert arms into the armholes and gloves and proceed to remove the asbestos from the elbow, valve fitting, pipe, or other surface. At locations where the insulation rests directly on pipe hangers or supports, the abatement contractor shall resupport the pipe by shimmying with wood blocks or other suitable materials. Continue wetting the material as required. Thoroughly wet the remaining pipe and insulation and wash down the inside of the glovebag. Scrub or brush any remaining suspect insulation material from the pipe or fitting.

- 2.22.8.6 The tools shall be pulled through one of the glove inserts, thus turning the gloves inside-out. Twist, tape around the twist, and cut through the tape to remove the glove with the tools. This glove may then be placed into the next glovebag. When glovebag operations are complete, clean tools by cleaning any residual materials from tools and disposing of glovebag and water as contaminated waste.
- 2.22.8.7 When the job has been completed, remove the spray nozzle, insert the HEPA vacuum nozzle, and turn on the HEPA vacuum to remove air from the bag. With the air removed from the glovebag, squeeze the bag tightly as close to the top as possible and twist seal and tape to keep the asbestos material safely at the bottom of the bag. Turn off the HEPA vacuum, remove the hose from the side port, and seal the side port with tape.
- 2.22.8.8 Cut and remove the glovebag from the working area and place it into another plastic bag. Move bags to holding area or disposal storage unit.
- 2.22.8.9 Mist surface of protective polyethylene and carefully fold inward. Proceed to HEPA vacuum the work area for any residual materials and seal the exposed edges and piping with the proper encapsulant sealants.

2.23 'CUT AND WRAP' TSI REMOVAL:

- **2.23.1** Remove from work areas all removable items, and equipment located adjacent to the pipe or ductwork. Use localized water spraying and HEPA vacuum equipment to minimize fiber dispersal. Decontaminate fixtures by wet wiping and HEPA vacuuming and store on site at locations designated by the Owner.
- **2.23.2** Install critical barriers at entry doors, with appropriate asbestos warning tape and signage to prevent entry of unauthorized personnel.
- **2.23.3** Cut points shall be identified along the pipe/duct to be removed. Glovebags shall be utilized at the cut points to allow cutting of the pipe without disturbance of the insulation and wrap at adjacent areas.
- **2.23.4** Comply with the regulatory requirements for glovebag removal and those outlined in section 2.22.
- **2.23.5** Wrap insulation to remain with two layers of 6-mil polyethylene sheeting at a minimum, so that insulation is not disturbed during cutting and transfer of cut sections to storage container.
- **2.23.6** Cut sections shall be covered with 6-mil polyethylene sheeting sealed with tape and/or glue and labeled prior to removal from the work area.
- **2.23.7** Maintain work areas free of accumulated asbestos-containing materials at all times. Keep waste materials wet until sealed in polyethylene bags.
- **2.23.8** Seal polyethylene bags air tight. Ensure that all contaminated materials are bagged or wrapped to yield a minimum covering of two polyethylene layers (double-bagged), or sealed in fiberboard drums before removal from the work area.
- 2.23.9 Ensure all disposal containers are properly labeled in accordance with regulations.

2.24 FLOOR COVERING REMOVAL:

- **2.24.1** Pre-clean the work area by first using HEPA-vacuum equipment, then wet cleaning methods until the area is visibly free of dust and debris.
- **2.24.2** Post warning signs which comply with the regulations.

- **2.24.3** Establish a negative pressure enclosure in the work area utilizing critical barriers at all openings and porous surfaces including ceiling panels. Install a decontamination unit; polyethylene sheeting on walls; and negative air pressure equipment. Install 'splashguards' consisting of a minimum of one layer of 4-mil polyethylene sheeting to a height of four feet on walls in the work area.
- **2.24.4** Remove carpeting or other non-ACM cover to expose vinyl floor covering. If tile or mastic adheres to carpet then handle and dispose as ACM.
- **2.24.5** Wet materials to be removed with water to control dust. Take precautions to contain water within the work area and prevent damage to areas outside the work area. Mist the work area and keep materials wet during removal until bagged for disposal.
- **2.24.6** Remove mastic using approved chemical mastic remover. No sanding is allowed. Floor coverings must be assumed to be multi-layered. All layers must be considered ACM or asbestos-contaminated, and shall therefore be removed.
- **2.24.7** Dispose of removed materials including tile, floor leveling compound and mastic as asbestoscontaining waste in double 6-mil plastic bags.
- **2.24.8** Dispose of chemical mastic remover as per manufacturer's instructions, Federal, State and local regulations.
- **2.24.9** Removal of floor coverings utilizing the RFCI methods must comply with the requirements of published Resilient Floor Covering Institute methodologies, and also requires the approval of the Project Consultant. Otherwise, use the methods outlined in this section.

