



CROSSROADS
ENVIRONMENTAL, LLC

INSPECTIONS • PROJECT DESIGN • PROJECT MANAGEMENT • AIR MONITORING

SPECIFICATIONS FOR ASBESTOS ABATEMENT

SITE:

**NEW MCCrackEN MIDDLE SCHOOL
500 DUPRE DRIVE
SPARTANBURG, SC 29307**

Project Design Number: PD19-0670-17010

May 22, 2019

Prepared for:

**Spartanburg School District Seven
610 Dupre Drive
Spartanburg, SC 29307**

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PD#: PD-00149, Exp. 11/28/2019

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ATTACHMENT I: Overall and HVAC Demo Plans

ATTACHMENT II: Bid Form for Abatement

**SPECIFICATIONS FOR ASBESTOS ABATEMENT
NEW MCCRACKEN MIDDLE SCHOOL
500 DUPRE DRIVE, SPARTANBURG, SC 29307
PROJECT DESIGN #: PD19-0670-17010**

I. PREFACE/GENERAL DESCRIPTION

Air Monitoring and Project Management shall be performed by a qualified and licensed environmental firm that has been hired by the Building Owner. The Building Owner or other representatives of the Building Owner shall not be held liable in any way for negligence, whereas it be intentional or unintentional on the part of the Contractor.

As part of the construction project to turn the existing Spartanburg High School into the new McCracken Middle School, significant renovations and the installation of new mechanical, electrical and plumbing equipment will occur in the 'D-Wing', Boiler Room, Chiller Room and assorted mechanical rooms/penthouses throughout the facility. To facilitate these renovations, asbestos abatement of existing building materials will need to occur prior to construction trades. The D-Wing features asbestos-containing (ACM) drywall joint compound and vinyl floor tile/mastic throughout the central section of the second and third floors. Additionally, HVAC duct work with ACM sealant will be impacted by new HVAC equipment installation.

The Boiler Room and mechanical penthouse of D-Wing will be stripped of all asbestos-containing (ACM) insulating materials, gaskets, etc. There are limited mechanical closets throughout the school that feature limited ACM fitting insulation and/or ACM coating. In the Cafeteria air handler closet and adjacent east hallway, asbestos-containing ceiling texture will be abated entirely. The Chiller Room features an ACM insulated tank in the far, right corner.

II. SCOPE OF WORK

The scope of work will include abatement of all asbestos-containing materials in the Boiler Room, Chiller Room, D-wing penthouse and specified mechanical closets/penthouses, and the abatement of asbestos-containing ceiling texture in the Cafeteria air handler closet and adjacent east hallway.

MATERIAL	APPROXIMATE QUANTITY	LOCATION(S)
Drywall Joint Compound	14,500 sq. ft. (Accounts for multiple layers)	Located in 201D.1, 204D.1, 204D.2, 205D.1, perimeter walls of central section on D-Wing 2nd floor, 308D, 304D.1, 304D.2, perimeter walls of central section on D-Wing 3rd Floor. Please Note: This quantity does not include 1" green wallboard with metal brackets in chases and void spaces within central sections of D-Wing 2nd and 3rd floors. Please Note: This quantity is based off of a 10' finished height for drywall, as the walls are unfinished above this point. Floor to decking height is 14.5'.
12" x 12" Brown Vinyl Floor Tile & Black Mastic	1,350 sq. ft.	Located in 308D, 304D.1, 304D.2, 201D.1, 204D.1 & 204D.2.
Red/Brown HVAC Duct Mastic & Duct Union Gasket Material on Galvanized Box Duct	100 ln. ft.	Located throughout all floors of D-Wing; select demo of existing HVAC duct will occur. See M010, M020 & M030.
Black Mastic Over Fiberglass on Elbows/Fittings	100 ln. ft.	Located on limited fiberglass elbows throughout D-Wing above drop ceiling grid.
Tank Insulation	100 sq. ft.	Located on suspended tank in back, right corner of Chiller Room.
Rope Gasket	19 ln. ft.	Located on the Kewanee Classic III Boiler doors in Boiler Room.
Canvas Tabs	1 sq. ft.	Located on the Kewanee Classic III Boiler doors in Boiler Room.
Hard Joint/Fitting Insulation	60 Fittings	Located on east wall of Boiler Room. Please Note: Quantity does not include roof drains due to inaccessibility.
Pipe Run Insulation	554 ln. ft.	Located on east wall of the Boiler Room.
Hard Joint/Fitting Insulation	80 Fittings	Located on the south wall (steam header) of the Boiler Room. Please Note: Quantity does not include roof drains due to inaccessibility.
Pipe Run Insulation	355 ln. ft.	Located on the south wall (steam header) of the Boiler Room.
Exterior Insulation & Canvas	600 sq. ft.	Located on the Kewanee Firebox in the Boiler Room.
Perimeter Sealant/ Crack Filler	60 ln. ft.	Located in the gaps at the base of the Kewanee Firebox in the Boiler Room.

MATERIAL	APPROXIMATE QUANTITY	LOCATION(S)
Hard Joint/ Fitting Insulation	106 Fitting	Located throughout the D-Wing penthouse.
Silver Duct Sealant	60 In. ft.	Located at duct work seams throughout D-Wing penthouse.
Hard Joint/ Fitting Insulation	24 Fittings	Located in the A-Wing, B-Wing and C-Wing mechanical closets under stairwells; Equipment Room G (AHU2) off Cafeteria; Faculty Café Equipment Room (AHU3).
AHU Interior Mastic Coating	180 sq. ft.	Located inside the air handlers of Equipment Room G (AHU2) off Cafeteria and Faculty Café Equipment Room (AHU3).
Ceiling Texture	168 sq. ft.	Located on ceiling of Equipment Room G (AHU2) off Cafeteria.
AHU Flex Material (White)	34 In. ft.	Located on the air handlers of Equipment Room G (AHU2) off Cafeteria and Faculty Café Equipment Room (AHU3).
Ceiling Texture	990 sq. ft.	Located on ceiling of hallway adjacent to east Cafeteria storefront.

Time allotted for base bid abatement: Forty (40) working days during regular 40-hour work weeks.

Start Date: Ten (10) working days following Notice to Proceed.

III. CONTRACTOR INFORMATION

A. SUBMITTALS

Project documentation including insurance certificate (see insurance requirements), SC-DHEC Asbestos Abatement Contractor's License, personnel accreditations, and waste shipment records must be submitted to the Building Owner's Representative. The contractor and personnel accreditations must be submitted prior to project start up; waste shipment records to the Building Owner within 30 days after completion of the project.

B. NOTIFICATIONS/LICENSES

The Contractor is responsible for notification to SC-DHEC and for paying all applicable fees.

Contractor is responsible for obtaining a City Business license, where applicable.

C. OSHA

It is the abatement contractor's responsibility to fulfill all Occupational Safety and Health Administration (OSHA) requirements under CFR 1926.1101 and all other safety requirements that may be required by the work site.

D. PERSONNEL

GENERAL SUPERINTENDENT/SUPERVISOR:

Provide a General Superintendent licensed in Asbestos work that is experienced in administration, environmental remediation, general contracting coordinating, including work practices, protective measures for building and personnel, disposal procedures, etc. This person is responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos-containing materials as outlined in OSHA 29 CFR 1926.1101, and 1926.20 through 1926.32. The Superintendent needs to be knowledgeable of the South Carolina Department of Health and Environmental Control Asbestos Regulation 61 61-86.1: Standards of Performance for Asbestos Projects, Effective May 27, 2011 and EPA NESHAP 61.140 Subpart M-National Emission Standard for Asbestos.

Experience and Training: The General Superintendent must be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as a SCDHEC Asbestos Supervisor.

The General Superintendent must be on site at all times, and must be able to communicate in the language of Regulatory Personnel.

ASBESTOS SUPERVISOR(S):

Provide full time Supervisor(s) for inside the asbestos work area with experience in asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. One inside supervisor must be able to communicate in the language of the workers and be able to communicate in English to the Building Owner's Representative(s) and/or state regulatory personnel. All inside supervisor(s) are responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos-

containing materials as outlined in OSHA 29 CFR 1926.1101, and including 1926.20 through 1926.32. The Supervisor(s) need to be knowledgeable of the South Carolina Department of Health and Environmental Control Asbestos Regulation 61 61-86.1: Standards of Performance for Asbestos Projects, Effective May 27, 2011 and EPA NESHAP 61.140 Subpart M- National Emission Standard for Asbestos.

Experience and Training: The Asbestos Supervisor(s) (competent person) must be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as SCDHEC Supervisors.

NON-SUPERVISORY PERSONNEL:

Provide an adequate number of qualified personnel to meet the schedule requirements of the project.

Experience and Training: All workers employed for abatement throughout the project shall be accredited as an Asbestos Abatement Worker in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C (ASHARA) and be licensed as SCDHEC Asbestos Workers.

EVERY ASBESTOS ABATEMENT ENTITY PERFORMING WORK MUST HAVE HIS/HER ORIGINAL LICENSE, AS WELL AS A COPY OF HIS/HER MOST CURRENT TRAINING CERTIFICATE ON SITE AT ALL TIMES. HAVING THE LICENSE/CERTIFICATE IN A VEHICLE IS NOT ACCEPTABLE.

E. BUILDING OWNER AND OWNER'S REPRESENTATIVES

1. **BUILDING OWNER:**
Spartanburg School District Seven
610 Dupre Drive
Spartanburg, SC 29307
Procurement Contact: Ms. Pamela Phillips
(864) 594-6179
pPhillips@spart7.org
Facilities Contact: Mr. Terry Gilmer
(864) 809-4678
tgilmer@spart7.org

2. **FACILITY:**
New McCracken Middle School
500 Dupre Drive
Spartanburg, SC 29307
3. **DESIGN FIRM & PROJECT MANAGER:**
Crossroads Environmental, LLC
1258 Boiling Springs Road
Spartanburg, SC 29303
Point of Contact: Evans Harris
Phone: (864) 541-8736
E-mail: eharris@crossroadsenv.net

F. BIDDING INFORMATION

A mandatory pre-bid meeting will be held at the Spartanburg High School/
New McCracken Middle School on **June 7, 2019 at 10:00 a.m.**

Questions are due to eharris@crossroadsenv.net by June 12, 2019 at 2:00
p.m.

Sealed bids only are due by June 18, 2019 at 2:00 p.m. to the following
address:

Spartanburg School District Seven
Attn: Pamela Phillips
610 Dupre Drive
Spartanburg, SC 29307

G. BID SECURITY

Each proposal shall be accompanied by a bid guarantee of 5 percent of the bid. Bid guarantee may be a certified check insured by the Federal Deposit Insurance Corporation or 5 percent bid bond of the proposal executed by such a surety company licensed under the laws of South Carolina to execute such bonds, conditioned that the surety will upon demand forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract in accordance with the bid bond. The Owner shall retain said deposit as liquidated damages in the event of failure of the successful bidder to execute the contract and provide the required surety (Performance Bond/Labor and Material Payment Bond described below) within ten (10) working days after notice of the award.

