UConn

Project #901803
Gant Building Renovations – STEM
Phase 0 – Investigation and Mock-ups

Construction Bid – Addendum 3

September 30, 2016

A. General Requirements

When submitting your proposal, please indicate acknowledgement of this Addendum under "Addenda" in Exhibit G. Include any price adjustments necessary as a result of new/ revised bid documents under Exhibit G Pricing Schedule.

****Note all bids will be evaluated on best overall value which may include the alternate pricing.***

B. Attachments:

Please review all attachments in their entirety for inclusion into the base bid documents. All attachments can be downloaded from https://whiting-turner.box.com/s/e9i8q1919exly4fqmn0e5yjwpysy9zgb

1. Updated Connecticut Department of Labor Wage rates for the UConn Gant Building Renovation project date Thursday, September 29, 2016.
2. **Tighe & Bond** – Spec Section 01350 – Health & Safety Plan
3. **Tighe & Bond** – Spec Section 02120 – Transportation and Disposal of Contaminated Materials
4. **Tighe & Bond** – Spec Section 13281 – Asbestos Abatement
5. **Tighe & Bond** – Spec Section 13282 – Lead Paint Awareness
6. **Tighe & Bond** – Spec Section 13286 – Assumed PCB Contaminated Building Materials Abatement

C. Scope Modifications:

Unit 02A – Demolition and Haz-Mat Abatetment Package.

Provide the following scope items in Exhibit B:

1. Unit 02A Demo & Abatement Package to provide all work associated with hazardous material abatement, per Tighe & Bond Spec Sections 01350, 02120,13281, 13282, and 13286, issued with the addendum.

All Bid Packages.

Incorporate the Attached Updated Connecticut Department of Labor Wage rates for the UConn Gant Building Renovation project.

Bid due date: The bid date remains October 11, 2016 at 12:00 p.m.

Minimum Rates and Classifications for Building Construction

ID# : B 22718

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: 901803
Project Town: Mansfield
State#:
FAP#:

Project: University Of Connecticut Gant Building Renovations

CLASSIFICATION	Hourly Rate	Benefits
1a) Asbestos Worker/Insulator (Includes application of insulating materials, protective coverings, coatings, & finishes to all types of mechanical systems; application of firestopping material for wall openings & penetrations in walls, floors, ceilings	35.75	28.82
1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters.**See Laborers Group 7**		
1c) Asbestos Worker/Heat and Frost Insulator	37.15	27.56

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2) Boilermaker	35.24	25.01
3a) Bricklayer, Cement Mason, Concrete Finisher (including caulking), Stone Masons	33.48	29.16 + a
3b) Tile Setter	34.30	24.15
3c) Terrazzo Mechanics and Marble Setters	31.69	22.35
3d) Tile, Marble & Terrazzo Finishers	26.43	20.59
3e) Plasterer	33.48	29.16

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------LABORERS------

4) Group 1: Laborers (common or general), acetylene burners, carpenter tenders, concrete specialists, wrecking laborers, fire watchers.	28.55	18.90
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofer/mixer/nozzleman (Person running mixer and spraying fireproof only).	28.80	18.90
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	29.05	18.90
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is $26.80.	28.80	18.90
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	29.30	18.90

4e) Group 6: Blasters, nuclear and toxic waste removal.	31.55	18.90
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	29.55	18.90
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	28.38	18.90
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	27.86	18.90
4i) Group 10: Traffic Control Signalman	16.00	18.90
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	32.00	24.42

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5a) Millwrights	32.47	24.84
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	38.65	24.42+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	49.00	29.985+a+b
-----LINE CONSTRUCTION----		
Groundman	24.99	6.25%+11.81
Linemen/Cable Splicer	45.43	6.25%+20.70

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8) Glazier (Trade License required: FG-1,2)	35.58	20.15 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	35.22	31.99 + a
----OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer 2 drums or over, front end loader (7 cubic yards or over), work boat 26 ft. and over and Tunnel Boring Machines. (Trade License Required)	38.55	23.55 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	38.23	23.55 + a
Group 3: Excavator; Backhoe/Excavator under 2 cubic yards; Cranes (under 100 ton rated capacity), Grader/Blade; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	37.49	23.55 + a

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper).	37.10	23.55 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	36.51	23.55 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller; Pile Testing Machine.	36.51	23.55 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	36.20	23.55 + a
Group 7: Asphalt roller, concrete saws and cutters (ride on types), vermeer concrete cutter, Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrell).	35.86	23.55 + a
Group 8: Mechanic, grease truck operator, hydroblaster; barrier mover; power stone spreader; welding; work boat under 26 ft.; transfer machine.	35.46	23.55 + a

Group 9: Front end loader (under 3 cubic yards), skid steer loader regardless of attachments, (Bobcat or Similar): forklift, power chipper; landscape equipment (including Hydroseeder).	35.03	23.55 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	32.99	23.55 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	32.99	23.55 + a
Group 12: Wellpoint operator.	32.93	23.55 + a
Group 13: Compressor battery operator.	32.35	23.55 + a
Group 14: Elevator operator; tow motor operator (solid tire no rough terrain).	31.21	23.55 + a

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	30.80	23.55 + a
Group 16: Maintenance Engineer/Oiler.	30.15	23.55 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	34.46	23.55 + a
Group 18: Power safety boat; vacuum truck; zim mixer; sweeper; (Minimum for any job requiring a CDL license).	32.04	23.55 + a
------PAINTERS (Including Drywall Finishing)------		
10a) Brush and Roller	32.02	20.15

10b) Taping Only/Drywall Finishing	32.77	20.15
10c) Paperhanger and Red Label	32.52	20.15
10e) Blast and Spray	35.02	20.15
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	40.62	29.71
12) Well Digger, Pile Testing Machine	33.01	19.40 + a
13) Roofer (composition)	34.12	18.58

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14) Roofer (slate & tile)	34.62	18.58
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	36.00	34.51
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	40.62	29.71
------TRUCK DRIVERS------		
17a) 2 Axle	28.83	21.39 + a
17b) 3 Axle, 2 Axle Ready Mix	28.93	21.39 + a

17c) 3 Axle Ready Mix	28.98	21.39 + a
17d) 4 Axle, Heavy Duty Trailer up to 40 tons	29.03	21.39 + a
17e) 4 Axle Ready Mix	29.08	21.39 + a
17f) Heavy Duty Trailer (40 Tons and Over)	29.28	21.39 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	29.08	21.39 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	41.37	20.77 + a

19) Theatrical Stage Journeyman	25.76	7.34

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $3.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

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Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: **Thursday, September 29, 2016**

SECTION 01350

HEALTH & SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Furnish all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor personnel.

2. Develop a site specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered including but not limited to site specific hazards described in Divisions 2 and 13 and those noted in the Existing Conditions Report prepared by Tighe & Bond. This HASP shall meet all OSHA requirements.

3. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site.

1.2 REFERENCES

A. OSHA Regulation 29 CFR 1910.120

B. OSHA Regulation 29 CFR 1926.62

1.3 DEFINITIONS

A. Site Safety Official (SSO) - The individual located on a hazardous waste site who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

B. Uncontrolled Hazardous Waste Site - An area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both.

1.4 SUBMITTALS

A. Informational Submittals

1. Submit the following within 10 days after the Effective Date of the Agreement.

a. Site-specific HASP including the Emergency Response Plan for review, including provisions for decontamination and a contingency plan for unforeseen emergencies. The Engineer's review is only to determine if the HASP meets basic regulatory requirements and the

minimum requirements of this section. The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.

1) The HASP must be reviewed, approved, and signed by a Certified Industrial Hygienist (CIH) or a Certified Safety Professional (CSP).

b. Current certification of employee's health and safety training and certification of employee's baseline medical exam status.

c. Certification of additional required health and safety training for supervisors.

d. Qualifications and experience of the SSO for review.

2. Submit minutes of weekly safety meetings at periodic progress meetings.

1.5 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of them.

B. Work under this contract is not being performed on an "Uncontrolled Hazardous Waste Site," as defined in 29 CFR 1910.120 and Article 1.3 B, above. Develop and follow a site specific HASP in accordance with the requirements of 29 CFR 1910.120 and paragraph 1.6.

C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.

D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.

E. Conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.

F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.

G. In areas where contaminated media are likely to be encountered, monitor air quality in and around work area using appropriate air monitoring equipment, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.

H. At all times, prevent oil or other hazardous substances from entering the ground, sewers, drainage areas and piping systems.

I. Contractor is solely responsible for ensuring that proper access and egress is provided at each individual work area in accordance with all applicable laws and regulations.

1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

A. The following items shall be addressed in the HASP:

1. safety and health hazard assessment;
2. procedures for emergency medical treatment and first aid;
3. map indicating route and driving directions to hospital for emergency medical care;
4. equipment decontamination procedures;
5. air monitoring procedures and action levels;
6. personal protective equipment and decontamination;
7. physical hazard evaluation and abatement including:
    a. equipment operation;
    b. confined space entry;
    c. slips and falls;
    d. building collapse;
    e. falling debris;
    f. encountering unmarked utilities;
    g. cold and heat stress;
    h. hot work (cutting and welding);
    i. excavation entry;
8. training requirements;
9. recordkeeping requirements;
10. emergency response plan that includes:
    a. names of three (3) Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency;
    b. evacuation routes and procedures;
    c. emergency alerting and response procedures.

1.7 CONTINGENCY MEASURES & NOTIFICATIONS

A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Engineer are described herein.

B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photo-ionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.

C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, Evacuate the area immediately. The SSO shall then notify the Engineer and the Owner of the situation.

D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photo-ionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.

E. Notify the Engineer and the Owner regarding the presence of potentially hazardous materials. The Owner may direct the Contractor to notify regulators and to obtain necessary regulatory approvals for remediation.

F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Engineer's direction. The Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the General Conditions, if not covered under a specific bid item.

PART 2 PRODUCTS

2.1 AIR MONITORING EQUIPMENT

A. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.

B. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.

C. Provide and maintain all air monitoring equipment required to monitor abatement conditions as described in Division 13.

D. All air monitoring equipment shall remain the property of the Contractor.

E. Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM-10) at a level of 100 micrograms per cubic meter (mcg/m^3). Contractor will outline the dust monitoring program in their HASP.

F. All readings must be recorded and be available for State (DEEP and DPH) personnel to review.

END OF SECTION

SECTION 02120

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Transportation and disposal of contaminated materials collected, consolidated, and generated during performance of the Work.

2. Coordination, loading, transportation and disposal of contaminated materials.

B. Related Sections

1. Section 01350, Health & Safety Plan

2. Section 13281, Asbestos Abatement

3. Section 13282, Lead-Based Paint Awareness

4. Section 13286, Assumed PCB Contaminated Building Material Abatement

1.2 DEFINITIONS

A. Disposal: The discharge, deposit, injection, dumping, spilling, leaking, incineration or placing of any contaminated material or otherwise hazardous substance into or on any land or water so that such hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

B. Generator: Any person, by site, whose act or process produces hazardous waste, or whose act first causes an oil or hazardous material to become subject to regulation.

C. Regulated Waste: Non-Resource Conservation and Recovery Act (RCRA) hazardous wastes such as oils, petroleum products or residuals, chemical liquids, chemical gases or vapors, non-Toxic Substances Control Act (TSCA) polychlorinated biphenyls (PCBs), waste chemical solids, including materials, and other contaminated material wastes not defined as RCRA Hazardous, TSCA-regulated, or Special Waste.

D. Manifest: An approved form used as a shipping document to identify the quantity, composition, and the origin, routing, and destination of regulated or hazardous waste from the site of generation to the point of disposal, treatment, storage, or use.

E. Shipping Paper: An invoice, bill of lading, or other shipping document serving a similar purpose; other than a hazardous waste manifest used to document the conveyance of materials between different locations, including regulated wastes when applicable.