2.25 WINDOW CAULKING/GLAZING REMOVAL

- **2.25.1** Take all cautions necessary to ensure there is no asbestos contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with asbestos-containing materials due to poor work practices, the Contractor shall immediately clean them utilizing wet cleaning and HEPA vacuum methods.
- **2.25.2** Establish a controlled work area at least five feet away from the edge of the material to be abated with barricade tape and appropriate signage.
- **2.25.3** Cover the sill, or other horizontal structure beneath the window with one layer of six mil polyethylene sheeting. Cover the ground beneath the window outward from the wall to a distance of one foot for each foot of material height.
- **2.25.4** Remove the caulking from the glazing using wet methods. Remove entire window frame if approved by the Owner.
- **2.25.5** Place asbestos containing materials in six mil polyethylene disposal bags, or wrap entire window prior to disposal.
- **2.25.6** Provide a temporary seal for the opening created in the structure by installing plywood or other weather tight material if required by the Owner and/or the General Contractor.
- **2.25.7** Upon completion of removal, inspect the work area and adjacent areas for any ACM debris. Bag and dispose of properly. Clean area utilizing HEPA vacuums and wet methods.
- 2.25.8 During each work shift, remove only the quantity specified by the Owner/General Contractor.
- **2.25.9** Material shall not be allowed to dry before being wrapped in in 6-mil polyethylene sheeting or bags. Any contaminated material capable of puncturing the polyethylene bags shall be packaged separately.

- **2.25.10** Maintain work areas free of accumulated asbestos-containing materials at all times. Keep waste materials wet until sealed in polyethylene bags or sheeting. Clean area beneath work area utilizing HEPA vacuums and wet methods at end of each shift.
- **2.25.11** Seal polyethylene bags air tight. Ensure that all contaminated materials are bagged to yield a minimum covering of 6-mils before removal from the work area.
- **2.25.12** Ensure all disposal containers are properly labeled in accordance with regulations. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities (including EPA regulations, AHERA, NESHAP, TDSHS and OSHA) which bear on performance of work and disposal of ACM.

2.26 EXTERIOR WALL VAPOR BARRIER REMOVAL

- **2.26.1** Take all cautions necessary to ensure there is no asbestos contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with asbestos-containing materials due to poor work practices, the Contractor shall immediately clean them utilizing wet cleaning and HEPA vacuum methods.
- **2.26.2** Establish a controlled work area at least twenty feet away from the edge of the material to be abated with barricade tape and appropriate signage.
- **2.26.3** Remove outer layer of brick leaving inner wall and mastic coating intact. Keep non-ACM debris segregated from debris with vapor barrier coating.
- **2.26.4** Upon completion of demolition to expose vapor barrier, inspect the work area and adjacent areas for any ACM debris. Bag and dispose of properly.
- **2.26.5** Spray asbestos-containing vapor barrier coating with water, using spray equipment capable of providing a "mist" application to reduce the release of fibers. Wet the material without causing excessive dripping. Demolish wall with vapor barrier while wet.
- **2.26.6** Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to areas acceptable to the Owner. If additional storage is necessary, obtain and pay for such storage off-site.
- **2.26.7** Material shall not be allowed to dry before loading into appropriate dumpsters with a lining of 6-mil polyethylene sheeting taped and glued in place. Ensure that all contaminated materials are wrapped/covered with polyethylene sheeting before removal from the site.
- 2.26.8 Maintain work areas free of accumulated asbestos-containing materials at all times.
- **2.26.9** Ensure all disposal containers are properly labeled in accordance with regulations. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities (including EPA regulations, AHERA, NESHAP, TDSHS and OSHA) which bear on performance of work and disposal of ACM.