H. PERFORMANCE BOND/LABOR AND MATERIAL PAYMENT BOND

Prior to signing the contract, the Contractor shall secure and post a Performance Bond/Labor and Material Payment Bond for the amount equal to 100% of the Contract Sum. The costs of such bonds shall be included in the proposed contract sum.

I. LIQUIDATED DAMAGES

Liquidated damages in the amount of \$100.00 will be incurred per calendar day that exceeds the completion date. The project is considered complete when all work outlined in Section II. Scope of Work, has been performed.

J. INSURANCE REQUIREMENTS

1. The contractor who is awarded the contract must provide a copy of his Certificate of Insurance. Insurance coverage shall include **General Liability, Automobile Liability, Asbestos Pollution Liability, and Worker's Compensation with no less coverage than \$1 Million (\$1,000,000) for each category. The policy shall state that Sunset Clause or similar clause or clauses of intent are not included in the coverage.**
2. **Asbestos Pollution Liability Insurance is required.** A completed Certificate of Insurance for Asbestos Pollution Liability Insurance must be submitted **naming the Building Owner, the Owner's Managing Agent and the facility as an additional named insured. This can be submitted upon award of the contract.**
3. Contractor shall provide "occurrence" insurance from exposure to asbestos. An "A+" rated insurance carrier shall be provided. If the insurer has less than an "A+" rating, the Contractor shall obtain approval for the insurance carrier from the Building Owners prior to commencement of the project.
4. The Contractor shall purchase and maintain in a company or companies acceptable to the Owner such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable:

- (a) Claims under workers' compensation, disability benefits and other similar employee benefit acts;
 - (b) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
 - (c) Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
 - (d) Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or by any other person;
 - (e) Claims for damages other than to the work itself because of injury to or destruction of tangible property, including loss of use resulting there from; and
 - (f) Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
5. The insurance shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater.
- (a) Minimum limits of liability for the following types of insurance are required as follows:

All Limits in Thousands

- | | | |
|----|---|---------|
| 1. | Comprehensive General Liability, including: | |
| | a. General Aggregate | \$1,000 |
| | b. Products-Comp/Ops Aggregate | \$1,000 |
| | c. Personal & Advertising Injury | \$1,000 |
| | d. Fire Damage | \$50 |
| | e. Medical Expense (Any one person) | \$5 |
| 2. | Worker's Compensation, including: | |
| | a. Worker's Compensation Insurance | \$1,000 |
| | b. Employer's Liability | \$1,000 |

3. Comprehensive Automobile Liability,
4. Combined single limit, including:
 - a. All owned Automobiles \$1,000
 - b. Non-owned Automobiles \$1,000
 - c. Hired Car Coverage \$1,000
- (b) In addition to Contractual Liability including indemnification provision Bodily Injury and Property Damage coverage under both Comprehensive General and Comprehensive Automobile forms shall include 'occurrence' basis working, which means an event, or continuous or repeated exposure to conditions which unexpectedly causes injury or damage during policy period.
- (c) Contractor shall either (1) require each of his Subcontractors to procure and maintain during the life of his subcontract, Subcontractors Comprehensive General Liability, Automobile Liability and Property Liability Insurance of the type and in the same amounts as specified in above, or (2) insure the activities of his Subcontractors in his own policy.
6. The insurance shall include contractual liability insurance applicable to the Contractor's obligations under indemnification provision.
 - (a) To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligations shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph.

- (b) Certificate of Insurance must be filed by an insurer authorized to do business in South Carolina by the South Carolina State Insurance Commission. All blanks and questions on the Certificate must be filled out completely. Incomplete or inadequate Certificate will be returned to the Contractor as unsatisfactory and commencement of his work will be delayed until satisfactory Certificate is submitted. Such delay will not warrant extension of contract time.

K. POWER & WATER

Power and water will be provided by the Building Owner. The Contractor will be responsible for hoses, connectors, power chords, etc.

L. SANITARY FACILITIES:

The Building Owner will provide access to designated restrooms; however, the Contractor should restrict movement outside of the work areas to restroom use only, and will be responsible for cleaning the designated restrooms.

M. SUMMARY OF TASKS:

Contractor shall remove and dispose of all asbestos-containing materials to be impacted by renovations and equipment installation as indicated in the specifications for **New McCracken Middle School**.

Contract work includes:

1. Pre-abatement activities including pre-construction meeting, inspection, notifications, permits, submittal approvals, preparations, emergency arrangements, and submittal of plan of action.
2. Abatement activities including preparation of work site, removal and disposal of asbestos containing and/or contaminated waste, recordkeeping, security of job site, pre-work and post-work inspections, and OSHA compliance air monitoring.
3. Cleaning, Decontaminating, and Clearance activities including final inspection, clearance testing, certification of decontamination, and all post work submittals.
4. Any equipment that is unable to be moved must be polyed and protected during abatement.

N. STOP WORK:

If the Building Owner or Owner's Representative verbally issues a stop work order, the abatement contractor shall immediately and automatically stop all work and initiate fiber reduction activities. Do not resume asbestos removal until authorized by the Building Owner or the Owner's Representative. Do not recommence work until authorized by the Building Owner or the Owner's Representative. Standby time and cost required for corrective action will be at the contractor's expense. The occurrence of the following events shall be reported in writing to the Owner's Representative and shall require the contractor to immediately stop asbestos removal and initiate fiber reduction and other appropriate activities:

1. Excessive airborne fibers outside the containment area (>0.01 f/cc or established background levels, whichever is greater).
2. Break in either the primary or critical containment barriers.
3. Serious injury to a worker within the containment area that necessitates interruption of the normal decontamination procedures.
4. Presence of a fire and/or safety emergency.
5. Respiratory Protection System failure.
6. Power failure

IV. PERSONAL PROTECTIVE EQUIPMENT

The following work practices must be employed during the abatement of the above materials accordingly:

A. WORKER PROTECTION:

Before beginning work of this section provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

Protective Clothing:

Coveralls: Provide disposable full-body coveralls with head covers, and require that they be worn by all workers in the Work/Isolation Area. Provide a sufficient number for all required changes, for all workers in the Work/Isolation Area.

Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers.

Do not allow boots to be removed from the Work/Isolation Area for any reason, after being contaminated with asbestos-containing material. Thoroughly clean, decontaminate and bag boots before removing them from Work/Isolation Area at the end of the work.

Hard Hats: Provide head protection (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner's Representative, Project Administrator, and Owner. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats with plastic strap type suspension. If hats are utilized in the Work/Isolation Area, thoroughly clean, decontaminate and bag hats before removing them from Work/Isolation Area at the end of the work.

Goggles: Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work/Isolation Area at the end of work.

B. RESPIRATORY PROTECTION:

Description of Work:

Instruct and train each worker involved in asbestos abatement or maintenance and repair of Class I, II, and III asbestos-containing materials in proper respiratory use. Require that each worker always wear a respirator, properly fitted on the face in the Work/Isolation Area from the start of any operation which may cause airborne asbestos fibers until the Work/Isolation Area is completely decontaminated. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

Respiratory Protection Program: Comply with ANSI Z88.2 - 1992 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.134 and CFR 1926.1101. Require that respiratory protection be used at all times where there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental. Require that a respirator be worn by anyone in a Work/Isolation Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until a negative exposure assessment has been completed.

General: The employer shall provide respirators, and ensure that they are used where required. Respirators shall be used in the following circumstances:

- During all Class I asbestos jobs.
- During all Class II work where the ACM is not removed in a substantially intact state.
- During all Class II and III asbestos jobs where the employer does not produce a "negative exposure assessment".
- During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed.
- During all Class IV work performed within the regulated areas where employees performing other work are required to wear respirators.
- During all work where employees are exposed above the TWA (0.1 f/cc) or excursion limit (1.0 f/cc).

V. PREPARATION OF THE REGULATED WORK AREA(S)

A. REGULATED AREA DEMARCATION:

The Regulated area is the location where environmental remediation work occurs. All class I, II, and III asbestos work as defined in OSHA CFR 1926.1101 (b) shall be conducted within regulated areas.

All work areas where asbestos work or other contaminants are being removed must be demarcated with barrier tape and signs.

Access to the regulated area shall be limited to persons authorized in accordance with OSHA and SC-DHEC.

Prohibited activities within the regulated area include, but are not limited to: no eating, drinking, smoking, chewing of tobacco and gum, or applying of cosmetics. The competent person shall ensure that all asbestos work performed within regulated area is supervised by a competent person, which is defined in South Carolina as a licensed Supervisor.

WORK/ISOLATION AREA:

The Work/Isolation area that is located within the regulated area is a variable of the extent of work of the Contract. It may be a portion of a room, a single room, or a complex of rooms. A "Work/Isolation Area" is considered contaminated during the work, and must be separated from the balance of the building, and decontaminated at the completion of the asbestos-control work.

Completely separate the Work/Isolation Area from other parts of the building to prevent asbestos-containing dust or debris from passing beyond the work/isolated area. Should the area beyond the Work/Isolation Area(s) become contaminated with asbestos-containing dust or debris because of the work, clean those areas in accordance with the specifications. Perform all such required cleaning or decontamination at no additional cost to owner.

Place all tools, scaffolding, staging, etc. necessary for the work in the area to be separated prior to completion of Work/Isolation Area separation.

CONTROL ACCESS:

Provide Warning Signs at each access to the Regulated Area on doors and/or critical barriers. Post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by OSHA 29 CFR 1926.1101:

LEGEND:

**DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND PROTECTION CLOTHING IN THIS AREA**

Provide spacing between respective lines at least equal to the height of the respective upper line.

B. CRITICAL BARRIERS:

Individually seal each opening between the work area and uncontaminated areas including windows, doorways, elevator openings, corridor entrances, drains, ducts, electrical outlets, grilles, grates, diffusers, and skylights with duct tape and a minimum of two (2) independent layers of polyethylene sheeting at least 6 millimeters (mil) in thickness taped securely in place. Seal all stationary equipment with a minimum of one (1) layer of polyethylene sheeting at least 4 mil in thickness. Maintain all seals until all work, including Project Decontamination, is complete and passing clearance results have been obtained.

C. PRIMARY BARRIERS:

The Primary Barriers must be installed in addition to Critical Barriers as specified in the preceding paragraphs. This is to protect the building and other surfaces in the Work/Isolation Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below.

For each work area in which friable removal will take place:

Cover all walls not being abated with a minimum of one (1) layer of clear polyethylene sheeting, each at least 4 mil in thickness, extending beyond wall/floor joints at least 6 inches (however, do not cover floor tile to be abated), mechanically supported and sealed with duct tape or spray-adhesive in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints.