F. Treatment: Any method, technique or process, including neutralization, incineration, stabilization or solidification, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste less hazardous, non-hazardous, safer to transport, amenable to storage, or reduced in volume, except such method or technique as may be included as an integral part of a manufacturing process at the point of generation.

G. TSCA/RCRA Landfill: This type of landfill is permitted to accept material that contains PCB at levels of 50 ppm to 500 ppm, acceptable for landfill disposal as defined in 40 CFR Part 761; material that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261 but meets the treatment standards established in 40 CFR Part 268 - Land Disposal Restrictions; and all other material classified as a hazardous waste in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations. This type of landfill shall be approved to operate under a Federal Part B operating permit and shall be permitted to accept material with PCB concentrations up to 500 ppm under TSCA. The landfill shall be designed with a double composite liner meeting minimum RCRA design requirements. The landfill shall operate a leachate collection system and shall also operate a leak detection well system. The landfill shall be capable of stabilizing materials for meeting requirements of the USEPA's present rules required under the 1984 amendments to RCRA, banning the land disposal of hazardous material.

H. RCRA Landfill: This type of landfill is permitted to accept material that contains PCBs levels below 50 ppm; material that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261 but meets the treatment standards established in 40 CFR Part 268 - Land Disposal Restrictions and all other material classified as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations. This type of landfill shall be approved to operate under a Federal Part B operating permit. The landfill shall be designed with a double composite liner meeting minimum RCRA design requirements. The landfill will operate a leachate collection system and will also operate a leak detection well system. The landfill shall be capable of stabilizing materials for meeting requirements of the land ban.

I. Non-RCRA Out-of-State Lined Landfill: This type of landfill shall be state approved or permitted to accept material that is defined as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; material containing PCBs below 50 ppm; and all other material not permitted or unsuitable for in-state disposal or recycling.

J. Out-of-State Recycling Facility: This type of facility shall be state approved or permitted to accept material that is defined as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; material containing PCBs below the facility's permitted level; and all other material not permitted or unsuitable for in-state disposal or recycling.

K. In-State Recycling Facility: This type of facility shall be approved by the State of Connecticut to accept material that is classified as petroleum contaminated material, that would be classified as a hazardous material in CGS Section 22a-114 to 22a-134z

Hazardous Waste Regulations if not managed under in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

L. Landfill Facility (Reuse as Cover Material): This type of facility shall be approved by the State in which the landfill is located to accept material that is classified as polluted material, that would be classified as a hazardous material in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations if not managed under in CGS Section 22a-114 to 22a-134z Hazardous Waste Regulations; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

1.3 SUBMITTALS

A. Submit all pertinent information relating to the transport and disposal of materials specified herein, within 14 days after issuance of the Notice to Proceed and prior to transport and disposal. The information submitted be in one package and shall include the following, as a minimum:

1. Information for proposed treatment/disposal facility or facilities including the following:

a. General Information

1) Facility Name

2) Facility Address

3) Name and Title of Contact Person

4) Telephone Number of Contact Person

5) Permit Number

b. The facility shall specify the volume of material that can be accepted from the Project on a weekly and a total basis.

c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified contaminated materials the general quality and quantity described by these specifications.

d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and treatment/disposal of the contaminated materials described by these specifications.

2. Connecticut Department of Transportation Transporter Identification Number and expiration date.

3. Name and address of all hazardous material transporters to be used to transport materials including proof of permit, license, or authorization to transport hazardous material in all affected states.

B. Upon receipt of final approval from treatment/disposal facility to accept contaminated materials, submit copy of said approval.

C. Within 10 working days after the off-site transportation of contaminated materials, submit copies of all paperwork related to transportation of contaminated materials. Such paperwork may include, but not be limited to receipts, weight tickets, and disposal certificates.

1. Provide certified tare and gross weight slips for each load received at the designated treatment/disposal facility which shall be attached to copy of related manifest or bill of lading.

D. Prior to receiving progress payment, submit documentation certifying that all materials were transported to, accepted, and disposed of, at the selected treatment/disposal facility. The documentation shall include the following, as a minimum.

1. Documentation for each load from the site to the disposal facility, including all manifests and any other applicable transfer documentation.

2. All documentation for each load shall be tracked by the original manifest or bill of lading document number assigned at the project site at time of signature by authorized Engineer.

1.4 REGULATORY REQUIREMENTS

A. Obtain all Federal, State and local permits, approvals, or authorizations required for the transport and disposal of contaminated materials. Adhere to all requirements of such permits, approvals, or authorizations.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 GENERAL

A. Sample, test, or analyze contaminated material for approval of final disposal.

B. Contaminated materials to be disposed of include, but are not limited to

1. Asbestos-containing building materials
2. Assumed PCB containing building materials
3. Lead-containing painted materials
4. Other materials from abatement and decontamination operations

C. All contaminated materials abated, consolidated, or otherwise managed during the course of the Work will require special handling in accordance with these specifications, the Contractor's Health and Safety Plan (HASP), and all applicable permits, approvals, authorizations, and regulations.

D. Dispose of contaminated materials at facilities acceptable to Owner or Engineer.

E. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the site specific HASP.

F. Contractor shall select treatment/disposal facilities to receive contaminated materials from the Project which are established, fully operational, and in full compliance with all applicable Federal, State, and local regulations.

G. Perform collection of characterization samples and laboratory analyses to satisfy the acceptance criteria for selected receiving facility(s).

H. Remove all contaminated materials from the project site and legally dispose of materials.

3.2 DISPOSAL COORDINATION AND TRANSPORT

A. Contractor is solely responsible for coordinating treatment/disposal facility approval, scheduling, loading, transport, and ultimate disposal of contaminated materials at treatment/disposal facility. No claim for delay will be considered based upon Contractor's facility or hauling company failing to meet Contractor's production schedule. No payments will be made for rejected loads.

3.3 MANIFESTS AND SHIPPING PAPERS

A. Owner is designated as the "Generator" and will sign all Manifests and Shipping Papers. Manifests and Shipping Papers shall be prepared by Contractor seventy-two (72) hours in advance of shipment of contaminated materials. Authorized Owner's representative will sign as "Generator" for each load of contaminated material that leaves the Project Site. Contractor shall forward appropriate original copies of Manifests or Bills of Lading to Engineer on the same day the contaminated materials leave the Project Site.

3.4 TRANSPORT OF CONTAMINATED MATERIAL

A. Transport contaminated materials off-site after all treatment/disposal facility documentation has been completed and the material accepted by said facility.

B. Transport contaminated materials from the site to treatment/disposal facility in accordance with all United States Department of Transportation (DOT), USEPA, Connecticut regulations and other regulations of all affected states.

C. The Hauler(s) shall be licensed in all states affected by transport.

D. Provide to Engineer copies of all weight slips, both tare and gross, for every load weighed and disposed of at the accepted disposal facility. The slips shall be tracked by the original manifest document number that was assigned by Engineer at the site. Owner will only make progress payments upon receipt of these weight slips.

E. Minimize the potential for development of free liquid during transport. Do not load wet materials for transport. If free liquid does develop during transport, Contractor shall be responsible for proper collection and disposal of same.

END OF SECTION

SECTION 13281

ASBESTOS ABATEMENT

PART 1- GENERAL

1.1 GENERAL PROVISIONS

A. The University of Connecticut (the "Owner") plans an extensive renovation of the Gant Science Complex on the main campus in Storrs, CT. Phase Zero of the renovations include investigation and preconstruction Mock-ups. The investigations include multiple locations of substrate penetrations and exploratory demolition. Asbestos containing material (ACM) testing has identified building materials that contain asbestos (or assumed asbestos-containing materials) and require removal prior to or during the investigations/mockups. The work covered in this section includes the minimum procedures that shall be employed during abatement of the ACM.

B. Refer to other Sections of these Specifications to determine the type and extent of work therein affecting the work of this Section, whether or not such work is specifically mentioned herein.

1.2 SUMMARY

A. Related Sections

1. Section 01350, Health & Safety Plan
2. Section 02120, Transportation and Disposal of Contaminated Materials
3. Section 13282, Lead Paint Awareness
4. Section 13286, Assumed PCB Contaminated Building Materials Abatement

B. Related Documents

1. Refer to Addendum 3, Phase Zero Drawings provided by Goody Clancy, dated September 28, 2016.

1.3 PROJECT DESCRIPTION

A. The work to be performed includes but is not limited to the proper removal, handling, and disposal of all ACM proposed to be disturbed during the Phase Zero investigations/mockups at the Gant Science Complex located on the main University of Connecticut campus in Storrs, CT. A detailed description of the materials and general locations of ACM scheduled for removal at the Gant Science Complex for Phase Zero of the renovation project are shown below on Table 1: Base Bid Scope of Work.

B. Certain ACM also contain assumed PCB's. It is incumbent upon the Abatement Contractor ("Contractor") to review the requirements of Section 13286 and comply with any additional requirements of these sections.

C. Base Bid asbestos removal work shall consist of the removal of materials that are confirmed and/or assumed to be present within the building and on the building exterior.

D. Base Bid asbestos abatement work shall include but not be limited to the following ACM. The

quantities given below are provided to establish the order of magnitude of the abatement project. Actual quantities may vary. It is the sole responsibility of the Contractor to visit the site, review the Contract Documents and determine the quantities of ACM to be removed when developing their Bid. Location, estimated quantities, and abatement phasing plan of specific items noted in paragraph A above include:

TABLE I: BASE BID SCOPE OF WORK

LOCATION(S)	MATERIAL TYPE	QUANTITY
South Elevation – 2nd Floor – North Elevation**	Window Glazing Compound*	2 Window Sets = 80 SF
ASSUMED ASBESTOS CONTAINING MATERIALS		
Plaza West Portion and Walkway	Roof Field and Flashing	2 Locations @ 2' x 2' each = 8 SF
West and South Tower Roofs	Assumed Suspect Roofing Material(s) under EPDM	5 Locations @ 2' x 2' each = 20 SF
Plaza Walkways	Assumed Suspect Plaza Substrate Material(s) under Stone Pavers	3 Locations @ 2' x 2' each = 12 SF
West Elevation (West Tower) – 3rd Floor** South Elevation (South Tower) – Ground Floor** North Elevation (South Tower) – 2nd Floor & Elevator Machine Rooms** East Elevation (South Tower) – 4th Floor** West Tower - 1st and 2nd Floors**	Assumed Suspect Wall Cavity Material(s) behind CMU	20 Locations with two 8"x16" CMU blocks = <40 SF
South Elevation – 2nd Floor**	Window Felt/Tar (Behind Brick)	2 Window Sets = 56 SF

Notes: * Material is asbestos-containing and assumed to contain PCBs (≥50 ppm).

** Exact locations may be adjusted by the Owner but are used from the September 28, 2016 Goody Clancy Phase Zero Drawings Set.

E. The Contractor shall coordinate the work of the Asbestos Abatement Section with that of the work of the Construction Manager (CM). It is the Contractor's responsibility to become familiar with the CM's construction phasing plan for the project and to include the required remobilization fees to support the phasing.

F. The Contractor is directed to review the overall project schedule to assist them in developing their bid.

1.4 QUALITY ASSURANCE

A. The Contractor shall be a State of Connecticut licensed Asbestos Contractor with a current license.

B. The Asbestos Abatement Supervisor(s) and Asbestos Abatement Workers shall be accredited in accordance with EPA regulation 40 CFR Part 763, subpart E, Appendix C; and shall be licensed by the State of Connecticut Department of Public Health as Supervisors or Workers in accordance with EPA accreditations.