2.27 EXTERIOR CEMENTITIOUS WALL PANEL REMOVAL

- **2.27.1** Take all cautions necessary to ensure there is no asbestos contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with asbestos-containing materials due to poor work practices, the Contractor shall immediately stop removal work and clean affected areas utilizing wet cleaning and HEPA vacuum methods.
- **2.27.2** Establish a controlled work area at least twenty feet away from the edge of the exterior wall to be abated with barricade tape and appropriate signage.
- 2.27.3 At the interior, enclose the backside of the wall panel to be removed with two layers of 4-mil

polyethylene sheeting, taped and glued in place.

- **2.27.4** Provide shoring, bracing, and support as required to maintain structural integrity of materials and systems. Provide protection for other portions of project and protection from the elements. Protect existing electrical and electronic systems, cabling, and other components during all phases of abatement.
- **2.27.5** Install additional polyethylene barriers as needed during and after removal, in order to protect surfaces.
- **2.27.6** Spray asbestos-containing wall panels with water, using spray equipment capable of providing a "mist" application to reduce the release of fibers. Wet the material without causing excessive dripping. Do not use water if it would cause a hazardous condition. Unbolt and remove wall panels intact with breakage kept to a minimum.
- **2.27.7** Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to areas acceptable to the Owner. If additional storage is necessary, obtain and pay for such storage off-site.
- **2.27.8** Material shall not be allowed to dry before loading into appropriate dumpsters with a lining of 6-mil polyethylene sheeting taped and glued in place. Ensure that all contaminated materials are wrapped with polyethylene sheeting to yield a minimum covering of 6-mils before removal from the site.
- 2.27.9 Maintain work areas free of accumulated asbestos-containing materials at all times.
- **2.27.10** Ensure all disposal containers are properly labeled in accordance with regulations. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities (including EPA regulations, AHERA, NESHAP, TDSHS and OSHA) which bear on performance of work and disposal of ACM.

2.28 ROOFING REMOVAL

- **2.28.1** Take all cautions necessary to ensure there is no asbestos contamination to those areas not included in work schedule. Should areas outside the work area become contaminated with asbestos-containing materials due to poor work practices, the Contractor shall immediately clean them utilizing wet cleaning and HEPA vacuum methods.
- **2.28.2** Establish a controlled work area at least five feet away from the edge of the material to be abated with barricade tape and appropriate signage.
- **2.28.3** Cover the ground, or other horizontal structure beneath the edge of the roof with one layer of six mil polyethylene sheeting. Cover the ground outward from the wall to a distance of at least six feet.
- **2.28.4** Remove roof flashing using wet methods. Remove the flashing from the wall to a distance of two feet onto roof field. Remove all roof flashing materials from parapet walls and tops of walls.
- **2.28.5** Place asbestos containing materials in six mil polyethylene wrap, or load into appropriate dumpsters with a lining of 6-mil polyethylene sheeting taped and glued in place.
- **2.28.6** Upon completion of removal, inspect the work area and adjacent areas for any ACM debris. Bag and dispose of properly. Clean area utilizing HEPA vacuums and wet methods.
- **2.28.7** Material shall not be allowed to dry before being wrapped in in 6-mil polyethylene sheeting or bags. Any contaminated material capable of puncturing the polyethylene bags shall be packaged separately.

- **2.28.8** Maintain work areas free of accumulated asbestos-containing materials at all times. Keep waste materials wet until sealed in polyethylene bags or sheeting. Clean area beneath work area utilizing HEPA vacuums and wet methods at end of each shift.
- **2.28.9** Seal polyethylene coverings air tight. Ensure that all contaminated materials are bagged to yield a minimum covering of 6-mils before removal from the work area.
- **2.28.10** Ensure all disposal containers are properly labeled in accordance with regulations. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities (including EPA regulations, AHERA, NESHAP, TDSHS and OSHA) which bear on performance of work and disposal of ACM.

2.29 CLEANING OF POTENTIALLY CONTAMINATED AREAS

- **2.29.1** Prior to commencing abatement work, shut down and isolate heating, cooling, and ventilating air systems to prevent contamination and fiber dispersal to other areas of the building. Seal vents within the work area with tape and 6-mil plastic sheeting.
- **2.29.2** Seal off all doorways to the work area with overlapping flaps consisting of 6-mil polyethylene sheeting sealed with tape. Install negative air units in the work area, exhausting to the outside. Provide sufficient number of negative air units in the work area to provide air movement throughout the work area then exhausting to the exterior.
- **2.29.3** Clean the work area first using HEPA vacuum equipment and then wet cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not use HEPA vacuum equipment on wet surfaces unless units are specially constructed for wet/dry use. Do not use amended water on gypsum board or other material which would be damaged by the wetting agent. HEPA vacuuming or damp sponge with regular water would be appropriate.