Cover all ceilings not being abated with one (1) layer of clear polyethylene sheeting, each at least 4 mil in thickness, extending beyond wall/ceiling joints at least 12 inches, mechanically supported and sealed with tape in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints.

Cover all floors not being abated with a minimum of two (2) layers of clear polyethylene sheeting, each at least 6 mil in thickness, extending beyond wall/floor and wall/wall joints at least 12 inches, mechanically supported and sealed with duct tape or spray-glue in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints.

Install a viewing port in each containment measuring at least 24 inches by 24 inches in an external wall to allow unobstructed observation of abatement activities in the work area.

PRESSURE READINGS MUST BE RECORDED A MINIMUM OF FOUR TIMES PER 8-HR. SHIFT BY THE ON-SITE AIR MONITOR.

D. DECONTAMINATION UNIT:

Provide attached Personnel Decontamination facility for containment areas. Construct the decontamination facility in compliance with OSHA 29 CFR 1926.1101 and SC-DHEC Regulations. This requires that the decontamination enclosure (decon) include a clean room, airlock, shower with controllable hot and cold water, airlock, and equipment room. In addition, the Contractor must provide an adequate changing area that allows privacy when dressing out and a proper storage space for street clothes. Steps required to exit the work area through the decon are as follow:

- 1) Remove gross contamination and debris from protective clothing before entering the equipment room
- 2) Enter equipment room and remove and dispose of suit
- 3) Enter shower with respirator on, pass filters into equipment room for disposal
- 4) After showering, enter clean room to put on street clothes

The decontamination chambers must remain free of debris and standing water.

The Contractor must ensure that all contaminated water is filtered through a five-micron or smaller filter and discharged to a sanitary sewer system. No water (contaminated or filtered) shall be allowed to lead or drain outside of the work area.

E. LOAD-OUT:

Provide decontamination area for removal of bagged waste from work area. Where feasible, this load-out area should be separate from the personnel decon.

F. TEMPORARY LIGHTING FOR FULL CONTAINMENT:

Disconnect all existing power to lighting circuits in Work Area as described in Temporary Enclosures. All lighting to the Work Area and Decontamination facilities is to be provided from temporary electrical panel(s).

Provide the following or equivalent light level: One 100-watt incandescent lamp per 1,000 square feet of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 25 feet. In stairways, scaffold level, and at ladder runs, provide one lamp minimum per landing, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere.

- Provide lighting in areas where work is being performed to supply a 100-watt minimum light level in all areas of the work area.
- Provide lighting in any area being subjected to a visual inspection to supply a 100-watt minimum light level in all areas of the work area.
- Provide lighting in the Decontamination Unit supplying a 75-watt minimum light level.
- Provide sufficient lighting circuits as required by the work. All lighting circuits are to originate at temporary electrical panel.

G. HEPA FILTERED FAN UNITS:

Use units in the work areas that meet the following requirements.

Cabinets are to be constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches to fit through standard-size doorways. Provide units whose cabinets are:

- * Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance.
- * Arranged to provide access to and replacement of all air filters from intake end.
- * Mounted on casters or wheels.
- * Rate capacity of fan according to usable air movement capacity under actual operating conditions.

- * Clean and operates with sufficient number of pre and secondary filters to be changed out throughout the day.

Provide an operational air circulation system supplying a minimum of the following air circulation rate: 4 air changes per hour to achieve required air circulation according to the following procedure:

Air Circulation Required in Cubic Feet of Air per Minute (CFM) =

$$\frac{\text{Volume of Work/isolation Area (cu. ft.)}}{60 \text{ (minutes per hour)}} \times \frac{\text{Number of air changes per hour}}{60 \text{ (minutes per hour)}}$$

CFM/Capacity of unit= Number of units required

Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics or 50% of the manufacturer's rated capacity for the unit. The capacity of the combined units shall at least be capable of maintaining a negative pressure differential of -0.02 inches of water around the entire perimeter of the Work/isolation Area.

Provide a minimum of 2 additional units per containment as back-ups.

Contractor is responsible for calculating the correct number of units per containment and for providing enough units during the removal process to ensure negative pressure.

ALL UNITS SHOULD HAVE NEW HEPA FILTERS INSTALLED PRIOR TO PLACEMENT ON PROJECT SITE. IF A UNIT IS FOUND TO CONTAIN A DIRTY UNIT, THE CONTRACTOR WILL BE REQUIRED TO HAVE NEW HEPA FILTERS INSTALLED IMMEDIATELY OR HAVE THE UNIT WITH THE DIRTY FILTER REMOVED FROM THE JOBSITE.

H. MANOMETER:

A manometer must be utilized to measure the relative pressure. The inlet sensor of the manometer shall be located at the farthest point from any source of make-up air. The manometer must be calibrated by the Supervisor prior to the start of each work shift. The manometer record of daily readings must be recorded four times per eight-hour shift by the Licensed Air Monitor.

I. **EQUIPMENT:**

The Contractor must ensure that all necessary equipment to perform the job efficiently is provided. This includes attachments for HEPA vacuums.

VI. **REMOVAL PROCEDURES**

- **WET REMOVAL PROCEDURES DURING FRIABLE REMOVAL OF ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND WITHIN THE NEGATIVE PRESSURE ENCLOSURE:**

The negative pressure enclosure shall consist of critical barriers, a minimum of one layer of 4-mil polyethylene sheeting on the walls and ceilings, a minimum of two layers of 6 mil polyethylene sheeting on the floors (only in areas where there is no floor tile to be abated), negative pressure differential machines, and a decontamination unit. Once the negative pressure enclosure has been constructed, lightly mist with a fine spray (mist) of amended water. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. Saturate material through to the substrate sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water to penetrate material thoroughly. Spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions.

Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.

As the material is removed, pack material while still wet into labeled 6-mil disposal bags. Do not allow material to dry out. Evacuate air from disposal bags with a HEPA filtered vacuum cleaner before sealing. Use the "gooseneck" procedure to seal bags by twisting the neck of the bags, sealing with duct tape, bending the neck of the bag over, and sealing again with a minimum three wraps of duct tape. Clean outside of bag and move to Wash Down Station adjacent to Equipment Decontamination Unit.

- **WET REMOVAL PROCEDURES DURING FRIABLE REMOVAL OF ASBESTOS-CONTAINING CEILING TEXTURE WITHIN THE NEGATIVE PRESSURE ENCLOSURE:**

The negative pressure enclosure shall consist of critical barriers, a minimum of one layer of 4-mil polyethylene sheeting on the walls and ceilings, a minimum of two layers of 6 mil polyethylene sheeting on the floors (only in areas where there is no floor tile to be abated), negative pressure differential machines, and a decontamination unit. Once the negative pressure enclosure has been constructed, lightly mist ceiling texture material with a fine spray (mist) of amended water. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water to penetrate material thoroughly. Manually scrape material down to plaster/cementitious ceiling substrate. Spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions.

Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.

As the material is removed, pack material while still wet into labeled 6-mil disposal bags. Do not allow material to dry out. Evacuate air from disposal bags with a HEPA filtered vacuum cleaner before sealing. Use the "gooseneck" procedure to seal bags by twisting the neck of the bags, sealing with duct tape, bending the neck of the bag over, and sealing again with a minimum three wraps of duct tape. Clean outside of bag and move to Wash Down Station adjacent to Equipment Decontamination Unit.

Following a satisfactory visual, spray remaining ceiling substrate with a lockdown encapsulant, prior to final air clearance testing.

- **REMOVAL OF THERMAL SYSTEM INSULATION (GLOVEBAG METHOD):**

Use glovebag procedures in compliance with federal and state regulations for the removal of small sections of TSI. Place a Primary Barrier of at least one layer of 6 mil polyethylene as a drop cloth below material to be removed extending at least 10 feet in all directions. Provide, at a minimum, 6 mil polyethylene, polyvinylchloride or equivalent plastic sack with two inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for wand or HEPA vacuum wand, and sufficient capacity to hold removed materials and permit sealing as specified. Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure. Check pipe where the work will be performed. Wrap damaged (broken lagging, hanging, etc.), pipe in 6 mil plastic and "candy-stripe" with duct tape. Place one layer of duct tape around undamaged pipe at each end where the glove bag will be attached. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter). Place necessary tools into pouch located inside glovebag. This will usually include at least the following items: bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-wetted cloth. Place one strip of duct tape along the edge of the open top slit of glove bag for reinforcement. Place the glove bag around section of pipe to be worked on and staple top together through reinforcing duct tape. Next, duct tape the ends of glove bag to pipe itself, where previously covered with plastic or duct tape. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and re-test. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage. Thoroughly wet material to be worked on with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate. One person places his hands into the long-sleeved gloves while the second person directs garden sprayer at the work. Use bone saw, if required, to cut insulation at each end of the section to be removed. A bone saw is a serrated heavy gauge wire with

ring-type handles at each end. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum. Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping. Rinse all tools with water inside the bag and place back into pouch. Using scrub brush, rags and water, scrub and wipe down the exposed pipe. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag. Remove the vacuum nozzle, twist water sleeve closed and seal with duct tape. From outside the bag, pull the tool pouch away from the bag. Place duct tape over twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. Contaminated tools may then be placed directly into next glove bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste. With removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glove bag from the pipe. Slip a 6 mil disposal bag over the glove bag (still attached to the pipe). Remove tape or cut bag, open the top of the glove bag, and fold it down into disposal bag. Clean all surfaces in the Work Area using disposable cloths wetted with water with surfactant or removal encapsulant added. When the surfaces have dried, clean them with a HEPA filtered vacuum. Seal exposed ends of remaining pipe insulation and exposed pipe. Collapse the bag with a HEPA vacuum twist top of bag, seal with at least 3 wraps of duct tape, bend over, and seal again with at least 3 wraps of duct tape.

Dispose of all rags, plastic sheet, etc. in accordance with requirements "Disposal of Procedures".

Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work of this section.

- **FRIABLE ABATEMENT OF VINYL FLOOR TILE & MASTIC WITHIN THE NEGATIVE PRESSURE ENCLOSURE:**

Remove binding strips or other restrictive molding from doorways, walls, etc. Dispose of any materials that have glue or floor mastic on them as asbestos-containing waste. Wet the floors with amended water so that entire surface is wet. Do not allow to puddle or run off to

other areas. Keep floor continuously wet throughout removal operation. Bag and dispose of carpet strips as ACM. Remove tiles using a manual or powered spade, or stripping machine. Continuously mist floor in area where removal is being performed with amended water. Wet any asbestos contaminated debris generated as necessary to keep continuously wet. Keep floor where tile has been removed continuously wet until after completion of heavy adhesive residue removal. Shovel broken tiles and asbestos contaminated debris into a disposal bag. Place bagged waste in a second disposal bag during decontamination and dispose of waste as required.