1.5 APPLICABLE CODES

A. The Contractor shall be solely responsible for conducting this project and supervising all work in a manner that will be in conformance with all federal, state and local regulations and guidelines pertaining to asbestos abatement. Specifically, the Contractor shall comply with the requirements of the following:

1. EPA AHERA Regulation (40 CFR 763 Final Rule and Notice);
2. EPA NESHAP Regulations (40 CFR 61, Subpart M);
3. OSHA Asbestos Regulations (29 CFR 1910.1001 and 1926.1101);
4. Connecticut DEEP Regulations (Section 22a-209-8 (I) and Section 22a-220 of the Connecticut General Statutes);
5. Connecticut DPH Standards for Asbestos Abatement Sections 19a-332a-1 to 19a-332a-16;
6. Connecticut DPH Licensure and Training Requirements Section 20-440-1 to Section 20-440-9.
8. Connecticut Basic Building Code (BOCA);
8. Connecticut Fire Safety Code (NFPA);
9. Local health and safety codes, ordinances or regulations pertaining to asbestos remediation and all national codes and standards including ASTM, ANSI, and Underwriter's Laboratories.

1.6 EXEMPTIONS

A. This project was designed by a licensed State of Connecticut Department of Public Health Asbestos Abatement Designer, James Webb (License # 000297). Any deviation from these specifications requires the written approval and authorization from the Designer.

B. Any deviations from CTDPH Standards for Asbestos Abatement Sections 19a-332a-1 through 19a-332a-16 must be requested in writing and must be approved in writing by CTDPH.

1.7 NOTIFICATIONS, POSTINGS AND PERMITS

A. The Contractor shall make the following notifications and provide the submittals to the following agencies prior to the commencement of removal work. <u>This notification is required 10 calendar days prior to the start of the abatement project</u>:

1. State of Connecticut
   Department of Public Health
   Indoor Air Program
   410 Capitol Avenue
   P.O. Box 340308
   Hartford, CT 06134-0308

<u>Note:</u> Satisfies the requirement to notify the EPA (except when the amount of ACM to be abated is less than 10 linear/25 square feet or when the work involves demolition with zero asbestos. EPA needs to be notified directly in those situations).

B. The minimum information included in the notification includes:

1. Name and address of building owner/operator
2. Building location
3. Building size, age, and use
4. Amount of friable and non-friable asbestos
5. Work schedule, including proposed start and completion date
6. Asbestos removal procedures to be used
7. Name and location of disposal site for generated asbestos waste, residue, and debris

C. 10 day notifications shall be posted for each individual phase of the project.

1.8 WORK SITE SAFETY PLAN

A. The Contractor shall establish a set of emergency procedures and shall post them in a conspicuous place at the work site. The safety plan should include provisions for the following:

1. Evacuation of injured workers.
2. Emergency and fire exit routes from all work areas.
3. Emergency first aid treatment.
4. Local telephone numbers for emergency services including ambulance, fire, and police.
5. A method to notify workers in the event of a fire or other emergency requiring evacuation of the building.
6. Confined space entry program.
7. 4 hour site security program.

B. The Contactor is responsible for training all workers in these procedures.

1.9 ALTERNATIVE WORK PRACTICES (AWP)

A. Any deviations from these specifications require the written approval and authorization from the Owner and consultant.

B. Any deviations from CTDPH Standards for Asbestos Abatement Sections 19a-332a-1 through 19a-332a-16 must be requested in writing and must be approved in writing by CTDPH.

1.10 RE-OCCUPANCY CLEARANCE

A. The Owner shall be responsible for payment of the sampling and analysis of initial re-occupancy air samples only. The Contractor shall be responsible for payment of all costs associated with the collection and analysis of additional re-occupancy air samples for areas that failed the initial test. This shall also include the laboratory charges for preparation of slides for samples that are "overloaded" and become unreadable.

B. Phase Contrast Microscopy (PCM) air samples will be analyzed by Tighe & Bond.

1.11 CONTROL OVER REMOVAL WORK

A. All Contractor work procedures shall be monitored by the Contractor's "Competent Person" to ensure that areas outside the designated work locations do not become contaminated. The following controls shall be implemented each working day to help ensure this:

1. Prior to work on any given day, the Contractor's designated "Competent Person" shall evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination enclosure systems.

B. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:

1. Nonessential personnel are prohibited from entering the area;
2. All authorized personnel entering the work area shall sign the work area entry log;
3. All authorized personnel entering the work area shall read the "worker protection procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing;
4. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated;
5. Asbestos waste that is taken out of the work area must be properly bagged and labeled in accordance with these specifications. The surface of the bags shall be decontaminated. Asbestos waste leaving the enclosure system must be transported off site or immediately placed in locked, posted temporary storage on site, and be removed within 24 hours of the project conclusion.
6. Any material, equipment, or supplies that are brought out of the decontamination enclosure system shall be cleaned and decontaminated by wet cleaning and/or HEPA vacuuming of all surfaces.

1.12 SITE SECURITY

A. The Contactor shall be responsible for the security of regulated areas. Post asbestos abatement warning signs at entrances to the work area including the waste load out and worker decontamination chamber. The Contractor shall have an supervisor monitoring the entrance of the worker decontamination chamber during abatement work.

1.13 PERSONNEL PROTECTION

A. Prior to commencing work, instruct all workers in all aspects of personnel protection, work procedures, emergency procedures use of equipment including procedures unique to this project.

B. Respiratory protection shall meet the requirements of OSHA as required in 29 CFR 1910.134, 29 CFR 1926.11, 29 CFR 1926.62 and the requirements of the CTDPH Standards for Asbestos Abatement (19a-332a-1 through 16). A formal respiratory protection program must be implemented in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall conduct exposure assessment air sampling, analysis and reporting to ensure the workers are using appropriate respiratory protection.

C. The Contractor shall provide appropriate respiratory protection for each worker and ensure usage during potential asbestos exposure.

D. The Contractor shall provide respirators from among those approved as being acceptable for protection by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part II.

E. The Contractor shall provide an adequate supply of filter for respirators in use.

F. Minimum respiratory protection shall be as follows:

Air borne Asbestos Level:	Required Respirator:
Not in excess of 1 f/cc (10 x PEL)	Half mask air purifying or otherwise as required respirator other than a disposable respirator, equipped with HEPA P 100 filters.
Not in excess of 5 f/cc (50 x PEL)	Full facepiece air purifying respirator equipped with HEPA P 100 filters.
Not in excess of 100 f/cc (1,000 x PEL)	Tight-fitting powered air purifying respirator equipped with HEPA P 100 filters or any supplied air respirator operated in continuous flow mode.
Not in excess of 100 f/cc (1,000 x PEL)	Full facepiece supplied air respirator operated in pressure demand mode.
Greater than 1,000 f/cc (10,000 x PEL)	Full facepiece supplied air respirator unknown operated in pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus.

Note:

1. Respirators assigned for higher airborne fiber concentrations may be used at lower concentrations.
2. A high efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.
3. In addition to the selection criteria in paragraph 1.13F, the Contractor shall provide a tight-fitting powered air purifying respirator equipped with high efficiency filters or a full facepiece supplied air respirator operated in the pressure demand mode equipped with HEPA egress cartridges or an auxiliary positive pressure self- contained breathing apparatus for all employees within the regulated area where Class I work is being performed for which a negative exposure assessment has not been produced and the exposure assessment indicates the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions if the exposure assessment indicates exposure levels above 1 f/cc as an 8 hour time weighted average.
4. If compresses air is used for supplied air respirators, this air will meet the requirements for grade D breathing air as described by the Compresses Gas association commodity Specification G-7.1-1966. The compressor will be equipped with the necessary safety devices and sorbends/filters, and be situated to avoid entry of contaminated air. In addition, the compressor will be equipped with alarms to indicate failure or overheating, and

additional alarms for indicating the presence of carbon monoxide. Air line couplings will be incompatible with outlets for other gas system to prevent inadvertent servicing of airline respirators with non-respirable gases.

G. The Contractor shall provide and require all workers to wear protective clothing in Work Areas where asbestos fiber concentration exceed permissible limits established by the OSHA or where contamination exists. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.

H. The Contractor shall ensure that all authorized persons entering contaminated areas are equipped with proper respirators and protective clothing.

1.14 WORKER PROTECTION PROCEDURES

A. The Contractor shall monitor airborne asbestos concentrations in the workers' breathing zone to establish conditions and work procedures for maintaining compliance with OSHA Regulations 29 CFR 1910.1001 and 29 CFR 1926.1101.

B. The Contractor's air sampling professional shall document all air sampling results and provide all air sampling reports as soon as feasible. OSHA air monitoring results shall be posted at a conspicuous location at the job site.

C. All personnel air sampling shall be conducted in accordance with methods described in OSHA standards 29 CFR 1910.1001 and 29 CFR 1926.1101.

D. The Contractor is responsible for complying with all additional OSHA regulations while performing work on this project.

1.15 SUBMITTALS

A. The Contractor will submit two copies of the following submittals to the Owner's Representative 10 calendar days prior to the commencement of removal work:

1. Contractor's construction schedule.
2. Shop drawings showing work area configuration with decontamination facility and negative air exhaust locations.
3. Waste generator label to be used.
4. Waste shipment and disposal form to be used with generated information.
5. Waste hauling contractor.
6. Landfill to be used.
7. Asbestos abatement training certificates, licenses, respirator fit-test records and medical records of each employee who may be on the project site.
8. The qualifications of the hygiene firm that the Contractor proposes to use for this project to analyze Contractor employee OSHA monitoring samples.
9. Copies of all notifications and permits.
10. Copies of the written respirator plan compliant with the most current issue of OSHA 29 CFR 1910.134.
11. Copies of all MSDS sheets for materials to be used on site.
12. Work Site Safety Plan.
13. Negative Exposure Assessment.

14. Contractor's State of Connecticut Asbestos Contractor license.
15. State Notification of Asbestos Abatement.

B. The Contractor will submit the following to the Consultant during the work:

1. Results of all personal air sampling.
2. Certificate, training, medical, and fit-test records for new employees to start work (24 hours in advance of work).
3. Signed copy of the Certificate of Workers Acknowledgment found at the end of this section for each worker who will be at job site.
4. Contractor site logs and containment access logs.
5. Revised Notification, if any.
6. Copies of Waste Shipment Records (WSR) for waste that leaves the site.

C. The following shall be submitted to the Consultant within forty-five days of the completion of work:

1. Completed copies of WSRs.
2. Remaining personal air sampling results and site logs.
3. Revised Notification, if any.

1.16 DEFINITIONS

A. ABATEMENT - Procedures to control fiber release from asbestos-containing materials; includes removal, encapsulation, and enclosure.

B. AIRLOCK - A system for permitting ingress and egress while assuring air movement to a contaminated area from an uncontaminated area. Two curtained doorways spaced a minimum of six feet apart can form an airlock.

C. AIR MONITORING - The process of measuring the fiber concentration of an area or of a person.

D. ADEQUATELY WETTED - Sufficiently mixed or coated with water, amended or an aqueous solution; or the use of removal encapsulant to prevent dust emissions.

E. AMENDED WATER - Water to which a surfactant has been added.

F. ASBESTOS - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms that have been chemically altered.

G. ASBESTOS ABATEMENT - The removal, encapsulation, enclosure, renovation, or repair of asbestos-containing materials.

H. ASBESTOS ABATEMENT SITE SUPERVISOR - Any licensed individual who is employed or engaged by a Contractor to supervise an asbestos abatement project.

I. ASBESTOS ABATEMENT WORKER - Any employee of a Contractor who engages in asbestos abatement.

J. ASBESTOS CONSULTANT - Any person who engages in any activity directly involved with asbestos consultation services and who has been issued a certificate by the

commissioner and a license by the department.

K. ASBESTOS CONTAINING MATERIAL (ACM) - A material composed of asbestos of any type and in an amount greater than one percent be weight, either alone or mixed with other fibrous or non-fibrous material.

L. ASBESTOS CONTRACTOR - Any person or entity engaged in asbestos abatement whose employees actually perform asbestos abatement work and is licensed by the State of Connecticut Department of Public Health.

M. ASBESTOS CONTROL AREA - An area where asbestos abatement operations are performed which is isolated by physical boundaries to prevent the spread of asbestos dust, fibers, or debris.

N. ASBESTOS FIBERS - Those particles with a length greater than five (5) microns and a length to diameter ratio of 3:1 or greater.