2.30 DISPOSAL OF ASBESTOS-CONTAINING WASTE (SOLID AND/OR LIQUID):

- **2.30.1** As the work progresses, to prevent exceeding available storage capacity on-site, workers from uncontaminated areas in full protective clothing and dual cartridge respirators shall enter the equipment decontamination unit and place the appropriate supply of specified containers within the holding room. Workers in the holding room shall be passed sealed, double-bagged material. Bags may be true 6-mil thickness, or have a tear resistance of M.D. 300 grams, T.D. 2,068 grams, and dart impact of 216 grams. Dispose of waste materials or store at approved location. Ensure all curtained doorways are closed. Ensure that all containers are labeled and sealed properly before removing for transport and disposal. The color of the disposable clothing worn outside the work area shall be a different color than the disposable clothing worn inside the work area. At no time shall a removal worker pass the curtained doorway between the holding room and the wash room. Drums will not be required if abatement contractor uses sealed bins or enclosed trucks to store and transport bagged waste.
- **2.30.2** The exterior bag or fiberboard drum shall have warning and generator's labels applied as specified in 40 CFR 61.150(a)(1)(iv)-(v).
- **2.30.3** Prepare and sign the Waste Shipment Record (WSR) for each load of asbestos-containing waste transported off site. Ensure that the WSR is completed by the transporter(s) and waste disposal site operator.
- **2.30.4** Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste in compliance with 40 CFR 61, Subpart M and during the transport of asbestos-containing waste in compliance with 49 CFR 171 and 172.
- 2.30.5 Vehicles used for transporting asbestos-containing materials to disposal sites shall have a

completely enclosed, lockable storage compartment if drum requirement is to be deleted. Storage compartments shall be plasticized and sealed with a minimum of one (1) layer of 6-mil polyethylene on the sides and top and two (2) layers of 6-mil polyethylene on the floor. The compartments shall be thoroughly wet cleaned and/or HEPA vacuumed following the disposal of each load of material at the dump site. At the conclusion of the project (or before transport vehicles are used for other purposes), the polyethylene shall be properly removed and disposed of as contaminated waste. After this is accomplished, compartments shall once again be wet cleaned and/or HEPA vacuumed in order to eliminate all debris prior to being returned to the rental company. All plastic sheeting, tape, cleaning material, including mops and sponges, clothing, filters, and all other contaminated disposable materials shall be packaged, labeled, and disposed of as asbestos-containing waste.

- **2.30.6** Dispose of materials at an authorized disposal site in accordance with the requirements of federal, state and local disposal authorities.
- **2.30.7** Workers unloading waste material at the disposal site shall be dressed in full-body protective clothing and dual cartridge respirators.

3.0 CLEANUP PROCEDURES AND CLEARANCE STANDARDS

3.1 GROSS CLEANUP:

- **3.1.1** Remove all visible accumulations of asbestos-containing materials and debris by HEPA vacuums, sponging, etc. Wet clean all surfaces within the work area.
- **3.1.2** The entire work area shall be totally, visibly clean. The abatement contractor shall notify the Consultant of the time the work area will be ready for visual inspection, at least twelve hours in advance of the inspection. This inspection shall be certified by the abatement contractor and will be verified by the Consultant using the "Certification of Visual Inspection".

3.2 ENCAPSULATION OF WORK AREAS:

- **3.2.1** The work area shall have passed visual inspection prior to post-removal encapsulation. Negative air must continue to run.
- **3.2.2** An approved encapsulant shall be applied, using airless spraying equipment, to all areas of the project where asbestos-containing materials have been removed, except where such application will inhibit adhesion of new finishes.

3.2.3 ENCAPSULANTS:

- 3.2.3.1 The encapsulant shall be compatible with the replacement material as per manufacturer advice.
- 3.2.3.2 If any encapsulant is incompatible with the substrate, the abatement contractor shall be fully responsible for providing an alternate encapsulant that is compatible, at no additional cost to the Owner.