Remove adhesive residue by using adhesive removal solvents. Provide a slow-drying solvent intended to remove tile adhesive. Provide material that is not flammable, does not create combustible vapors and has no significant inhalation hazard. Provide materials that have no volatile organic solvents (VOCs) unless previously approved in writing by the Building Owner's Representative. Use solvents in accordance with manufacturers' instructions. Saturate adhesive with removal solvent and allow adhesive to soften. Remove by scraping, wet sanding, or wet scrub with floor cleaning machine with abrasive pad. Provide worker protection as required by material safety data sheet (MSDS) for any material used. Mop floor with removal solvent as required by manufacturer's directions as required to completely remove all residue of adhesive.

- **REMOVAL OF ASBESTOS-CONTAINING PIPE INSULATION WITHIN THE NEGATIVE PRESSURE ENCLOSURE:**

Once the negative pressure enclosure has been constructed, lightly mist to the satisfaction of Owner's Representative and/or the Owner's Industrial Hygienist (IH) asbestos-containing materials to be removed. Accomplish misting by using a fine spray (mist) of amended water. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. Saturate material through to the substrate sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water to penetrate material thoroughly. Spray material repeatedly during the work process to maintain a continuously wet condition. If a

removal encapsulant is used, apply in strict accordance with manufacturer's written instructions.

Mist the work area continuously with amended water whenever necessary to reduce airborne fiber levels.

As the material is removed, pack material while still wet into labeled 6-mil disposal bags. Do not allow material to dry out. Evacuate air from disposal bags with a HEPA filtered vacuum cleaner before sealing. Use the "gooseneck" procedure to seal bags by twisting the neck of the bags, sealing with duct tape, bending the neck of the bag over, and sealing again with a minimum three wraps of duct tape. Clean outside of bag and move to Wash-Down Station adjacent to Equipment Decontamination Unit.

- **REMOVAL OF ACM DUCT MASTIC/SEALANT:**

Wrap sections of ductwork containing ACM duct mastic/sealant with two (2) layers of 6-mil polyethylene sheeting. Cut or detach ductwork at sections where there is no duct mastic/sealant. Dispose of entire section of ductwork containing the ACM duct mastic/sealant as asbestos waste.

- **REMOVAL OF ACM COATED AIR HANDLER UNIT PANELS:**

Do not cut Ahu panels in areas where interior features ACM coating. Remove mechanical fasteners to reduce Air Handler unit to manageable panels. Continuously mist the work area with amended water. Wrap AHU panels featuring ACM interior coating with two (2) layers of 6-mil polyethylene sheeting. Dispose of entire panel(s) containing the ACM interior coating as asbestos waste.

Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work of this section. Accomplish decontamination as required by the section on Project Decontamination.

CLEAN UP

Dispose of all rags, plastic sheet, etc. as ACM.

Decontaminate Equipment: After the completion of all work, decontaminate all equipment and machinery used for work.

VII. WASTE STORAGE AND DISPOSAL PROCEDURES

All ACM waste materials are to be contained in one of the following: (1) Two 6 mil disposal bags, both bags twisted closed, folded over (gooseneck style), and both bags sealed with duct tape; (2) One 6 mil disposal bag, sealed as previously described placed into a durable leak-tight disposable container; (3) DOT-approved drum; (4) Two layers of 6-mil polyethylene sheeting sealed at seams with duct tape.

Waste stored on the site prior to disposal, must be maintained in a secured, locked location where access is controlled.

LABELING OF DISPOSAL CONTAINERS:

On the outside of the chosen disposal container, the following three labels must be placed and visible:

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

Second Label: Until October 1, 1993, provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR Parts 171 and 172. Hazardous Substances: Final Rule. Published November 21, 1986 and revised February 17, 1987:

Third Label: Provide in accordance with 40 CFR Part 61 (AMENDED), subpart M, section 61.150(a)(1)(v) of EPA's National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Provision. Published November 20, 1990.

All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction. Protect walls, floors, and ceilings of the interior of the truck or dumpster with one layer of 6 mil polyethylene sheeting. Floor sheeting shall be installed first and shall extend up the side wall at least 12 inches and taped securely into place. Wall sheeting shall overlap by at least six inches and be taped into place. Ceiling sheeting shall extend down the sides of the walls at least six inches and be taped into place. Take containers from the Work Area directly to a sealed truck or dumpster. Do not transport disposal bagged materials on open trucks. Comply with any local or state regulations for prior notice and delivery, and comply with any special landfill requirements.

At a disposal site, vehicles shall approach the dump location as closely as possible for unloading of the asbestos waste. Bags, drums and wrapped components shall be inspected when unloaded at the disposal site. Material in damaged containers shall be re-wrapped or re-packed in empty bags or drums. If more than 25% of the bags are broken or damaged, return to work site for re-bagging. Waste containers shall be placed on the ground at the disposal site, not pushed or thrown out. Following the removal of all containerized waste, polyethylene sheeting shall be removed and discarded in bags or drums along with contaminated cleaning materials and protective clothing. Clean cargo area of the truck or dumpster by wet-wiping with amended water and/or using a HEPA vacuum cleaner.

Retain Waste Shipment Records (WSRs) from landfill and/or processor for materials disposed of. At completion of hauling and disposal of each load submit copy of waste manifest and landfill receipts to Owner's Representative and comply with local and state regulations for disposal documentation.

As per NESHAPS 61.150 vii(3)(4) waste shipment records shall be obtained from the landfill/or hauler within 35 days, if not received within 45 days, EPA shall be notified by the contractor of unresponsive records.

VIII. AIR MONITORING AND PROJECT COMPLETION

A qualified and licensed air monitoring firm shall provide all air monitoring and perform all visual inspections.

BACKGROUND AIR MONITORING:

Background monitoring shall be performed both inside and outside of the work areas to establish existing ambient air levels under normal activity conditions. The background samples will be analyzed using Phase Contrast Microscopy (PCM) analysis.

DAILY AREA AIR MONITORING:

The purpose of the Owner's daily area air monitoring is to evaluate quality, resolve problems, and minimize the potential for the spread of contamination beyond the work area. In addition, the work of the Owner's IH includes performance of the final visual inspection and testing to determine whether a space or a building has been adequately decontaminated. All daily air monitoring is to be done utilizing Phase Contrast Microscopy (PCM) except for Final Clearance Monitoring as

specified in the following paragraphs. Owner's Air Monitor will perform the following tasks:

1. Perform continuous air monitoring, inspection and testing inside and outside the work area during actual abatement work to detect any faults in the work area isolation and any adverse impact on surrounding areas from work area activities
2. Perform final inspection and testing of decontaminated areas or buildings at the conclusion of the abatement and clean-up work to certify compliance with decontamination standard.

All data, inspection results, and testing results generated by the Owner's IH will be available to the contractor for information and consideration. Contractor shall provide cooperation and support to the Owner's IH for efficient and smooth performance of their work.

Monitoring and inspection results of the IH may be used to issue any stop removal orders to the contractor during abatement work and to accept or reject an area or a building as decontaminated.

This section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.

STOP ACTION LEVELS:

Inside Work Area: Maintain an average airborne count in the work area of less than .05 f/cc. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8 hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify Owner's Representative. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by Owner's Representative.

If airborne fiber counts exceed 0.1 f/cc cease all work except corrective action. Notify Owner's Representative. Do not recommence work other than corrective action for 24 hours unless otherwise authorized, in writing, by Owner's Representative.

Outside Work Area: If any air sample taken outside of the Work Area exceeds 0.01 f/cc or the base line established by background air monitoring, immediately and automatically stop all work except corrective action. The Owner's Representative will determine the source of the high reading and notify the Contractor in writing.

If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:

- Immediately erect new critical barriers to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (eg. wall, ceiling, floor).
- Decontaminate the affected area in accordance with Project Decontamination Procedures.
- Require that respiratory protection as set forth in Respiratory Protection be worn in affected area until area is cleared for re-occupancy in accordance with Final Clearance Monitoring.
- Leave Critical Barriers in place until completion of work and ensure that the operation of the pressure differential system in the Work Area results in a flow of air from the affected area into the existing Work Area.
- If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a separate decontamination facility consisting of a Shower Room and Changing Room.
- After Certification of Visual Inspection in the Work Area, remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Final Clearance Monitoring.

If the high fiber reading was the result of other causes, initiate the corrective action as determined by the Owner's Representative.

CONTRACTOR RELEASE CRITERIA FOR FINAL WORK AREA CLEARANCE:

1) VISUAL INSPECTION

Final Clearance Monitoring will not begin until the Asbestos Abatement Work Area airborne asbestos structure concentrations have been reduced to the level specified and described in Project

Decontamination is complete, the area has passed a thorough visual inspection by the Owner's Air Monitor and the Project Manager and successful completion of these requirements has been certified by the Owner's Air Monitor and Project Manager. The visual inspection will be performed at the request of the Supervisor following fine cleaning of the work area.

2) ENCAPSULATION

A coating of compatible encapsulant must be applied to porous surfaces that have been stripped and cleaned of ACM. This must be compatible with the substrate of the replacement material.

3) REMOVAL OF PRIMARY BARRIERS

After all encapsulant is thoroughly dry, all primary barriers, if present, must be removed. If any evidence of contamination is observed after removal of the primary barriers, the debris/particulate should be HEPA vacuumed and wet-wiped under not residue remains.

4) FINAL AIR MONITORING

TEM clearance sampling will be required on this project due to the amount of friable ACM present.

Sampling sensitivity in the tables below refer to:

Analytical Sensitivity for TEM analysis as set forth in the analytical method used and/or the AHERA regulation.

TEM samples will be secured as indicated below:

TRANSMISSION ELECTRON MICROSCOPY:

In each homogeneous work area after completion of all cleaning work, a minimum of 5 samples, or sufficient for the size of the project, will be taken and analyzed as follows:

Location Sampled	Number of Samples	Analysis Method	Analytical Sensitivity (fibers/cc)	Recommended Volume (liters)	Rate in Liters per Minute (LPM)
Work Area	A minimum of 5	TEM	0.005	1,200-1,800	1-10
Outside of Work Area	5*	TEM	0.005	1,200-1,800	1-10
Work Area Blank	1	TEM	0.005	0	Open for 30 Seconds
Outside of Work Area Blank	1	TEM	0.005	0	Open for 30 Seconds
Laboratory Blank	1	TEM	0.005	0	Do Not Open

* If samples collected inside of the work area report >70 structures/mm², TEM samples shall be collected outside of the work area.

Analysis will be performed using the analysis method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

Asbestos Structures referred to in this Section include asbestos fibers, bundles, clusters or matrices, as defined by method of analysis.