O. ASBESTOS PERMISSIBLE EXPOSURE LIMIT (PEL) - The maximum airborne concentration of asbestos fibers to which an employee is allowed to be exposed. The current level established by OSHA is 0.1 fibers per cubic centimeter of air as an eight (8) hour time weighted average and 1.0 fibers/cc averaged over a sampling period of 30 minutes as an excursion limit. The Contractor is responsible for maintaining work areas in a manner that this standard is not exceeded.

P. ASBESTOS PROJECT MONITOR - The State of Connecticut licensed asbestos consultant who is certified as a project monitor and who functions as an on-site representative of the facility Owner or other persons by over-seeing the activities of the asbestos abatement contractor.

Q. AUTHORIZED VISITOR - Any person authorized by the Owner to enter the building.

R. BUILDING OWNER - For this Contract only, the building Owner is University of Connecticut.

S. CLEAN ROOM - An uncontaminated area or room, which is a part of the workers' decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.

T. CLEARANCE SAMPLING OR RE-OCCUPANCY AIR MONITORING - Final air sampling performed aggressively after the completion of the abatement project in a regulated area. Five (5) air samples collected by the asbestos abatement project monitor inside the work area, and having a fiber concentration of less than 0.010 fibers/cc of air will denote acceptable clearance sampling by Phase Contrast Microscopy (PCM). Five air samples collected by the asbestos abatement project monitor having an average asbestos concentration of less than 70 asbestos structures mm/sq. will denote acceptable clearance sampling for Transmission Electron Microscopy (TEM).

U. COMMISSIONER - The Commissioner of the Connecticut Department of Health Services or his/her authorized agent.

V. COMPETENT PERSON - A representative of the Contractor who is capable of identifying an asbestos hazard and who has the authority to take prompt corrective measures to eliminate the hazard during asbestos removal.

W. CONFINED SPACE - A work zone where access and egress are restricted, a potential for gaseous vapors to accumulate exist, or a potential for low oxygen content exists.

X. DECONTAMINATION ENCLOSURE SYSTEM - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.

Y. DEPARTMENT - The Department of Public Health.

Z. EPA – U.S. Environmental Protection Agency.

AA. ENCAPSULANT - A liquid material that can be applied to asbestos-containing material that controls the possible release of asbestos fibers from the materials by either creating a membrane over the surface (bridging encapsulant) or penetrating the material and binding its components together (penetrating encapsulant).

BB. ENCAPSULATION - A specified asbestos remediation strategy involving the application of an encapsulant to asbestos containing materials to control the release of asbestos fibers into the air.

CC. CEQUIPMENT DECONTAMINATION ENCLOSURE - That portion of a decontamination enclosure system designed for controlling the transfer of materials and equipment, typically consisting of a washroom and a holding area.

DD. EQUIPMENT ROOM - A contaminated area or a room, which is part of the workers' decontamination enclosure with, provisions for storage of contaminated clothing and equipment.

EE. FACILITY - Any private or public building or structure including but not limited to those used for institutional, residential (including single family homes), commercial or industrial purposes and vessels while ashore or in dry-dock.

FF. FIXED OBJECT - A unit of equipment or furniture in the work areas which cannot be removed from the work area.

GG. FRIABLE ASBESTOS MATERIAL - Any material that contains more than 1% asbestos by weight, that can be crumbled, pulverized or reduced to powder by hand pressure.

HH. GLOVE BAG - An impervious plastic bag-like enclosure affixed around asbestos containing material, with glove-like appendages through which materials and tools may be handled.

II. HAZARDOUS WASTE MANIFEST - a form required by EPA and the Department of Transportation for all generators who transport, or offer for transport, hazardous waste for off-site treatment, recycling, storage or disposal.

JJ. HEPA FILTER - A high efficiency particulate air (HEPA) filter in compliance with ANSI Z9.2-1979.

KK. HEPA VACUUM EQUIPMENT - Vacuum equipment with a HEPA filter system for filtering the effluent air from the unit.

LL. HOLDING AREA - An air-locked chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.

MM. INSPECTOR (ASBESTOS ABATEMENT PROJECT MONITOR)- An individual, retained by the Building Owner, who is a "licensed asbestos abatement project monitor" as defined by the State of Connecticut Department of Public Health, and who will be

responsible for monitoring the Contractor during the asbestos abatement project.

NN. MOVABLE OBJECT - A unit of equipment or furniture in the work area, which can be removed from the work area.

OO. NEGATIVE AIR FILTRATION EQUIPMENT - A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.

PP. OWNER'S REPRESENTATIVE -The Asbestos Consultant for the project.

QQ. NESHAP - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA (40 CFR 61, Subpart M).

RR. PLASTICIZE - To cover floors and walls with plastic sheeting as specified herein.

SS. SEPARATION BARRIER - A rigid barrier sealed with two (2) layers of six (6) mil polyethylene sheeting installed between an occupied area and the asbestos abatement work area.

TT. SHOWER ROOM - A room between the clean room and the equipment room in the workers' decontamination enclosure with hot/cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.

UU. STRIPPING - Removing asbestos materials from any structural member, pipe surface, HVAC, or other equipment.

VV. WASHROOM - A room between the work area and the holding area in the equipment decontamination enclosure with provisions for storage of contaminated clothing and equipment.

WW. WASTE SHIPMENT RECORD – the shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

XX. WET CLEANING - The process of reducing asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools, which have been dampened by amended water, and by then disposing of these cleaning items as asbestos contaminated waste.

YY. WORK AREA - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are occurring and which may become contaminated as a result of such abatement actions. The work area must be totally self-contained by sealing, plasticizing and equipping the area with a decontamination enclosure system.

ZZ. WORKER DECONTAMINATION ENCLOSURE SYSTEM - That portion of a decontamination enclosure system designated for controlled passage of workers, other personnel, and authorized visitors, typically consisting of a clean room, a shower room, and an equipment room.

AAA. WORK STOPPAGE CLEANUP PROCEDURE - A process following the issuance of a written stop work order, whereby the Contractor thoroughly cleans and decontaminates the work area, the decontamination enclosure system, and any other areas of the building affected by the removal project, to the satisfaction of the Asbestos Project Monitor.

BBB. WORK ZONE - The area of the decontamination enclosure system where asbestos is being removed.

1.17 PRECONSTRUCTION MEETING

A. The Contractor shall be required to attend a preconstruction meeting with his site supervisor, project manager and any sub-contractor they employ on site for the purpose of reviewing the contract requirements.

PART 2 - MATERIALS AND EQUIPMENT

2.1 MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed of as asbestos waste.

C. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating four or six mil.

D. Polyethylene disposable bags shall be true six mil with preprinted labels.

E. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets 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.

F. Surfactant (wetting agent) - shall consist of 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to five gallons of water or as directed by manufacturer.

G. Impermeable containers are to be used to receive and retain any asbestos-containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with OSHA Standard 29 CFR 1926.1101.) Containers must be both air and watertight.

H. Labels and signs, as required by OSHA Standard 29 CFR 1926.1101 will be used.

I. Encapsulant shall be bridging or penetrating type which has been found acceptable to Tighe and Bond. Usage shall be in accordance with manufacturer’s printed technical data.

J. Disposal labels shall be preprinted on self-adhesive labels with the generator name, abatement site and contractor's name and address. Labels shall not be photocopied and applied with spray adhesive.

2.2 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos removal, encapsulation and enclosure.

B. The Contractor Personnel exposure surveillance per OSHA requirements.

C. The Contractor shall have available sufficient inventory on site for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape, and air filters.

D. The Contractor shall provide temporary electrical power sources such as generators (when required).

E. The Contractor shall have available shower stalls and sufficient hose length and a drain system equipped with 5-micron filters.

F. Exhaust air filtration system units shall contain HEPA filter(s) capable of sufficient air exhaust to create negative pressure of 0.02 inches of water within the enclosure with respect to the outside area. Equipment shall be checked for proper operation by smoke tubes or a differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of four air changes per hour within the enclosure. No air movement system or air filtering equipment shall discharge unfiltered air outside.

G. Vacuum units, of suitable size and capacities for project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers in diameter or larger.

H. The Contractor will have reserve exhaust air filtration system units in order to maintain negative air filtration in the event that a unit malfunctions during use.

I. The Contractor shall have available and use recording manometers to monitor pressure differential between the work area and occupied areas of the building. A minimum negative pressure differential of 0.02 inches of water column shall be maintained.

J. The Contractor shall have available spray equipment capable of mixing a wetting agent with water and capable of generating sufficient pressure and volume and having sufficient hose length to reach all areas with asbestos.

K. HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports where asbestos-containing materials may be disturbed.

PART 3 - EXECUTION

3.1 INTERIOR WORK AREA PREPARATION - GENERAL

A. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All temporary installations are to be made by a licensed electrician, installed outside work areas, and permitted as required.

B. Shut down electrical power, including receptacles and light fixtures. Lock and tag out circuits associated with the electrical components in the work area(s). Under no circumstances during the abatement and ceiling demolition procedures will lighting fixtures be permitted to be energized.

C. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. Lock and tag out circuits associated with heating and cooling units. During the work, vents within the work area shall be sealed with duct tape and polyethylene sheeting.

D. Seal off all openings, including but not limited to windows, corridors, doorways, skylights,

ducts, grills, diffuser, and any other penetration of the work areas, with polyethylene sheeting minimum of six mil thick sealed with duct tape. This includes doorways and corridors which will not be used for passage during work areas and occupied areas. Install five micron water filtration socks in all floor drains prior to sealing.

E. Where friable asbestos containing materials are present, establish worker decontamination facility, critical barriers and negative air filtration prior to conducting pre-cleaning activities. Pre-clean fixed objects within the work areas, using HEPA vacuum equipment and/or wet cleaning methods as appropriate, and enclose with minimum six mil plastic sheeting sealed with duct tape.

F. Pre-clean movable objects within the work areas, using HEPA vacuum equipment and 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.

G. After HEPA vacuum pre-cleaning, conduct work area preparation in accordance with this Specification section.

H. Where fixed walls are not used, one layer of six mil polyethylene sheeting will be applied to a rigid framework of wood, metal, or PVC.

I. Install two layers of four mil polyethylene wall sheeting over all wall surfaces and critical barrier (where wall materials are not being removed as ACM). All overlaps shall be sealed with tape or spray adhesive.

J. Cover all floors in the work area with two layers of six mil polyethylene sheeting (where flooring materials are not being removed as ACM). Extend the polyethylene flooring a minimum of 12 inches up the walls. Ensure that the wall sheeting overlaps the floor sheeting from the top.

K. Where containments extend above suspended or fixed ceilings, remove ceiling as necessary to perform installation of isolation barriers and wall sheeting above ceiling. Wall sheeting shall extend to the top of each wall in ceiling plenum areas.

L. Maintain emergency and fire exits from the work area, or establish alternative exits satisfactory to fire officials.

M. Create pressure differential between work areas and occupied areas by the use of acceptable negative air pressure equipment. The Contractor shall ensure required negative air pressure is obtained throughout the containment and the total volume of air within the work area is changed every 15 minutes.

N. Install a manometer within each work area where Class I work will be performed to monitor the negative pressure within the work area.

O. Post all approaches to each work area with Asbestos Warning signs. Warning signs shall be of size and type that are easily readable and are visible from all approaches to the work areas.

P. Establish a work area access control log at the entrance to each work area. Authorized personnel entering the work area shall sign in upon entering the area and sign out upon exiting the area.

Q. Establish airless spray equipment within each work area. Airless spray equipment shall be capable of reaching all areas within each work area.

3.2 CONTIGUOUS PERSONNEL DECONTAMINATION SYSTEM

A. The Contractor shall establish contiguous to each work area, where feasible, a personnel decontamination system consisting of equipment room, shower room and clean room in series. Access between the contaminated and uncontaminated areas shall be through this decontamination enclosure only. The decontamination system shall be constructed of two layers of six-mil polyethylene sheeting. Pre-fabricated "pop-up" decontamination chambers will not be permitted on this project.