3.3 FINAL CLEANUP:

- **3.3.1** After encapsulant has dried, carefully remove remaining wall and floor plastic, folding inward and sizing for proper disposal. Leave vent, window and door seals in place.
- **3.3.2** Using wet methods and HEPA vacuuming, clean the entire work area.
- **3.3.3** The entire work area shall be totally, visibly clean.
- **3.3.4** Contractor shall inform the Consultant that the area is ready for clearance testing.

3.4 FINAL CLEARANCE:

- **3.4.1** Clearance air monitoring samples shall be collected.
- **3.4.2** If air sampling results for Final Clearance are less than or equal to 0.01 f/cc by PCM analysis, the vent, door and other seals shall be removed and the areas behind them wet wiped and HEPA vacuumed.
- **3.4.3** Contractor shall remove decontamination unit, negative air equipment and any other materials associated with the abatement project.

3.5 **TESTING/AIR MONITORING:**

3.5.1 Throughout the preparation, removal, cleaning and final clearance operations, air monitoring shall be conducted by the Consultant retained by the Owner to monitor Contractor's compliance with these specifications, and any applicable state and local regulations.

- **3.5.2** The abatement contractor shall provide, at his own expense, monitoring of his employees as required by 29 CFR 1926.1101(f).
- **3.5.3 BASELINE MONITORING:** The Consultant will conduct area monitoring and establish the baseline ambient fiber concentrations prior to the pre-cleaning operations for each removal site. Three 1250 liter samples, minimum per site. PCM method will be utilized. Samples may be archived as stated in TDSHS Regulations Section 295.58.
- **3.5.4 MONITORING DURING ASBESTOS OPERATIONS:** The Consultant will conduct area monitoring inside the asbestos control area during the work shift. The consultant will conduct area monitoring outside the entrance to the asbestos control area and near the discharge of the local exhaust system. PCM method will be utilized in accordance with NIOSH 7400.

Areas to be Sampled	Number of Samples for each 8-hour shift - Typical	Sample Volume (Liters) Typical
Inside Work Area	1	480L
Outside work area but inside building (barriers, baselines)	1	1250L
Outside building near local exhaust	1	1250L
Reference exposure level	n/a	1250L
Quality Control	1	480L

- **3.5.5** <u>CLEARANCE MONITORING:</u> The Consultant will conduct a one phase aggressive air monitoring to establish the fiber concentration after completion of the visual inspection. Final air monitoring results shall be less than or equal to 0.01 f/cc by PCM analysis, and for quantities of 160 S.F. or 260 L.F. or more in schools, less than 70 Structures/square millimeter by TEM analysis.
- **3.5.6 <u>RE-TESTING:</u>** If the clearance level is not achieved by the results of the first round of testing, the abatement contractor shall reimburse the Owner for retesting the area until clearance is achieved. The cost for testing and clearance samples will be assessed against the abatement contractor's payments due on a Time and Materials basis.
- **3.5.7 MONITORING RESULTS:** PCM analysis will be completed and results reviewed by the Owner or the Consultant within 24 hours, within 12 hours for final compliance monitoring. The Consultant shall notify the abatement contractor and the Owner immediately if any fiber concentrations exceed acceptable limits. Analytical results are considered the Owner's property and use of these results for any purposes other than the final clearance will require the Owner's written approval.
- **3.5.8** Air monitoring for each glove bag and repair operation will be by personal sample collected on the worker to check for exposure level with reference to the baseline levels.

3.5.9 CERTIFICATION OF VISUAL INSPECTION:

The following Certification of Visual Inspection is a sample of the Form that shall be completed by the abatement contractor following the completion of the removal, cleanup and his visual inspection of the work area. The Consultant will provide a written list or a verbal explanation of deficient items if the certificate is rejected.

VISUAL INSPECTION CERTIFICATION

Facility/Building Address:	
Project Number:	
Area(s):	
CONTRACTOR'S CERTIFICATION	

The abatement contractor's representative certifies that he has inspected the work area and all asbestos materials identified in the project specifications have been removed.

Ву:		Date:	
	(signature)		
		Title:	
	(printed name)		
Company			

PROJECT MONITOR'S CERTIFICATION

The Consultant's representative named below is a licensed project manager authorized by the project consultant to conduct visual inspections at the site. He/she certifies that he has accompanied the Contractor on his inspection and verifies that to the best of his knowledge, the Contractor's certification is a true and honest one.