Release Criteria: Decontamination of the work site is complete if:
The arithmetic mean (average) asbestos concentration is less than 70 structures per square millimeter of filter area.

LABORATORY TESTING AND ANALYTICAL METHODS:

PHASE CONTRAST MICROSCOPY (PCM):

Analysis of background and daily samples will be performed utilizing the methods set forth in NIOSH 7400 method.

TRANSMISSION ELECTRON MICROSCOPY (TEM):

Analysis of clearance samples will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A. Samples will be sent by overnight courier for analysis by Transmission Electron Microscopy. Samples will not be carried on weekends, so that samples shipped on Friday will arrive on the following Monday. Faxed and Verbal results will normally be available during the 2ND working day after receipt of samples by the laboratory. All Transmission Electron Microscopy results will be available to the Contractor.

SAMPLE VOLUMES:

The number and volume of air samples taken by the Owner will be in accordance with all regulations and standards governing air monitoring. Additional samples may be taken at Owner's or Owner's Representatives discretion. If airborne fiber counts exceed allowed limits additional samples will be taken as necessary to monitor fiber levels.

SAMPLE CASSETTES:

PCM: Samples will be collected on 25 mm cassettes with a 0.80 micrometer mixed cellulose ester filter.

TEM: Samples will be collected on 25 mm cassettes with 0.45 micrometer mixed cellulose ester filter.

WRITTEN REPORTS:

Written reports will be posted at the job site on a daily basis, and within 24 hours of collection of the samples. Location will be determined by Owner's Representative and Contractor's General Superintendent. Clearance results shall be posted at the site prior to tear-down of the containment area(s).

ADDITIONAL TESTING:

The Contractor may conduct his own air monitoring and laboratory testing. If he elects to do this the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner.

If clearance samples do not meet clearance criteria, Contractor will be responsible for reimbursement to County for air monitoring and samples cost for re-test.

PERSONAL MONITORING:

Contractor is responsible for performing air monitoring to meet Contractor's OSHA requirements for personnel sampling or any other purpose.

IX. SUBMITTALS

The list below includes the submittal requirements prior to the start of work, and before project closeout. Submittal for the section At Project Closeout must be submitted to the Owner's Representative with the Final Payment Request.

SUBMITTAL CHECKLIST - MANDATORY

Submittal for section Before Start of Work must be turned in to the Owner or the Owner's Representative at the Pre-Construction Meeting. If no Pre-Construction Meeting is held, then the paperwork must be submitted to the Owner's or the Owner's Representative Office 48 Hours before the start of work. The Owner or Owner's Representative will then give the contractor written permission to begin work. The Contractor will not begin work without written permission.

BEFORE START OF WORK

- _____1. Copy of Contractor's SC-DHEC Contractor's License.
- _____2. Copies of SC-DHEC Licenses for each individual that will be working on the job site.
- _____3. SC-DHEC Permit
- _____4. Insurance Certificate

Submittal for the section Periodically During Work or Before Project Closeout must be submitted to the Owner or Owner's Representative with the Progressive Payment Request. If Progressive Payments are not indicated, then the submittals must be turned into the Owner or Owner's Representative Office before the Project Closeout. Contractor must have written permission from Owner or Owner's Representative before beginning Project Closeout.

PERIODICALLY DURING WORK OR BEFORE PROJECT CLOSEOUT

- _____5. Copy of containment checklist filled out by Air Monitor and Contractor
- _____6. Daily Logs filled out and signed by the Project Supervisor
- _____7. Daily Sign In\Sign Out Sheets
- _____8. Contractor's copy of Initial Exposure Assessment
- _____9. Contractor's copy of Negative Exposure Assessment
- _____10. Contractor's copy of Daily Air Monitoring Results
- _____11. Accident and Incident Investigation Report
- _____12. Visitor Log and signed Visitor's Authorization Form
- _____13. Documentation of Manometer Readings and Asbestos Filtration (AFD) and Water Filtration (WFD) Device Inspections
- _____14. Personnel Air monitoring reports

Submittal for the section At Project Closeout must be submitted with the Final Payment Request.

AT PROJECT CLOSEOUT

- _____ 15. Certification of Removal
- _____ 16. Asbestos Chain-of-Custody Form (Trip Ticket) completed by and signed by the Contractor Representative, Transporter and Disposal Site Representative within 35 days as required by NESHAPS 61.150 vii(3)(4)

Copies of the submittals for the section Items to be Submitted by the Air Monitoring Firm should also be obtained by the Contractor and included in the Contractor Submittals as indicated above.

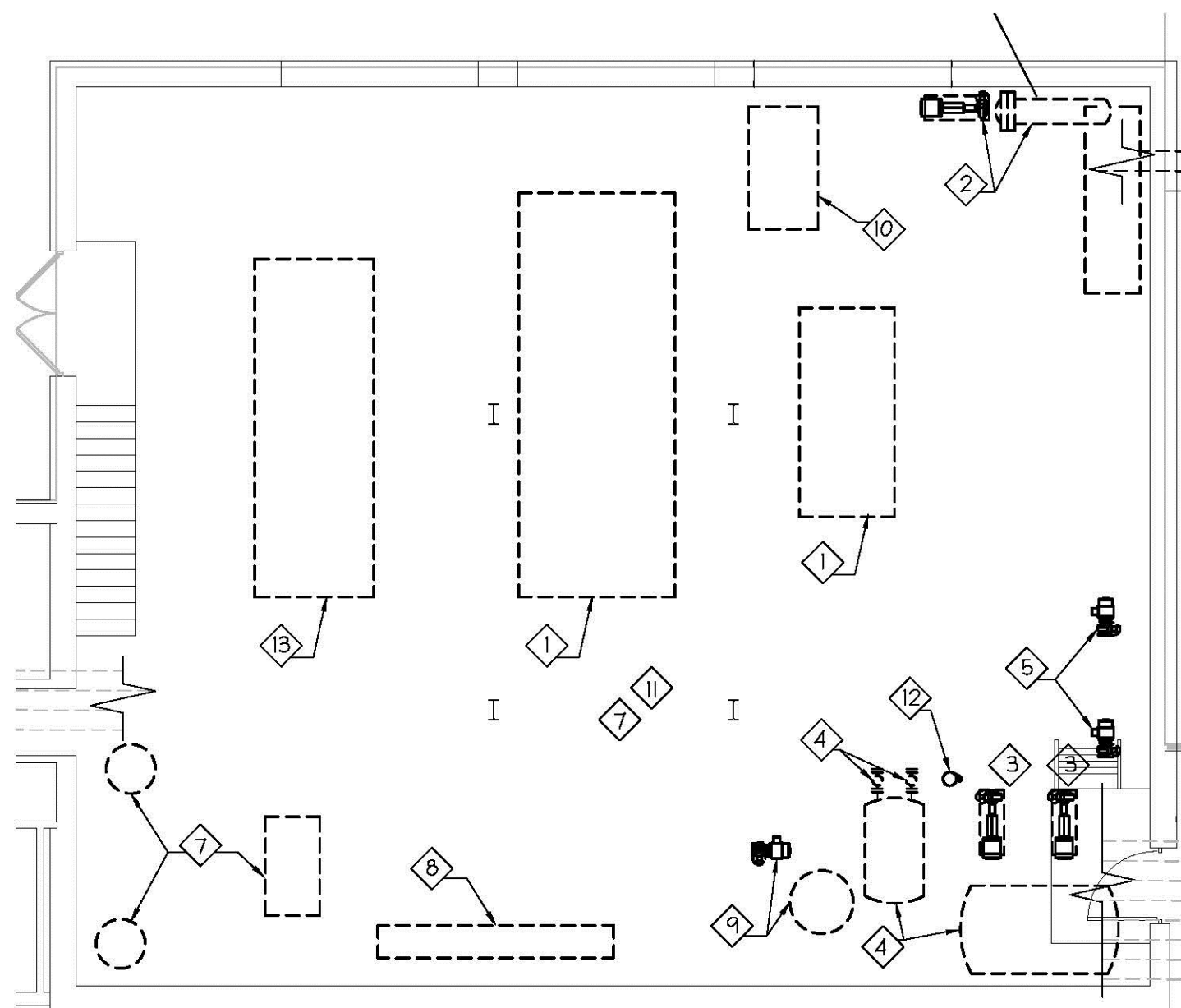
ITEMS TO BE SUBMITTED BY THE AIR MONITORING FIRM(S)

- _____ 17. Air monitoring reports posted within 24 hours
- _____ 18. Summary to owner within 5 days
- _____ 19. Copy of Air Monitor's license(s)

**ATTACHMENT I
DEMO PLANS
(FOR INFORMATIONAL PURPOSES ONLY)**

BOILER ROOM DEMOLITION NOTES

- 1 REMOVE EXISTING BOILER, FLUES, AND ALL STEAM/CONDENSATE PIPING IN THE BOILER ROOM. REMOVE STEAM SAFETY VENT PIPING AND BLOWDOWN VENT PIPING. CAP AND SEAL VENTS WATERTIGHT AT ROOF. SEE HVAC PLAN FOR NEW BOILER & HOT WATER PIPING LAYOUT.
- 2 REMOVE EXISTING "D" WING HOT WATER PUMP, STEAM/WATER CONVERTER, AIR SEPARATOR AND EXPANSION TANK. SEE HVAC PLAN FOR NEW PUMP.
- 3 REMOVE EXISTING BOILER FEED PUMP AND ASSOCIATED PIPING.
- 4 REMOVE EXISTING CONDENSATE RECIEVER AND ASSOCIATED PUMPS & PIPING.
- 5 REMOVE EXISTING HOT WATER PUMP, ASSOCIATED STEAM/WATER CONVERTER,AND ASSOCIATED PIPING AND ACCESSORIES.
- 6 NOT USED.
- 7 PROTECT EXSTING MAKEUP WATER SYSTEM, DOMESTIC COLD WATER SYSTEM, AND DOMESTIC HOT WATER SYSTEM DURING CONSTRUCTION. MODIFY MAKEUP WATER SYSTEM AS INDICATED ON THE HVAC PLAN.
- 8 REMOVE EXISTING STEAM HEADER AND ALL ASSOCIATED PIPING
- 9 TURN OVER EXISTING CHEMICAL TREATMENT PUMPS, TANKS, AND OTHER EQUIPMENT TO CHEMICAL TREATMENT SERVICE COMPANY.
- 10 REMOVE EXISTING FUEL OIL HEATER AND ALL FUEL OIL PIPING INSIDE BOILER ROOM. CAP PIPING AT WALL.
- 11 RECOVER PNEUMATIC ACTUATORS FROM EXISTING 3-WAY VALVES AND TURN OVER TO ONNER.
- 12 REMOVE EXISTING SUMP PUMP.
- 13 EXISTING BOILER SHALL REMAIN IN SERVICE. CONVERT BOILER FROM STEAM TO HOT WATER. PROTECT BOILER DURING CONSTRUCTION. REMOVE ASSOCIATED STEAM PIPING. SEE NEW BOILER ROOM PLAN.