B. Access between rooms in decontamination system shall be through double flap-curtained openings. Clean room, shower room and equipment room within decontamination system shall be completely sealed ensuring that the sole source of air flow through this area originates from uncontaminated areas outside the work area.

C. The shower unit shall be equipped with an adequate supply of warm water. A shower filtration pump containing two 5 micron sock filters or the best available technology shall be installed to filter shower water. Filtered shower water shall be discharged into sanitation drains and shall not be discharged into storm drains or onto floor or ground surfaces.

D. The shower room shall have soap and an adequate supply of drying towels. Provide an adequate number of shower units in accordance with OSHA 29 CFR 1926.1101.

3.3 REMOTE PERSONNEL DECONTAMINATION SYSTEM

A. The Contractor shall establish a remote personnel decontamination system where contiguous decontamination systems are not feasible. The use of a remote decontamination unit must be indicated on the State Notification of Asbestos Abatement. Access between the contaminated and uncontaminated areas shall be through this decontamination enclosure only. The decontamination system shall be constructed of two layers of six-mil polyethylene sheeting. Pre-fabricated "pop-up" decontamination chambers will not be permitted on this project.

B. Access between rooms in decontamination system shall be through double flap-curtained openings. Clean room, shower room and equipment room within decontamination system shall be completely sealed ensuring that the sole source of air flow through this area originates from uncontaminated areas outside the work area.

C. The shower unit shall be equipped with an adequate supply of warm water. A shower filtration pump containing two 5 micron sock filters or the best available technology shall be installed to filter shower water. Filtered shower water shall be discharged into sanitation drains and shall not be discharged into storm drains or onto floor or ground surfaces.

D. The shower room shall have soap and an adequate supply of drying towels. Provide an adequate number of shower units in accordance with OSHA 29 CFR 1926.1101.

3.4 WASTE LOAD OUT SYSTEMS

A. The Contractor shall establish waste load out systems, where feasible, attached to the work areas. Waste load out systems shall consist of a minimum of two chambers that are of suitable size for transporting waste out of the work area. Waste load out systems shall be constructed of two layers of six-mil polyethylene sheeting.

B. Access between rooms in the waste load out system shall be through double flap-curtained openings. The waste load out system shall be used for decontaminating waste containers, bags, bundles, etc. prior to removal from the work area and transporting waste from the work area to the non-work area.

C. Persons working inside the contaminated work area are not permitted to pass from the work area to the non-work area through the waste load out system. Persons inside the contaminated work area shall not be permitted to enter into the clean area of the waste load out system.

D. The waste load out system shall remain sealed at all times except during decontamination of waste containers and transport of waste from the work area to the non-work area.

3.5 WORK AREA EXHAUST

A. Install sufficient quantity of portable HEPA-filtered exhausts to maintain each interior work area, including the Decontamination Facility, under negative pressure, and to reduce airborne asbestos fiber concentrations.

B. The exhaust(s) must be capable of providing at least an inward velocity through any unsealed openings, including the decontamination Facility, of at least 100 fpm, and four full air changes per our throughout the work area.

C. All exhaust air shall pass through a HEPA filter before being discharged to the exterior of the building.

D. Deficient air flows shall be immediately reported and work ceased until the situation is corrected.

E. Exhaust system shall be operated constantly from the time that preparation is completed, until "clean air" certification is obtained.

3.6 APPROVAL OF CONTAINMENT AREAS

A. After the work area has been prepared as specified, request and inspection by the Consultant. No removal or disturbance of asbestos-contaminated materials or systems is to occur until the Consultant has inspected and approved each separate prepared work area.

B. Any deficiencies in the preparation work shall be promptly corrected in a manner satisfactory to the Consultant.

3.7 INTERIOR WORK AREA PREPARATION

A. The phases and hours of for this asbestos abatement project shall be coordinated with the Owner.

B. The Contractor shall provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All temporary installations are to be made by a licensed electrician.

C. Shut down electrical power, including receptacles and light fixtures. Lock and tag out circuits associated with the electrical components in the work area(s). Under no

circumstances during the abatement and ceiling demolition procedures will lighting fixtures be permitted to be energized.

D. Shut down and/or isolate heating, cooling, and ventilation air systems or zones to prevent contamination and fiber dispersal to other areas of the structure. Lock and tag out circuits associated with heating and cooling units. During the work, vents within the work area shall be sealed with duct tape and polyethylene sheeting.

E. Seal off all openings, including but not limited to windows, corridors, doorways, skylights, ducts, grills, diffuser, and any other penetration of the work areas, with one layer of six mils thick polyethylene sheeting sealed with duct tape as "critical barrier" (except the windows where the window gazing compound shall be removed. These windows shall be sealed from outside the building). This includes doorways which will not be used for passage during work areas and occupied areas. Install 5 micron water filtration socks in all floor drains prior to sealing.

F. Perform selective demolition of the ceiling and wall surfaces to uncover hidden ACM items as required.

G. Pre-clean movable objects within the work areas, using HEPA vacuum equipment and 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. Where friable ACM are present, establish worker decontamination facility, critical barriers and negative air filtration prior to conducting pre-cleaning activities.

H. After HEPA vacuum pre-cleaning, conduct work area preparation in accordance with this Specification section.

I. Install two layers of four mil polyethylene wall sheeting over all wall surfaces and critical barrier (except where wall wood panels are being removed as ACM). All overlaps shall be sealed with tape or spray adhesive. Where fixed walls are not used, one layer of six mil polyethylene sheeting will be applied to a rigid framework of wood, metal, or PVC.

J. Cover all floors in the work area with two layers of six (6)-mil polyethylene sheeting (except where flooring materials are being removed as ACM). Extend the polyethylene flooring a minimum of 12 inches up the walls. Ensure that the wall sheeting overlaps the floor sheeting from the top.

K. Maintain emergency and fire exits from the work area, or establish alternative exits satisfactory to fire officials.

L. Create pressure differential between work areas and occupied areas by the use of acceptable negative air pressure equipment. The contractor shall ensure required negative air pressure is obtained throughout the containment and the total volume of air within the work area is changed every 15 minutes.

M. Post all approaches to each work area with Asbestos Warning signs. Warning signs shall be of size and type that are easily readable and are visible from all approaches to the work areas.

N. Establish a contiguous worker decontamination chamber per SECTION 3.2 DECONTAMINATION FACILITY. Post asbestos abatement warning signs in accordance with OSHA 29 CFR 1926.1101.

O. The Contractor shall have a designated “Competent Person” on the job at all times to ensure proper work practices throughout the project.

3.8 EXTERIOR WORK AREA PREPARATION

A. Where exterior non-friable ACM is to be removed outdoors, post asbestos abatement warning signs and erect temporary barricades to create regulated areas. Regulated areas should be kept clear of any persons not fully trained and protected against exposure.

B. Where exterior friable ACM is to be removed, follow requirements of Section 3.7 INTERIOR WORK AREA PREPARATION.

C. Install single six mil drop cloths extending a minimum of 10 feet from the exterior wall of the building. Extend polyethylene sheeting outward from the base of the structure in order to collect debris when working from higher elevations. Install single six mil critical barriers over any louver, vent or penetration into the building interior within or directly adjacent to the regulated area.

D. Maintain an operable remote worker decontamination system in accordance with Section 3.3 REMOTE PERSONNEL DECONTAMINATION SYSTEM during exterior abatement work.

E. Maintain a work area access control log for each exterior work area.

3.9 ASBESTOS REMOVAL PROCEDURE - GENERAL

A. The Contractor shall have a designated "Competent Person" on the job at all times to ensure establishment of a proper enclosure system and proper work practices throughout the project. At a minimum, the Contractor’s Competent Person shall perform or supervise the following duties, as applicable:

1. Ensure the integrity of the containment or enclosure.
2. Set up procedures to control entry to and exit from the enclosure.
3. Supervise employee exposure monitoring.
4. Ensure that employees set up, use and remove engineering controls, use work practices and personal protective equipment in compliance with applicable regulations and the technical specifications.
5. Ensure that employees use the worker decontamination facilities and observe decontamination procedures.
6. Supervise and direct abatement activities in a manner that meet the intent of this technical specification and applicable regulations.
7. Quantify asbestos waste generated during the project.
8. Perform final visual inspections in conjunction with the Asbestos Project Monitor.

B. Abatement work will not commence until all work area preparation is completed in accordance with this Specification.

C. Spray asbestos materials with amended water using airless spray equipment or apply approved removal wetting agent to reduce the release of fibers during removal operation. The Consultant will pre-approve use of amended water as the wetting agent.

D. Spraying of amended water shall be adequate enough to allow the ACM to absorb the water. Actual removal of ACM shall not be allowed until all ACM has become adequately wet.

E. Fill disposal containers as removal proceeds, seal filled containers before moving to waste load out system. Wet clean each container thoroughly, double bag, drum or use other approved containerization methods and apply a caution label before moving to holding area. Floor tile waste shall be containerized in rigid lined drums.

F. Remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris.

G. Solidify all liquid waste prior to containerization for disposal.

H. Sealed disposal containers and all equipment used in the work area shall be included in the cleanup and shall be removed from work areas, via the waste load out system at an appropriate time in the cleaning sequence.

I. At any time during asbestos removal, should the competent person suspect contamination of areas outside the work area(s), they shall cause to stop all abatement work until steps to decontaminate these areas and eliminate causes of such contamination are completed. Unprotected individuals shall be prohibited from entering suspected contaminated areas until air sampling and visual inspections certify decontamination.

J. Upon acceptance of the work area by the Owner's Representative, the Contractor shall apply an even coating of bridging encapsulant to all exposed surfaces contained within the work area. Apply encapsulant in accordance with manufacturer's recommendation.

K. Re-occupancy air monitoring shall be performed within each work area that contains greater than three (3) linear feet or three (3) square feet of asbestos-containing materials.

3.10 MINIMUM SPECIFIC ASBESTOS REMOVAL PROCEDURES – WINDOW GLAZING COMPOUND

A. The Contractor will remove the entire window unit as exterior abatement.

B. Minimum specific requirements relative to the removal of asbestos-containing window glazing compounds are as follows:

1. Prior to the removal of any window, the contractor shall ensure that critical barriers are placed on the interior side of the window and exterior ground surfaces are protected with six mil polyethylene sheeting.
2. Post asbestos abatement warning signs and erect temporary barricades to create regulated areas. Regulated areas should be kept clear of any persons not fully trained and protected against exposure.
3. Pre-clean ground surface and interior floor surfaces contaminated with ACM window material, using HEPA vacuum equipment or shovels as appropriate.
4. The contractor shall sufficiently wet ACM with removal encapsulant, amended water, or a detergent solution to minimize dust during work.
5. Remove window unit intact (including frames and sashes). Lower window until to ground and wrap in poly sheeting and place in dumpster for disposal as mixed asbestos and PCB ≥50 ppm waste. Window Glazing Compounds are assumed to have PCB concentrations ≥50 ppm.

6. Remove any remaining ACM window caulking from concrete window opening.
7. Collect any glazing compound or paint debris in drop cloths and dispose of debris and drop clothes as mixed asbestos and PCB ≥50 ppm bulk product waste.

3.11 MINIMUM SPECIFIC ASBESTOS REMOVAL PROCEDURES – WALL CAVITIES.

A. Minimum specific requirements relative to the removal of assumed asbestos-containing non-friable wall cavity products are as follows.