Clearance air testing has been completed and the analysis results comply with the specified clearance criteria. Air samples were analyzed by Phase Contrast Microscopy. Clearance air sample numbers are listed below:

By:		Date:
	(signature)	
		Title:
	(printed name)	

PCM Clearance criterion = each sample is less than or equal to 0.01 f/cc TEM Clearance criterion = average of samples is less than or equal to 70 S/mm²



Project Manager Authorization

For the project located at <u>1919 Runnels St., Houston, Texas 77003</u>

<u>Theophilus Ojie, Akinola Olufuwa</u> is an EPA accredited and TDSHS licensed Project Manager who has met all the requirements of the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and Texas Department of State Health Services (TDSHS), and is therefore capable and authorized to perform inspections and clearance testing for asbestos abatement work areas.

FERN Environmental, LLC TDSHS Asbestos Consulting Agency (10-0455)

tM

Greg Lall TDSHS Licensed Consultant #10-5216



Clayton Homes Apts., 1919 Runnels, Houston, TX 77003





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Exhibit F Site Drawings

NOTES:

- 1. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. ALL KNOWN EASEMENTS AND ENCROACHMENTS ARE SHOWN HEREON.
- 2. ALL UNDERGROUND UTILITIES SHOWN ARE NOT GUARANTEED TO BE COMPLETE OR DEFINITE, BUT WERE OBTAINED FROM THE BEST INFORMATION AVAILABLE.
- 3. UTILITY INFORMATION SHOWN WAS BASED ON INFORMATION OBTAINED FROM THE CITY OF HOUSTON RECORDS, DRAWINGS FURNISHED BY THE UTILITY COMPANIES AND DRAWINGS AS FURNISHED BY THE HOUSING AUTHORITY OF THE CITY OF HOUSTON WITH FIELD TIES TO EXISTING PHYSICAL FEATURES.
- 4. DUE TO LACK OF DOCUMENTATION OF CONSTRUCTION REVISIONS, ABANDON-MENTS, OR REPAIRS TO EXISTING UTILITIES, CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL UTILITY LINES PRIOR TO CONSTRUCTION.
- 5. ALL PROPERTY CORNERS TO BE 5/8 INCH IRON RODS UNLESS OTHERWISE NOTED.
- 6. ALL BUILDINGS ARE TWO STORY BRICK AND WOOD UNLESS NOTED. OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY
- OR COMPLETENESS OF ANY INFORMATION AS NOTED ABOVE.
- CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL INFORMATION AND DATA, FOR LOCATING ALL UNDERGROUND FACILITIES WHETHER OR NOT SHOWN OR INDICATED AND FOR REPAIRING ANY DAMAGE OR EXTRA WORK RESULTING FROM SAID PERFORMANCE.

THIS IS TO CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND, THAT THIS PLAT CORRECTLY REPRESENTS THE FACTS FOUND AT THE TIME OF THIS SURVEY, THAT THERE ARE NO IMPROVEMENTS, ENCROACHMENTS OR VISIBLE EASEMENTS EXCEPT AS SHOWN HEREON, AND THAT THIS SURVEY CONFORMS TO THE CURRENT TEXAS SURVEYORS ASSOCIATION STANDARDS AND SPECIFICATIONS FOR A CATEGORY IA, CONDITION II SURVEY.



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- 7. OWNER AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY INFORMATION AS NOTED ABOVE.
- 8. CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL INFORMATION AND DATA, FOR LOCATING ALL UNDERGROUND FACILITIES WHETHER OR NOT SHOWN OR INDICATED AND FOR REPAIRING ANY DAMAGE OR EXTRA WORK RESULTING FROM SAID PERFORMANCE.

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SURVEY

5629 Schumacher • Houston, Texas 77057

SCALE: | " = 30"

DATE : 95930, 1985

30' 20' 10' 0

- any remaining Gyp. Bd., nails, or other items
- Hall #2, & Bedroom #2, Closet, & Bath Room. (Total Unit)
- prepare for re-painting.
- as required by Plumbing Drawings.
- to remain. (Total Unit)
- Specifications, where scheduled.

- cabinet, towel bar, shower curtain rod, & tollet paper dispenser.

- Transition into existing roofing a minimum of 24" beyond repaired area.
- new window & trim.
- Building Front Elevation.
- on Building Front Elevation.
- unit as shown on Building Front Elevation. Match existing.

- hardware. Per schedule.
- at hall side only.







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