BOILER ROOM ENLARGED DEMOLITION PLAN

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

SHEET TITLES

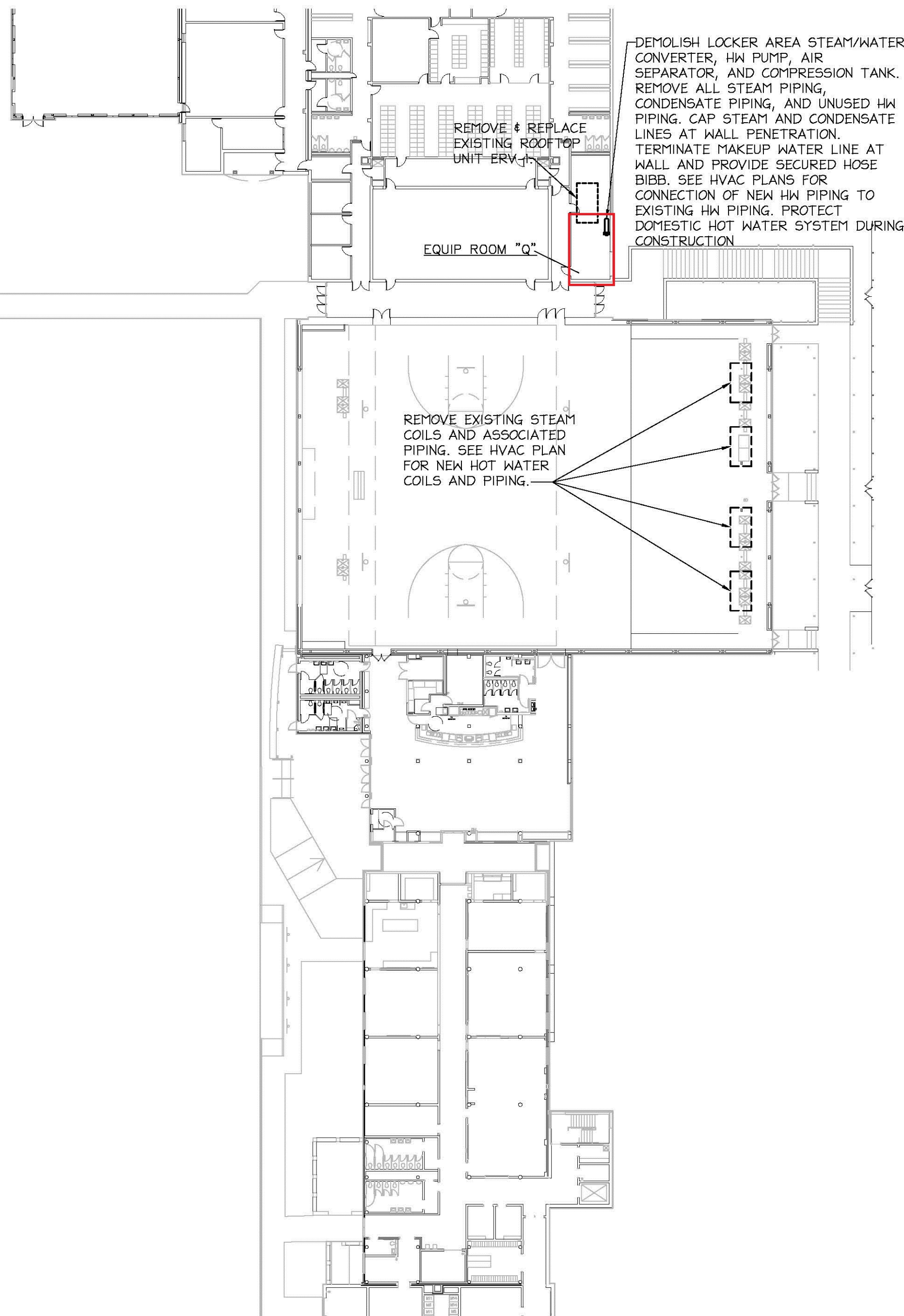
- M001 - OVERALL HVAC DEMO PLAN
- M101 - "D" WING FIRST FLOOR HVAC DEMO PLAN
- M201 - "D" WING SECOND FLOOR HVAC DEMO PLAN
- M301 - "D" WING THIRD FLOOR HVAC DEMO PLAN
- M101 - OVERALL HVAC NEW PLAN
- M102 - ENLARGED MECH. ROOM PLANS, SECTIONS, AND DE
- M103 - KITCHEN, LOCKER & COURTYARD HVAC PLAN
- M110 - "D" WING FIRST FLOOR HVAC PLAN
- M120 - "D" WING SECOND FLOOR HVAC PLAN
- M130 - "D" WING THIRD FLOOR HVAC PLAN
- M140 - "D" WING PENTHOUSE PLANS, SECTIONS, AND DET
- M210 - "D" WING FIRST FLOOR HVAC PIPING
- M220 - "D" WING SECOND FLOOR HVAC PIPING PLAN
- M230 - "D" WING THIRD FLOOR HVAC PIPING PLAN
- M301 - HVAC SCHEDULES
- M302 - HVAC SCHEDULES
- M400 - HVAC DETAILS
- M401 - HVAC DETAILS

GENERAL NOTES:

- 1) PROVIDE ACCESS DOORS AT EACH MOTORIZED DAMPER AND EACH FIRE DAMPER (EXISTING AND NEW) IF NOT ALREADY ACCESSIBLE FROM A GRILLE; SEE SPECS FOR SIZE.
- 2) PROVIDE 27" MIN CLEARANCE AT FILTER HOUSINGS FOR FILTER REMOVAL
- 3) SEE ARCH. DWGS FOR EXACT LOUVER AND BRICK VENT LOCATIONS.
- 4) RUN HOT WATER AND CHILLED WATER PIPING MINIMUM 6'-8" ABOVE MECH. ROOM FLOOR. COORDINATE WITH ENGINEER WHERE NOT POSSIBLE.
- 5) PIPE ALL CONDENSATE LINES TO NEAREST FLOOR DRAIN.
- 6) SLOPE ALL CONDENSATE LINES MIN. 1/8" PER FOOT
- 7) MINIMUM BRANCH CONDENSATE LINE SIZE SHALL BE 1" UNLESS NOTED OTHERWISE ON PLANS.
- 8) BLANK OFF UNUSED LOUVER WITH SHEET METAL AND 1" THICK, 6 PCF FOIL-FACED DUCT BOARD.
- 9) MAXIMUM LENGTH OF FLEXIBLE DUCTWORK AT END OF BRANCH DUCTWORK SHALL BE 6'-0"
- 10) CONCRETE HOUSEKEEPING PADS SHALL BE BY OTHER DIVISIONS, SEE "A" DWGS.
- 11) FIELD COORDINATE ROUTING OF DUCTWORK PRIOR TO DUCTWORK FABRICATION.
- 12) HVAC CONTRACTOR TO COORDINATE EXACT LOCATION OF DUCT WORK WITH GENERAL CONTRACTOR (PRIOR TO FABRICATION) TO AVOID POTENTIAL CONFLICT WITH SOUND WALLS EXTENDED TO THE DECK, ETC.
- 13) ROOF CURBS / CURB ADAPTERS FOR ALL ROOF EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. ROOFER TO FLASH AND SEAL ROOFING TO CURB. PROVIDE CURB INSIDE AND OUTSIDE DIMENSIONS TO ROOF MFR.
- 14) SEAL PENETRATIONS OF NON-FIRE RESISTANCE RATED ASSEMBLIES WITH AN APPROVED NON-COMBUSTIBLE MATERIAL.
- 15) PIPE RELIEF VENTS TO OUTSIDE:
BOILERS & WATER HEATERS: (FOR EACH UNIT.)
RELIEF VALVES FULL SIZE (EA.); PRV VENT FULL SIZE (EA.); GAS TRAIN VENT SHALL BE SIZED AS FOLLOWS:
FUEL LINE DIA. UP TO 1-1/2" 2" 2-1/2" 3" 4" 5" 6" 8"
VENT LINE DIA. 3/4" 1" 1-1/4" 1-1/4" 2" 2" 2-1/2" 3-1/2"