1. Prior to the removal of any non-friable wall cavity products, the Contractor shall ensure the work area is prepped in accordance with the requirements of Section 3.7 INTERIOR WORK AREA PREPARATION – GENERAL AND 3.2 CONTIGUOUS PERSONNEL DECONTAMINATION SYSTEM.
2. Perform selective demolition in each work area as necessary to access asbestos containing materials. Selective demolition that may potentially disturb the ACM must be performed once the area is under containment.
3. The Contractor shall continuously mist the non-friable wall cavity products with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow wetting agent to puddle, or run off to other areas. If removal encapsulant is used, use in strict accordance with the manufacturer's instructions.
4. Remove wall and wall cavity materials using manual or mechanical methods. All equipment must be fitted with a HEPA filtration system. Continuously mist walls in area where wall materials are being removed. Wet any debris generated as necessary to keep continuously wet.
5. Continuously pick up tiles, place in lined drums or in nylon mesh bags. Place nylon mesh bags into six mil thick disposal bags with pre-printed OSHA warning labels. Ensure that all waste is placed in a second six mil disposal bag during waste load out operations.
6. All liquid wastes shall be solidified once packaged for disposal. No liquid wastes shall be permitted to leave the site in liquid form.
7. Work areas shall be subject to final visual inspection(s) and re-occupancy air clearance sampling.

3.9 MINIMUM SPECIFIC ASBESTOS REMOVAL PROCEDURES: NON-FRIABLE ROOFING MATERIALS

NOTE: SEE ROOF SPECIFICATIONS FOR ADDITIONAL INFORMATION.

A. Minimum specific requirements for removal of non-friable roofing materials are as follows:

1. Prior to the removal of any non-friable roofing materials, the Contractor shall ensure that the work area is prepped in accordance with Section 3.8 EXTERIOR WORK AREA PREPARATION AND 3.3 REMOTE PERSONNEL DECONTAMINATION SYSTEM.
2. Non-friable roofing materials shall be maintained in a non-friable condition during removal. Do not subject non-friable roofing materials to cutting, grinding, sanding, abrading or other forces that would render the material friable.

3. Wet non-friable roofing materials with amended water prior to removal. Where flashing cements, tars, felts are specified for removal, remove all layers, regardless of composition, down to substrate.

4. Insulation or other materials in contact with the non-friable asbestos-containing roofing material shall be disposed of asbestos contaminated material.

B. Prior to the removal of any non-friable roofing materials, the Contractor shall ensure that work area preparation has been conducted in accordance with this technical specification section.

C. The Contractor shall sufficiently wet roofing materials with removal encapsulant, amended water, or a detergent solution.

D. The non-friable asbestos containing roofing materials shall not be cut, sanded, abraded or otherwise made friable during abatement and shall remain intact and non-friable during removal procedures.

E. All ACM shall be placed directly into disposal bags or shall be transferred to the asbestos disposal dumpster. Do not allow waste to accumulate on the roof. The Contractor shall ensure that no visible emissions are generated during any portion of the abatement operation.

F. The Contractor shall remove from the roof all abated asbestos containing roofing materials at the end of each work shift.

G. Material drop shall not exceed eight 8 feet. For heights up to 15 feet, provide inclined chutes or scaffolding to intercept drop. For heights exceeding 15 feet, Contractor shall provide an enclosed dust-proof chute.

H. For roofing materials that are live loaded into open top waste container, the Contractor shall line the waste container with a minimum of two layers of six mil polyethylene sheeting. Secure the waste container at the end of each work shift.

3.10 MINIMUM SPECIFIC ASBESTOS REMOVAL PROCEDURES: EXTERIOR WINDOW FELT/TAR

A. If Window Felt/Tar behind brick portions is encountered during demolition the Consultant will sample the materials for asbestos accordingly. Operations involving the cutting or abrading of window felt/tar is considered to release sufficient friable material thus constituting an asbestos abatement activity. All work using such equipment must be performed by licensed asbestos workers in a negative pressure enclosure. These restrictions may be lifted if manual means to remove the asbestos materials and EPA and/or state guidance on abatement of window felt/tar materials is followed.

B. Minimum specific requirements for removal of non-friable window felt/tar materials are as follows:

1. Prior to the removal of any non-friable window felt/tar materials, the Contractor shall ensure that the work area is prepped in accordance with Section 3.8 EXTERIOR WORK AREA PREPARATION AND 3.3 REMOTE PERSONNEL DECONTAMINATION SYSTEM.

2. Perform procedures as necessary including the application of wet methods and covering materials to ensure that release of asbestos materials is reduced to no

visible emissions. Work using any cutting or abrading equipment must be performed in a negative pressure enclosure.

3. Remove asbestos window felt/tar using tools and equipment specified in regulatory guidance documents.

4. Continuously mist the work area as exterior asbestos containing materials are removed from the structure.

5. All loose debris shall be immediately collected via HEPA vacuum or wet wiping. The vacuum debris and wipe materials shall be segregated and disposed as asbestos contaminated waste.

6. Wet methods shall be used whenever operations call for the scraping of window felt/tar.

3.11 FINAL CLEANING AND ENCAPSULATION

A. Upon completion of gross removal of all ACM specified for removal, the Contractor shall begin final cleaning of the effected work area. The Contractor shall HEPA vacuum and wet wipe all surfaces contained within the work area.

B. All tools or equipment that are not necessary for final cleaning shall be decontaminated or bagged and removed from the work area enclosure.

C. The Contractor shall begin final cleaning procedures at the furthest and highest most points from the personnel decontamination unit and move towards the unit. The Contractor shall ensure that all exposed building components and or surfaces are thoroughly HEPA vacuumed and wet wiped.

D. The Contractor shall HEPA vacuum and wet wipe any component specified to remain inside the work area enclosure.

E. The Contractor shall thoroughly wet wipe all polyethylene sheeting inside the work area enclosure.

F. Once all surfaces and components within the work area have been thoroughly cleaned, the Contractor's Competent Person shall perform a visual inspection of all surfaces and components within the work area enclosure. The Contractor's Competent Person shall sign off on the work area stating that all abatement has been completed for that portion of work and that the work area has met final visual inspection requirements as outlined in ASTM E1368.

G. The Contractor's Competent Person shall then request a final visual inspection to be performed by the Owner's Representative. The Owner's Representative shall visually inspect all surfaces and components in the work area for residual debris and or dust. Additional cleaning shall be performed at the Contractor's expense if the Owner's Representative identifies visual debris and/or dust during the visual inspection. Additional cleaning shall be performed until the work area meets the Final Visual Inspection requirements outlined in ASTM E1368.

H. Upon acceptance of the work area by the Consultant, the Contractor shall apply an even layer of bridging encapsulant to all surfaces contained within the work area. The Consultant shall verify the completeness of work area encapsulation.

3.12 EXTERIOR WORK AREAS FINAL CLEANING

A. Upon completion of gross removal of all ACM specified for removal, the Contractor shall begin final cleaning of the effected work area. The Contractor shall wet debris that has accumulated on the drop cloths. And shall roll up the drop cloths ensuring that all debris is contained within the polyethylene sheeting.

B. The Contractor shall HEPA vacuum and wet wipe surrounding surfaces contained within the work area.

C. The Contractor shall begin final cleaning procedures at the furthest and highest most points from the personnel decontamination facility. The Contractor shall ensure that all exposed building components and or surfaces contained within the work area are thoroughly HEPA vacuumed and wet wiped.

3.13 WASTE PACKAGING AND REMOVAL PROCEDURE

A. The Contractor shall strictly adhere to the requirements of this section for ACM waste packaging and transporting waste from the work area enclosure to the disposal dumpster.

B. Waste disposal bags and drums shall be affixed with pre-printed OSHA warning labels, DOT labels and NESHAP labels.

C. Each container of ACM waste shall be made adequately wet prior to sealing the container. Bags shall be sealed immediately following additional wetting procedures. Bags of ACM waste shall not be permitted to remain unsealed while in the work area enclosure.

D. Each bag of ACM waste shall be double-bagged during waste load out procedures. The following waste load out procedure shall be strictly adhered to:

1. Wet wipe inner bag or drum to remove all ACM contamination. Ensure the inner bag is sealed.
2. Transport bag or drum to the equipment room located in the worker decontamination enclosure.
3. One worker, equipped with personal protective equipment, shall be inside the clean room of the worker decontamination enclosure.
4. The worker in the clean room of the decontamination enclosure shall open a six-mil disposal bag and hold it open inside the shower room where the inner bag containing the ACM waste shall be placed.
5. The outer bag shall be sealed with duct tape inside the shower room.
6. The double bagged or drummed waste shall be removed from the decontamination enclosure and waste generator labels shall be immediately affixed to the outer bag or drum.
7. Waste generator labels shall be printed self-adhering labels and shall contain the Owner's name, the site location address, and the Contractor's name.
8. The properly labeled waste shall be transported directly to the lined waste container.
9. The waste container shall be double lined with six mil polyethylene sheeting.
10. OSHA warning signs shall be secured to the waste container prior to any loading and unloading operations.
11. The waste container shall be kept locked at all times other than loading and unloading.

3.14 DISPOSAL OF ASBESTOS AND ASBESTOS CONTAMINATED WASTE

A. All disposal of asbestos containing and or asbestos contaminated material must be in compliance with requirements of the Office of the Department of Energy and Environmental Protection (CTDEEP), State of Connecticut Department of Public Health (CTDPH) and the EPA NESHAP regulations.

B. Disposal approvals shall be obtained from the CTDEEP before commencing asbestos removal if waste will be disposed of in Connecticut.

C. Waste container storage locations shall be pre-approved by the Owner and Consultant.

D. A copy of approved disposal authorization shall be provided to the Owner and Consultant and any required federal, state or local agencies.

E. Copies of all landfill receipts will be retained by the Consultant as part of the project file. The receipts will be signed by the landfill operator on receipt, and the quantity of asbestos debris leaving the job site and arriving at the landfill acknowledged.

F. All asbestos debris shall be transported in covered, sealed vans, boxes or dumpsters, which are physically isolated from the driver by an airtight barrier. All vehicles must be properly licensed to meet United States Department of Transportation (DOT) requirements.

G. Friable ACM waste shall be placed in double lined enclosed waste containers equipped with a lockable hasp. Waste containers shall be posted with OSHA warning signs during loading and unloading.

H. All liquid waste generated during the work shall be solidified. At no time will liquid wastes be permitted to be stored on site. Liquid waste generated during this project shall be solidified prior to the end of each work shift.

I. Completed Waste Shipment Records (WSR) signed by the landfill must be returned to the Owner or Owner's Representative no later than 45 days from the time the waste was transported off-site. Completed waste shipment records that are not received by the Owner within 35 days shall require the Contractor to begin tracking the waste. The Contractor must notify the Owner of intentions on tracking the waste.

J. The Contractor must take appropriate actions as outlined in 40 CFR Part 61 NESHAP regulations when completed WSR are not forwarded to the Owner or Consultant within 45 days from the time the waste was transported off-site.

3.15 REOCCUPANCY AIR CLEARANCE MONITORING

A. After the presealant visual inspection has passed and all surfaces in the abatement area have dried, reoccupancy air clearance monitoring will be performed. The primary and secondary barriers, worker decontamination enclosure, and negative air filtration units shall remain in place. At no time shall tools, ladders, vacuums or waste remain inside the work area enclosure during final air clearance sampling.

B. Once the work area has dried, the Consultant shall collect aggressive reoccupancy air clearance samples. Aggressive air monitoring will be used. Selection of location and of samples shall be the responsibility of the Consultant. Air monitoring volumes shall be sufficient to provide a detection limit of 0.010 f/cc (fiber per cubic centimeter of air) using NIOSH-approved method.

C. Areas that do not comply with the reoccupancy air clearance criteria shall continue to be cleaned by and at the Contractor's expense until the specified reoccupancy air clearance criteria is achieved as evidenced by results of air testing as previously specified.

D. Laboratories conducting analysis of final air clearance samples shall be approved by the State of Connecticut Department of Health.

3.25 CONSULTANT RESPONSIBILITY

A. The Owner has retained the services of Tighe & Bond to monitor this project. The Consultant shall collect and analyze air samples to ascertain the integrity of controls, which protect the building from asbestos contamination. Independently, the Contractor shall monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.

B. The Owner's Representative shall collect and analyze air samples during a minimum of three time periods:

1. Pre-Abatement Sampling Period: The Asbestos Abatement Project Monitor shall collect a sufficient number of air samples, inside and outside the proposed work area locations, to establish background air quality conditions. At least one sample will be taken outside of the building.

   a. Pre-Abatement air samples shall be collected for a minimum period of ninety minutes at a minimum flow rate of 12 liters per minute, or as required to obtain a volume of 1,000 liters. Samples shall be analyzed by PCM using the NIOSH 7400 protocol.

2. Abatement Period: The Asbestos Abatement Project Monitor shall collect samples on a daily basis during the work period. A sufficient number of background samples shall be taken outside of the work area, at the exhaust of the negative pressure filtration equipment, and outside of the building to evaluate the degree of cleanliness or contamination of the building during asbestos removal. Additional samples may be taken inside the work area and decontamination enclosure system, at the discretion of the Asbestos Abatement Project Monitor.

   a. The Asbestos Abatement Project Monitor shall provide a continual evaluation of the air quality of the building during asbestos abatement, using his/her best professional judgments in respect to the CTDPH guideline of 0.010 f/cc and the background air quality established during the pre-abatement period.

   b. If the Asbestos Abatement Project Monitor determines that the building air quality has become contaminated from the project, he/she shall immediately inform the Contractor to cease all removal operations and implement a work stoppage clean up procedure. The Contractor shall conduct a thorough cleanup of areas of the building designated by the Asbestos Abatement Project Monitor. No further asbestos abatement work shall take place until the Asbestos Abatement Project Monitor has determined that the building's air has been decontaminated.

   c. Abatement air samples shall be collected for a minimum period of ninety minutes at a minimum flow rate of 12 liters per minute, or as required to

obtain a volume of 1,000 liters. Samples shall be analyzed by PCM using the NIOSH 7400 protocol.

3. Elevated fiber counts: If elevated fiber counts exceeding the establish pre-abatement level or 0.010 f/cc are recorded, the cause for such elevated readings shall be investigated. If necessary, the Contractor shall be responsible for cleaning the affected area and will provide additional support to lower the air born fiber levels. All cost incurred by the Contractor for the decontamination work shall be borne by the Contractor.

4. Reoccupancy Clearance Period: The Asbestos Abatement Project Monitor shall conduct air sampling following the final cleanup phase of the project, once the "no visible residue" criterion as established by the site supervisor and the Asbestos Abatement Project Monitor has been met.

   a. PCM - For work areas containing less than 500 linear feet or 1,500 square feet of ACM, post abatement analysis of the samples to determine if reoccupancy clearance standards have been met shall be conducted by PCM. A minimum of 5 samples shall be collected inside containment utilizing aggressive methods to comply with State of Connecticut DPH Standard for Asbestos Abatement sections 19a-332a-12, and 19a-332a-13. The project shall be considered complete when the results of samples collected in the work area and analyzed by phase contrast microscopy using the most current National Institute for Occupational Safety and Health (NIOSH) method 7400, to show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantification for PCM (0.010 fibers per cubic centimeter of air).

B. Inspections shall be conducted by the Owner's Representative throughout the progress of the abatement project. Inspections shall be in order to document the progress of the abatement work as well as the procedures and practices employed by the Contractor. The Asbestos Abatement Project Monitor shall perform the following inspections during the course of abatement activities.

1. Precommencement Inspection: Precommencement inspections shall be performed at the time requested by the Contractor. The Asbestos Abatement Project Monitor shall be informed 24 hours prior to the time the inspection is needed. During the course of the precommencement inspection, the Asbestos Abatement Project Monitor shall inspect the containment. This shall include, but not be limited to, inspection of barrier integrity, the worker decontamination, facility, negative air filtration equipment etc. If during the course of the precommencement inspection, deficiencies are found, the Contractor shall perform the necessary adjustments in order to obtain compliance.

2. Work Area Inspections: Work area inspections shall be conducted on a daily basis at the discretion of the Asbestos Abatement Project Monitor. During the course of the work area inspections, the Asbestos Abatement Project Monitor shall observe the Contractor removal procedures, verify barrier integrity, monitor negative air filtration devices, assess project progress, and inform the Contractor of specific remedial activities if deficiencies are noted.

3. Presealant Inspection: Upon the request of the Contractor, The Asbestos Abatement Project Monitor shall conduct a presealant inspection. The presealant

inspection shall be conducted after completion of the initial final cleaning procedures, but prior to work area encapsulation. The presealant inspection shall verify that all ACM and residual debris have been removed from the work area. If, during the course of the presealant inspection, the Asbestos Abatement Project Monitor identifies residual dust or debris, the Contractor shall comply with the request of the Asbestos Abatement Project Monitor, in order to render the area is free of visible residue.

4. Final Visual Inspection: Following receipt of acceptable reoccupancy air monitoring results and concurrent with removal of the work area containment, the Asbestos Abatement Project Monitor shall conduct a final visual inspection. If residual dust or debris is identified during the course of the final inspection, the Contractor shall comply with the request of the Asbestos Abatement Project Monitor, in order to render the area free of visible residue.

END OF SECTION 13281

SECTION 13282

LEAD PAINT AWARENESS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract.

B. Refer to Addendum 3, Phase Zero Drawings provided by Goody Clancy, dated September 28, 2016.

C. Contractor MUST also reference Section 01350 – Health & Safety Plan for Abatement, Section 02120 – Transportation and Disposal of Contaminated Materials, Section 13281 – Asbestos Abatement, and Section 13286 – Assumed PCB Contaminated Building Materials Abatement.

1.2 SUMMARY OF WORK

A. Work in this Section includes, requirements for worker protection and waste disposal related to the work involving surfaces containing lead within the Gant Science Complex.

B. Surfaces identified as containing lead paint for the project include:

- CMU Walls (< 1 mg/cm^2)

C. The procedures referenced herein shall be utilized during required abatement and demolition work specified elsewhere in the Specifications that might impact lead. Also refer to Section 13286 – Assumed PCB Contaminated Building Materials Abatement as some paints containing lead are also assumed to contain PCBs.

D. The renovation work impacting lead-containing paint may result in dust and debris exposing workers to levels of lead above the Occupational Safety and Health Administration's (OSHA) Action Level. Worker protection, training, and engineering controls referenced herein shall be strictly adhered to, until completion of exposure assessment with results indicating exposures below the "Action Level".

E. Construction activities disturbing surfaces with lead-containing paint that are likely to be employed, such as demolition, sanding, grinding, welding, cutting and burning, have been known to expose workers to levels of lead in excess of the OSHA Permissible Exposure Limit (PEL).

1.3 DEFINITIONS

A. The following definitions relative to lead paint as used in this Section are offered:

1. ACTION LEVEL (AL): The allowable employee exposure, without regard to use of respiratory protection, to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current action level is

thirty micrograms per cubic meter of air (30 µg/m).

2. AREA MONITORING: The sampling of lead concentrations, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.

3. BIOLOGICAL MONITORING: The analysis of a person's blood and/or urine, to determine the level of lead concentration in the body.

4. CHANGE ROOM: An area provided with separate facilities for clean protective work clothing and equipment and for street clothes, which prevents cross-contamination.

5. COMPETENT PERSON: A person employed by the Contractor who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions, and who has authorization to take prompt corrective measures to eliminate them as defined by OSHA.

6. EXPOSURE ASSESSMENT: An assessment conducted by an employer to determine if any employee may be exposed to lead at or above the action level.

7. "HIGH EFFICIENCY PARTICULATE AIR" (HEPA): A type of filtering system capable of filtering out particles of 0.3 microns diameter from a body of air at 99.97% efficiency or greater.

8. LEAD: Refers to metallic lead, inorganic lead compounds and organic lead soaps. Excluded from this definition are other organic lead compounds.

9. LEAD WORK AREA: An area enclosed in a manner to prevent the spread of lead dust, paint chips, or debris resulting from lead-containing paint disturbance.

10. LEAD PAINT: Refers to paints, glazes and other surface coverings containing a toxic level of lead.

11. PERMISSIBLE EXPOSURE LIMIT (PEL): The maximum allowable limit of exposure to an airborne concentration of lead over an eight (8) hour time weighted average (TWA), as defined by OSHA. The current PEL is fifty micrograms per cubic meter of air (50 $\mu g/m^3$). Extended workdays lower the PEL by the formula: PEL equals 400 divided by the number of hours of work.

12. PERSONAL MONITORING: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62 and 29 CFR 1910.1025. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a sphere with a radius of 18 inches and centered at the nose or mouth of an employee.

13. RESOURCE CONSERVATION RECOVERY ACT (RCRA): RCRA establishes regulatory levels of hazardous chemicals. There are eight (8) heavy metals of concern for disposal: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. Six (6) of the metals are typically found in paints, excluding selenium and silver.

14. TOXIC LEVEL OF LEAD: A level of lead, when present in dried paint or plaster, contains more than 0.50% lead by dry weight as measured by atomic absorption spectrophotometry (AAS) or 1.0 mg/cm^2 as measured by on-site testing utilizing an x-ray fluorescence analyzer. (Term is specific to State of CT regulations and HUD

guidelines only)

15. TOXICITY CHARACTERISTIC LEACHATE PROCEDURE (TCLP): The U.S. Environmental Protection Agency (USEPA) required sample preparation and analysis for determining the hazard characteristics of a waste material.

1.4 REGULATIONS AND STANDARDS

A. The following regulations, standards, and ordinances of federal, state, and local agencies are applicable and made a part of this specification by reference:

1. American National Standards Institute (ANSI)
ANSI 288.2 - 1980 Respiratory Protection

2. Code of Federal Regulation (CFR)

a. 29 CFR 1910.134 - Respiratory Protection

b. 29 CFR 1910.1025 - Lead

c. 29 CFR 1926.62 - Lead in Construction Interim Final Rule

d. 29 CFR 1910.1200 - Hazard Communication

e. 29 CFR 1926.59 - Hazard Communication in Construction

f. 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists

g. 29 CFR 1926.57 - Ventilation

h. 40 CFR 260 - Hazardous Waste Management Systems: General

i. 40 CFR 261 - Identification and Listing of Hazardous Waste

j. 40 CFR 262 - Generators of Hazardous Waste

k. 40 CFR 263 - Transporters of Hazardous Waste

l. 40 CFR 264 - Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

m. 40 CFR 265 - Interim Statutes for Owner and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

n. 40 CFR 268 - Lead Disposal Restrictions

o. 40 CFR 172 - Hazardous Materials Tables and Communication Regulations

p. 40 CFR 178 - Shipping Container Specifications

q. 40 CFR 270 and 124 - Hazardous Waste Permits

3. State of Connecticut Department of Energy and Environmental Protection (DEEP)

a. Guidance for the management and disposal of lead contaminated materials generated in the lead abatement renovation and demolition industries.

4. Underwriters Laboratories, Inc. (UL)

UL586 - 1990 High Efficiency Particulate Air Filter Units

1.5 QUALITY ASSURANCE

A. Hazard Communication Program

The Contractor shall establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

B. Compliance Plan (Site Specific)

The contractor shall establish a written compliance plan, which is specific to the project site, to include the following:

1. A description of work activity involving lead including equipment used, material included, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.
2. Methods of engineering controls to be used to control lead exposure.
3. The proposed technology the Contractor will implement in meeting the PEL.
4. Air monitoring data documenting the source of lead emissions.
5. A detailed schedule for implementing the program, including documentation of appropriate supply of equipment, etc.
6. Proposed work practice which establishes proper protective work clothing, housekeeping methods, hygiene facilities, and practices.
7. Worker rotation schedule, if proposed, to reduce TWA.
8. A description of methods for informing workers of potential lead exposure.