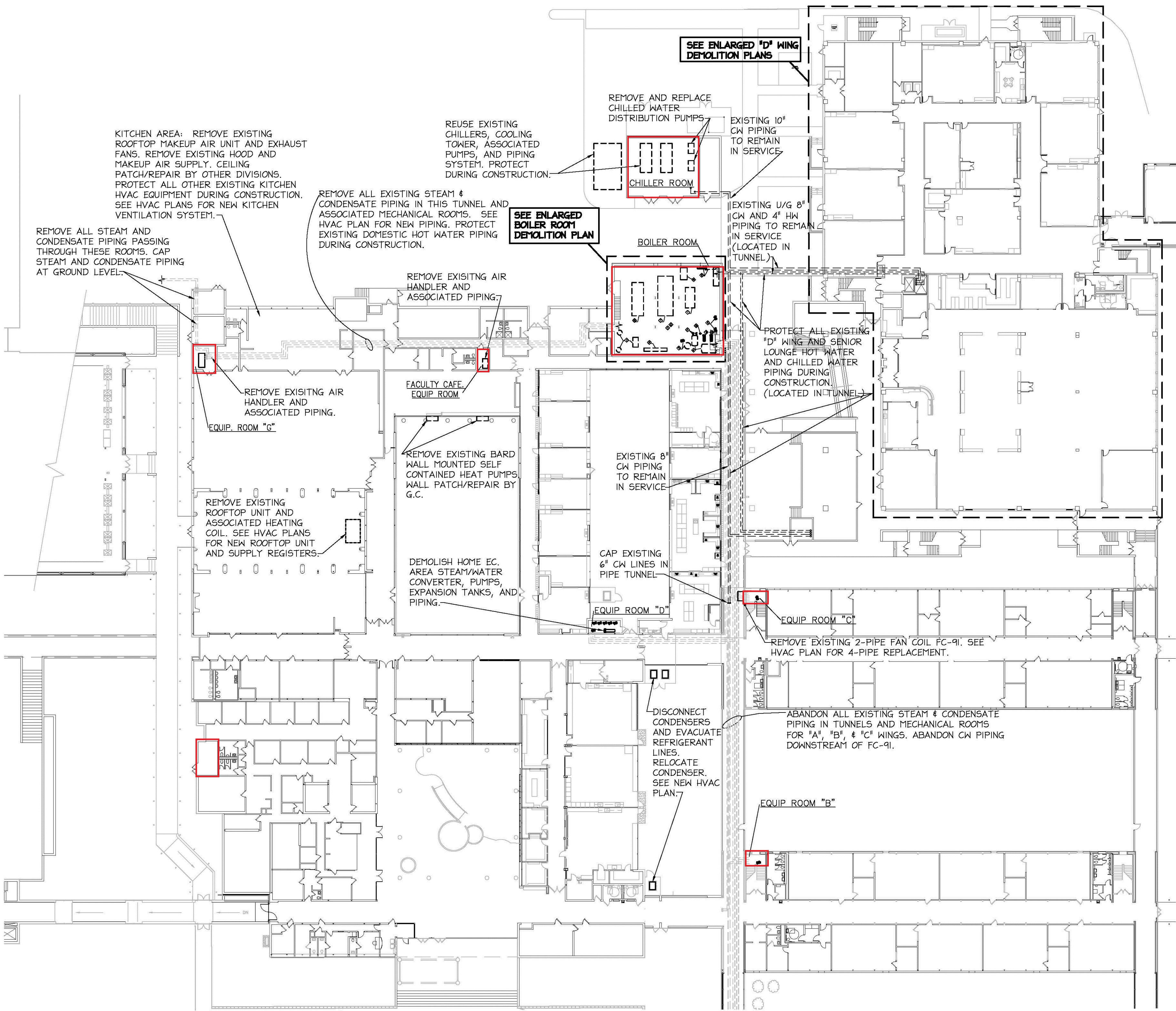
SYMBOLS

- NEW DUCT OR PIPE
- EXISTING DUCT OR PIPE
- HWS HOT WATER SUPPLY
- HWR HOT WATER RETURN
- CWS CHILLED WATER SUPPLY
- CWR CHILLED WATER RETURN
- D DRAIN
- G GAS
- GATE VALVE
- CHECK VALVE
- GLOBE VALVE
- BALL VALVE (2" AND SMALLER)
- BUTTERFLY VALVE (2-1/2" AND LARGER)
- CONTROL VALVE
- REDUCER
- UNION
- PRESSURE GAUGE
- THERMOMETER WITH WELL
- THERMOSTAT
- HUMIDISTAT
- CO2 SENSOR
- SUPPLY AIR (S.A.)
- RETURN AIR (R.A.)
- EXHAUST AIR
- RELIEF AIR
- ACCESS DOOR
- FIRE DAMPER
- STRAINER
- CIRCUIT SETTER
- TEMP/PRESS SENSING PORT
- REFRIGERANT LINES
- MOTORIZED DAMPER
- TRIPLE DUTY VALVE
- PRESSURE REDUCING VALVE
- FLEXIBLE COUPLING
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- AUTO FLOW VALVE
- P.I.C. VALVE
- SMOKE DETECTOR
- DIFFERENTIAL PRESS. SENSOR
- STATIC PRESSURE SENSOR
- OVERHEAD
- UNDERGROUND
- VOLUME DAMPER
- CLEAN OUT
- DUAL WALL SPIRAL DUCTWORK
- DUCT TO BE DEMOLISHED



GROUND FLOOR DEMOLITION PLAN

SCALE: 1/32" = 1'-0"



FIRST FLOOR DEMOLITION PLAN

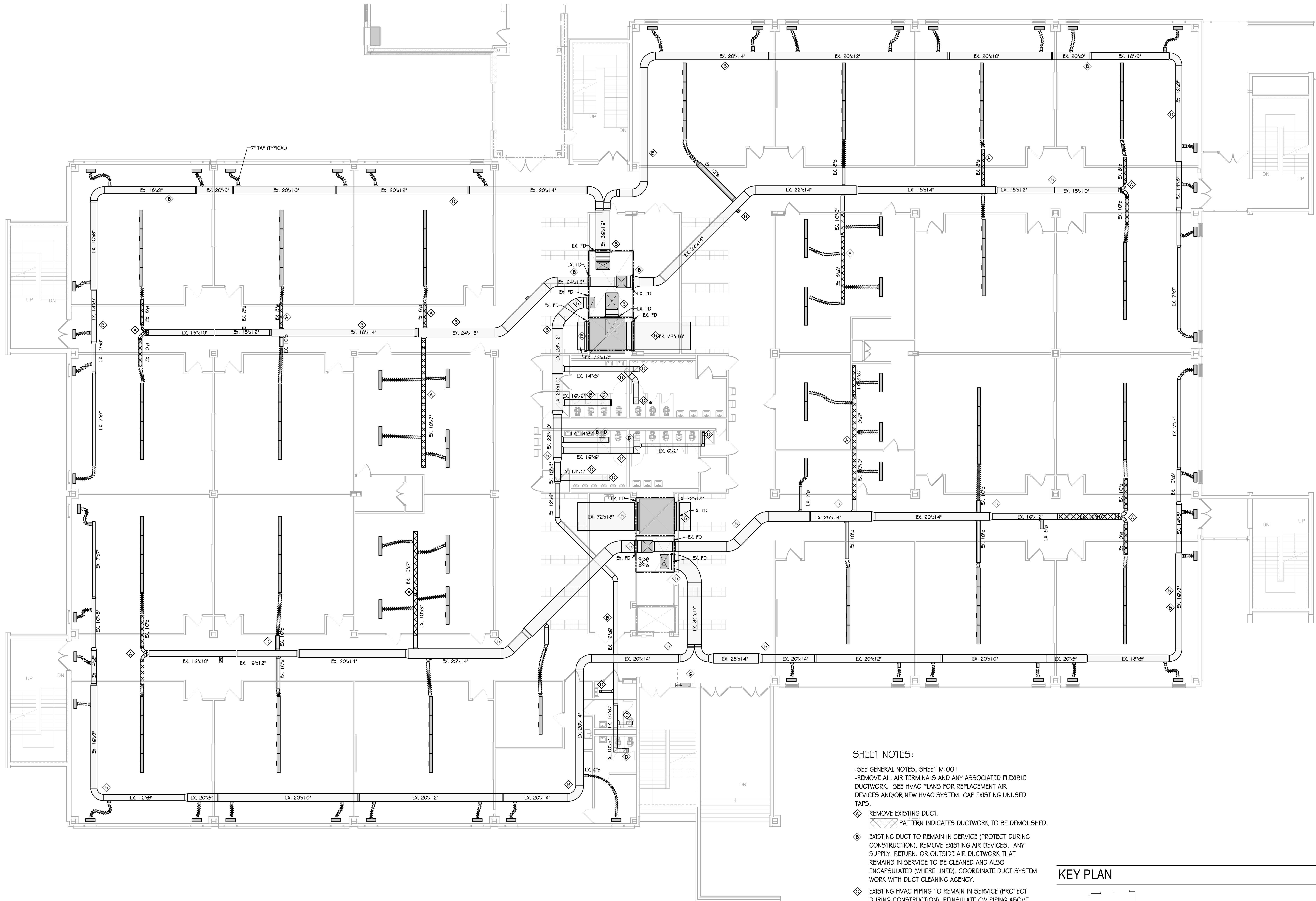
SCALE: 1/32" = 1'-0"

A



M010

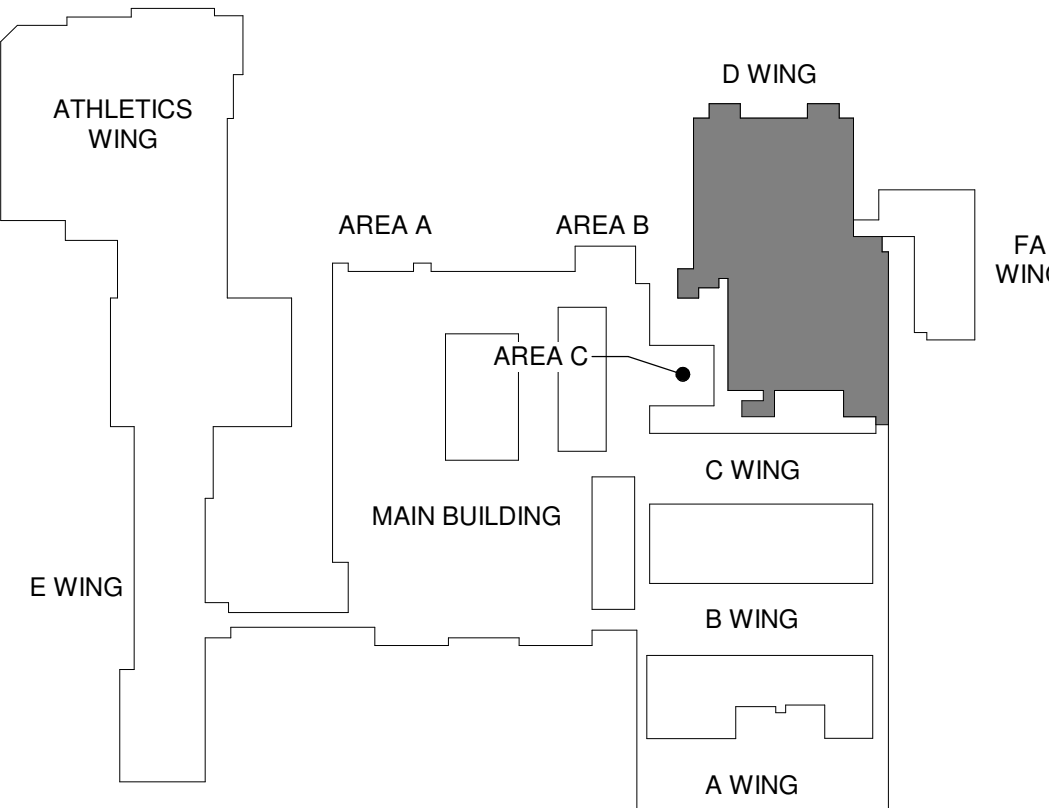
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"D" WING SECOND FLOOR HVAC DEMO PLAN
1/8" = 1'-0"
(ROTATED 90 DEGREES COUNTER-CLOCKWISE FROM KEY PLAN)

- SHEET NOTES:**
- SEE GENERAL NOTES, SHEET M-001
 - REMOVE ALL AIR TERMINALS AND ANY ASSOCIATED FLEXIBLE DUCTWORK. SEE HVAC PLANS FOR REPLACEMENT AIR DEVICES AND/OR NEW HVAC SYSTEM. CAP EXISTING UNUSED TAPS.
 - ◇ REMOVE EXISTING DUCT.
Pattern indicates ductwork to be demolished.
 - ◇ EXISTING DUCT TO REMAIN IN SERVICE (PROTECT DURING CONSTRUCTION). REMOVE EXISTING AIR DEVICES. ANY SUPPLY, RETURN, OR OUTSIDE AIR DUCTWORK THAT REMAINS IN SERVICE TO BE CLEANED AND ALSO ENCAPSULATED (WHERE LINED). COORDINATE DUCT SYSTEM WORK WITH DUCT CLEANING AGENCY.
 - ◇ EXISTING HVAC PIPING TO REMAIN IN SERVICE (PROTECT DURING CONSTRUCTION). REINSULATE CW PIPING ABOVE GRADE INSIDE "D" WING. SEE SPECS.
 - ◇ REMOVE AND REPLACE EXISTING AIR DEVICE. SEE HVAC PLAN.
 - ◇ REMOVE EXISTING DUCT, AIR DEVICE AND FIRE DAMPER SERVING STAIRWELL. CAP DUCT. WALL INFILL AND WALL/CEILING PATCH/REPAIR BY G.C.
 - ◇ REMOVE AND REPLACE EXISTING FAN COIL. RECONNECT TO EXISTING PIPING. WALL PATCH / PAINT BY G.C.
 - ◇ REMOVE EXISTING VRF SYSTEM, INCLUDING AIR HANDLERS, PIPING, AND HEAT RECOVERY BOXES. TURN OVER CONDENSERS TO OWNER.
 - ◇ EXISTING 1:1 DUCTLESS SPLIT SYSTEMS TO REMAIN IN SERVICE. PROTECT DURING CONSTRUCTION.

KEY PLAN



SPARTANBURG SCHOOL DISTRICT SEVEN
SPARTANBURG HIGH SCHOOL CONVERSION TO
MCCRACKEN MIDDLE SCHOOL

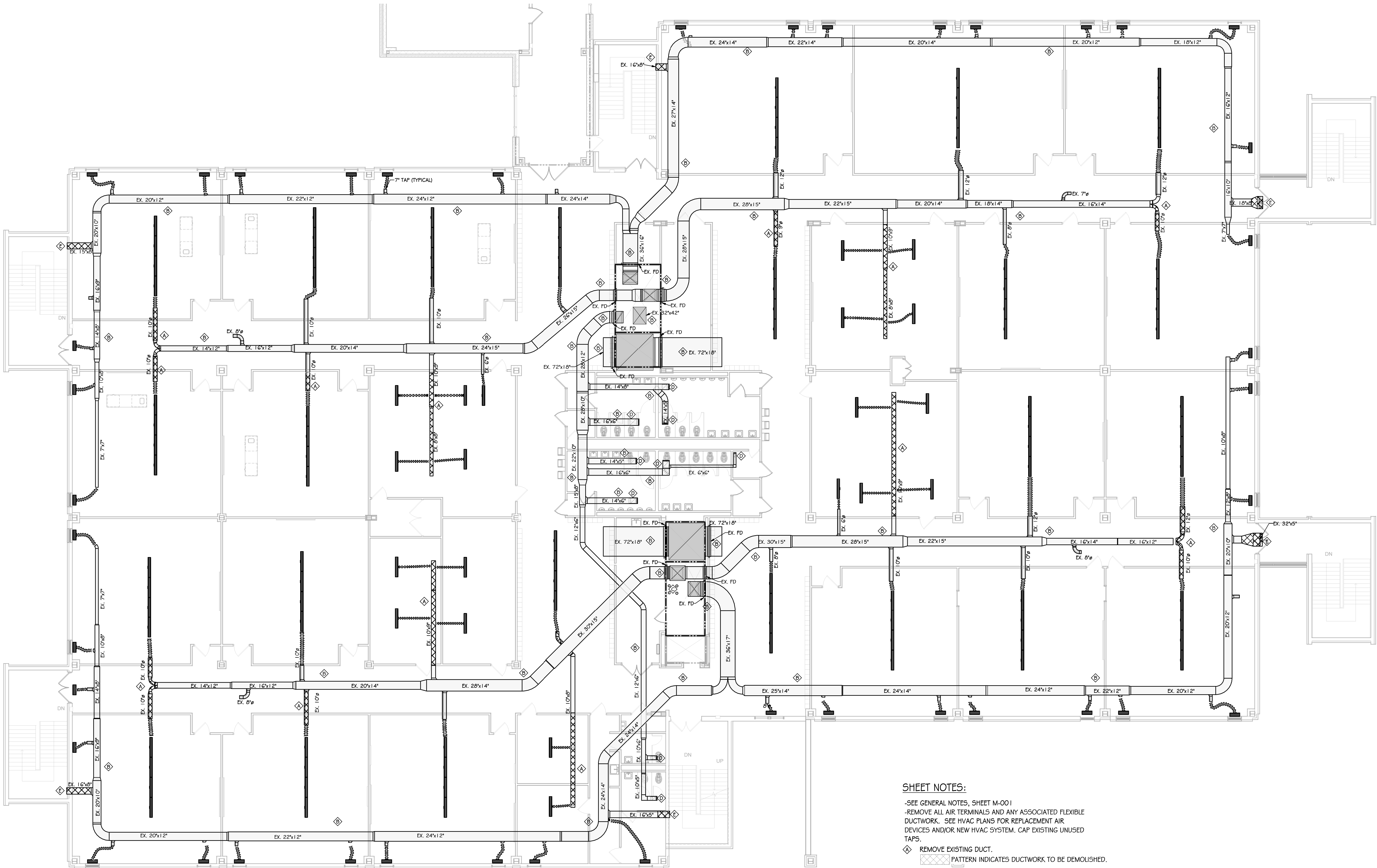
SHEET ISSUE:			
NO.	DATE	DESCRIPTION	BY

CONSTRUCTION DOCUMENTS		04-30-19	
PRINCIPAL IN CHARGE:		WHC	
PROJECT ENGINEER:		WHC	
DRAWN BY:		HFC	
SHEET TITLE:			
"D" WING SECOND FLOOR HVAC DEMO PLAN			
SHEET NO.		CBE PROJ. NO. 1819	

M020



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ATTACHMENT II
BID FORM

**BID FORM
FOR
ASBESTOS ABATEMENT
SPARTANBURG SCHOOL DISTRICT SEVEN
NEW MCCrackEN MIDDLE SCHOOL
PROJECT DESIGN #: PD19-0670-17010**

CONTRACTOR: _____

SC-DHEC CONTRACTOR'S LICENSE NUMBER: _____

I, the undersigned, certify that this proposal does not violate any Federal or State Antitrust Laws.

Bidder's Federal Identification Number: _____

In compliance with the invitation and subject to all conditions thereof, the undersigned offers and agrees to furnish all labor, materials, equipment, appliances, and services necessary for the following project:

SCOPE OF WORK

The scope of work will include abatement of all asbestos-containing materials in the Boiler Room, Chiller Room, D-wing penthouse and specified mechanical closets/penthouses; the abatement of limited HVAC duct mastic/union sealant, black pipe mastic, and drywall/joint compound in D-Wing; and the abatement of asbestos-containing ceiling texture in the Cafeteria air handler closet and adjacent east hallway.

BASE BID:

MATERIAL	APPROXIMATE QUANTITY	LOCATION(S)
Drywall Joint Compound	14,500 sq. ft. (Accounts for multiple layers)	Located in 201D.1, 204D.1, 204D.2, 205D.1, perimeter walls of central section on D-Wing 2nd floor, 308D, 304D.1, 304D.2, perimeter walls of central section on D-Wing 3rd Floor. Please Note: This quantity does not include 1" green wallboard with metal brackets in chases and void spaces within central sections of D-Wing 2nd and 3rd floors. Please Note: This quantity is based off of a 10' finished height for drywall, as the walls are unfinished above this point. Floor to decking height is 14.5'.

MATERIAL	APPROXIMATE QUANTITY	LOCATION(S)
12" x 12" Brown Vinyl Floor Tile & Black Mastic	1,350 sq. ft.	Located in 308D, 304D.1, 304D.2, 201D.1, 204D.1 & 204D.2.
Red/Brown HVAC Duct Mastic & Duct Union Gasket Material on Galvanized Box Duct	100 ln. ft.	Located throughout all floors of D-Wing; select demo of existing HVAC duct will occur. See M010, M020 & M030.
Black Mastic Over Fiberglass on Elbows/Fittings	100 ln. ft.	Located on limited fiberglass elbows throughout D-Wing above ceiling grid.
Tank Insulation	100 sq. ft.	Located on suspended tank in back, right corner of Chiller Room.
Rope Gasket	19 ln. ft.	Located on the Kewanee Classic III Boiler doors in Boiler Room.
Canvas Tabs	1 sq. ft.	Located on the Kewanee Classic III Boiler doors in Boiler Room.
Hard Joint/Fitting Insulation	60 Fittings	Located on east wall of Boiler Room. Please Note: Quantity does not include roof drains due to inaccessibility.
Pipe Run Insulation	554 ln. ft.	Located on east wall of the Boiler Room.
Hard Joint/Fitting Insulation	80 Fittings	Located on the south wall (steam header) of the Boiler Room. Please Note: Quantity does not include roof drains due to inaccessibility.
Pipe Run Insulation	355 ln. ft.	Located on the south wall (steam header) of the Boiler Room.
Exterior Insulation & Canvas	600 sq. ft.	Located on the Kewanee Firebox in the Boiler Room.
Perimeter Sealant/ Crack Filler	60 ln. ft.	Located in the gaps at the base of the Kewanee Firebox in the Boiler Room.
Hard Joint/ Fitting Insulation	106 Fitting	Located throughout the D-Wing penthouse.
Silver Duct Sealant	60 ln. ft.	Located at duct work seams throughout D-Wing penthouse.
Hard Joint/ Fitting Insulation	24 Fittings	Located in the A-Wing, B-Wing and C-Wing mech. closets under stairwells; Equipment Room G (AHU2); Faculty Café Equipment Room (AHU3).
AHU Interior Mastic Coating	180 sq. ft.	Located inside the air handlers of Equipment Room G (AHU2) and Faculty Café Equipment Room (AHU3).
Ceiling Texture	168 sq. ft.	Located on ceiling of Equipment Room G (AHU2) off Cafeteria.
AHU Flex Material (White)	34 ln. ft.	Located on the air handlers of Equipment Room G (AHU2) off Cafeteria and Faculty Café Equipment Room (AHU3).
Ceiling Texture	990 sq. ft.	Located on ceiling of hallway adjacent to east Cafeteria storefront.

TOTAL BASE BID:

_____ (\$ _____)

UNIT RATE PRICE PER LINEAR FOOT OF ACM BLACK MASTIC ABATEMENT IN D-WING IN EXCESS OF 100 LINEAL FEET:

_____ (\$ _____)

UNIT RATE PRICE PER LINEAR FOOT OF ACM DUCT MASTIC/UNION SEALANT ABATEMENT IN D-WING IN EXCESS OF 100 LINEAL FEET:

_____ (\$ _____)

ADDITIONAL COST FOR PERFORMANCE AND PAYMENT BOND, IF REQUIRED:

_____ (\$ _____)

Respectfully Submitted, This _____ day of _____, 2019.

By _____
(Corporation Name)

(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

(Authorized Signature)

(Title)

Business Address _____

Phone Number _____