C. Hazardous Waste Management

The Contractor shall establish a Hazardous Waste Management Plan, which shall comply with applicable regulations and address the following:

1. Identification of hazardous wastes
2. Estimated quantity of waste to be disposed of
3. Names and qualifications of each sub-contractor that will be transporting, storing, treating, and disposing of wastes
4. Disposal facility location and 24-hour point of contact
5. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes
6. List of waste handling equipment to be used in performing the work to include cleaning, volume reduction, if applicable, and transport equipment
7. Qualifications of laboratory to be utilized for TCLP sampling and analysis

8. Spill prevention, containment, and cleanup contingency measures

9. Work plan and schedule for waste containment, removal, treatment, and disposal

D. Medical Examinations

1. Before exposure to lead contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1910.1025 and 29 CFR 1926.62.

2. The examination shall not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62 within the last year.

3. Medical examination shall include, at a minimum, approval to wear respiratory protection and biological monitoring.

E. Training

1. The Contractor shall ensure that workers are trained to perform lead paint disturbing activities and disposal operations prior to the start of work in accordance with 29 CFR 1926.62.

F. Respiratory Protection Program

1. The Contractor shall furnish each employee required to wear a negative pressure respirator with a respirator fit test at the time of initial fitting and at least once every 12 months thereafter as required by 29 CFR 1926.62.

2. The Contractor shall establish a Respiratory Protection Program in accordance with ANSI Z88.2, 29 CFR 1910.134, and 29 CFR 1926.62.

1.6 SUBMITTALS

A. The Contractor shall submit to the Consultant the following submittals prior to start of work:

1. Copies of all notifications, permits, applications, licenses and like documents required by federal, state and local regulations obtained or submitted in proper fashion.

2. Copies of medical records for each employee to be used on the project.

3. Record of successful respirator fit testing performed by a qualified individual within the previous year, for each employee to be used on this project with the employee's name and social security number with each record.

4. Proposed respiratory protection program for employees throughout all phases of the job, including make, model and NIOSH approval numbers of respirators to be used.

5. Written description, for the Engineers review and acceptance, of all proposed procedures, methods or equipment to be utilized that differ from the Contract Specifications, including manufacturers' specifications on any equipment not specified for use by this Section; in all instances, the Contractor must comply with

all applicable federal, state and local regulations.

6. List of all supervisors and workers intended to be assigned to the project and certificates of training.

7. The name and address of Contractor's blood lead testing lab, OSHA-CDC listing, and Certification in the State of Connecticut.

8. The name and address of Contractor's personal air monitoring and waste disposal lead testing laboratory (ies) including certification(s) of AIHA accreditation for heavy metal analysis, listing of relevant experience in air and debris lead analysis.

9. Safety Data Sheets (SDS) on all materials and chemicals to be used on the project.

10. Name, address, and ID number of the hazardous waste hauler, waste transfer route, and proposed disposal site.

11. Name, address, and ID number of the proposed construction debris site.

12. Copy of each worker’s initial blood lead level and zinc protoporphorin level.

B. The Contractor shall submit to the Owner or Consultant the following submittals during the job:

1. Results from personal air samples.

2. Medicals, certificates, and fit test 24 hours in advance of any new employee starting on the project.

C. The Contractor shall submit to the Owner the following submittals upon completion of the work:

1. Copies of manifests and receipts acknowledging disposal of all hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.

1.7 PERSONAL PROTECTION

A. Exposure Assessment

1. The Contractor shall determine if any worker will be exposed to lead at or above the action level.

2. The exposure assessment shall identify the level of exposure a worker would be subjected to without respiratory protection.

3. The exposure assessment shall be achieved by obtaining personal monitoring samples representative of a full shift at a minimum (8-hour TWA).

4. During the period of the exposure assessment, the Contractor shall institute the following procedures for protection of workers.

a. Protective clothing shall be utilized

b. Respiratory protection

c. Change areas shall be provided

d. Hand washing facilities and shower

e. Biological monitoring

f. Training of workers

B. Respiratory Protection

1. The Contractor shall furnish appropriate respirators approved by NIOSH/MSHA for use in atmospheres containing lead dust.

2. Respirators shall comply with the requirements of 29 CFR 1926.62.

3. Workers shall be instructed in all aspects of respiratory protection.

4. The Contractor shall have an adequate supply of HEPA filter elements and spare parts on site for all types of respirators in use.

5. The following minimum respirator protection for use during paint removal or demolition of components and surfaces with lead paint shall be the 1/2 mask air purifying respirator with high efficiency filters for exposures (not in excess of 500 $\mu g/m^3$ or 10 x PEL).

C. Protective Clothing

1. Personal protective clothing shall be provided for all workers, supervisors, and authorized visitors entering the work area.

2. Each worker shall be provided with a minimum of two complete disposable coverall suits.

3. Removal workers shall not be limited to two suits, and the Contractor shall supply additional suits as necessary.

4. Under no circumstances shall anyone entering the lead removal area be allowed to re-use a contaminated disposable suit.

5. Disposable suits, such as TYVEK suits, and other personal protective equipment (PPE) shall be donned prior to entering the lead control area. A change room shall be provided for workers to put on suits and other personal protective equipment with separate areas to store their street clothes.

6. Eye protection for personnel engaged in lead operations shall be furnished when the use of a full-face respirator is not required.

7. Goggles with side shields shall be worn when working with power tools or a material that may splash or fragment, or if protective eye wear is specified on the Safety Data Sheet (SDS) for a particular product to be used on the project.

1.8 PERSONAL MONITORING

A. General. The Contractor is required to perform the personal air sampling activities during lead paint disturbing work. The results of such sampling shall be posted, provided to individual workers and submitted to the Owner as described herein.

B. Sampling. Samples shall be taken for the duration of the work shift or for eight hours, whichever is less. Personal samples need not be taken every day after the first day if working conditions remain unchanged, but must be taken every time there is a change in removal operations, either in terms of the location or the type of work. Sampling will be used to determine eight-hour Time-weighted averages (TWA). The Contractor is responsible for personal sampling as outlined in OSHA Standard 29 CFR 1926.62 and 29 CFR 1910.1025.

C. Sampling Results. Air sampling results shall be reported to individual workers in written form no more than 48 hours after the completion of a sampling cycle. The reporting document shall list each sample's result, sampling time and date, personnel monitored and their social security numbers, flow rate, sample duration, sample yield, cassette size, and analysts' name and company, and shall include an interpretation of the results. Air sample analysis results will be reported in micrograms/cubic meter ($\mu g/m^3$).

D. Testing Laboratory. The Contractor's testing lab shall be participating in AIHA's Environmental Lead Laboratory Accreditation Program (ELLAP). The Contractor shall submit to the Consultant for review and acceptance, the name and address of the laboratory, certification(s) of AIHA participation, a listing of relevant experience in air lead analysis, and presentation of a documented Quality Assurance and Quality Control Program.

PART 2 - PRODUCTS

2.1 GENERAL

A. Any substitution in materials, equipment, or methods to those specified shall be approved by the Owner prior to use. Any requests for substitution shall be provided in writing to the Owner. The request shall clearly state the rationale for the substitution.

2.2 MATERIALS AND PRODUCTS

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name and product technical description.

B. Damaged or deteriorating materials shall not be used and shall be removed from the premises.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the job including protective clothing, respirators, filter cartridges, polyethylene sheeting of proper size and thickness, tape, and air filters.

D. Materials

1. Polyethylene sheet in a roll size to minimize the frequency of joints shall be delivered to job site with factory label indicating 6 mil. One layer of six mil polyethylene sheeting shall be used for ALL lead removal work areas.

2. Polyethylene disposable bags shall be six (6) mil. Tie wraps for bags shall be plastic, five inches long (minimum), pointed and looped to secure filled plastic bags.

3. Tape or adhesive spray will be capable of sealing joints in adjacent polyethylene sheets 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.

4. Impermeable containers are to be used to receive and retain any lead containing or contaminated materials until disposal at an acceptable disposal site. (The containers shall be labeled in accordance with EPA and DOT standards.)

2.3 TOOLS AND EQUIPMENT

A. Provide suitable tools for all lead disturbing operations.

B. The Contractor shall have available power cables or sources such as generators (where required).

PART 3 - EXECUTION

3.1 WORKER PROTECTION/TRAINING

A. The Contractor shall provide appropriate training, respiratory and other personal protection, and biological monitoring for each worker and ensure proper usage during potential lead exposure and the initial exposure assessment.

B. Workers who will perform procedures must have completed one of the following training courses:

1. EPA Lead Abatement Supervisor (40 hours)
2. EPA Lead Abatement Worker (32 hours)
3. HUD/EPA course “Work Smart, Work Wet, and Work Clean to Work Lead Safe” (8 hours)
4. HUD “Lead Safe Work Practices” (8 hours)

C. Prepare the work areas according to the following general sequence of procedures to ensure that proper dust containment and protection systems are installed before any work which could generate lead dust.

1. Plastic Sheeting shall be polyethylene or equivalent with a thickness of at least 6 mil for all applications.

2. Erect barricades, post access restriction signs, and maintain a Decontamination Facility.

3. Obtain formal approval from Engineer of all preparation work and containment areas before commencing removal of items containing lead based paint. Engineer shall be given at least 48 hours notification of the intent to start removal work in any work area.

3.2 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is responsible for establishing and maintaining controls referenced

B. The Contractor is also responsible for conducting work with applicable federal, state, and local regulations as referenced herein.

3.3 WORKER HYGIENE PRACTICES (*Required during initial exposure assessment and if results of air sampling are above OSHA Action Level*)

A. Work Area Entry. Workers shall don personal protective equipment prior to entering work area, including at a minimum, disposable coveralls, gloves, eye protection, and proper footwear.

B. Work Area Departure. While in the work area, workers shall remove all gross contamination, debris, and dust from disposable coveralls and proceed to Decontamination Facility for implementation of proper worker decontamination.

C. Hand washing Facilities. All workers must wash their hands and faces upon leaving the work area.

D. Equipment. All equipment used by workers inside the work area shall be wet wiped or bagged for later decontamination before removal from the work area.

E. Prohibited Activities. Under no circumstances shall workers eat, drink, smoke, chew gum, or tobacco in the work area.

F. Shock Hazards. The Contractor is responsible for using safe procedures to avoid electrical hazards. All temporary electrical wiring will be protected by ground fault circuit interrupters (GFI).

3.4 LEAD WORK AREA (*Required during initial exposure assessment and if results of air sampling are above OSHA Action Level*)

A. The Contractor shall place warning signs at all entrances and exits from the work area. Signage shall be a minimum of 20" x 14" and shall state the following:

DANGER

LEAD WORK AREA

MAY DAMAGE FERTILITY OR THE UNBORN CHILD

CAUSES DAMAGED TO THE

CENTRAL NERVOUS SYSTEM

DO NOT EAT, DRINK OR SMOKE IN THIS AREA

B. The Contractor shall designate a change room as specified in this Section. The change room shall be adjacent to the lead work area and Decontamination Facility. The change room shall have separate storage facilities for street clothes to avoid cross contamination.

C. The Contractor shall provide potable water for hand and face washing and provide a portable shower unit.

D. The Contractor shall place six-mil polyethylene drop cloths on floor/ ground surfaces prior to beginning removal work to facilitate clean-up.

3.5 WORK AREA CLEAN UP

A. The Contractor shall remove all loose chips and debris from floor surfaces and place in waste disposal bags.

B. The Contractor shall HEPA vacuum adjacent surfaces to remove dust and debris. Polyethylene sheeting shall be properly disposed of.

3.6 WASTE DISPOSAL

A. Caution Note for Contractors: All materials, whether hazardous or non-hazardous, shall be disposed of in accordance with all laws and the provisions of any or all applicable federal, state, county, or local regulations and guidelines. It shall be the sole responsibility of the Contractor to assure compliance with all laws and regulations relating to this disposal.

B. All additional waste materials generated during the lead removal, paint chips, disposable clothing, polyethylene sheeting, waste water, etc., shall have confirmatory TCLP testing to determine waste characterization. This testing shall be performed and paid for by the Contractor. Results shall be furnished to the Owner and Engineer.

C. Metal components with lead paint can be recycled at an approved recycling facility unless PCB concentrations preclude recycling of this material under state or federal regulation.

END OF SECTION

SECTION 13286

ASSUMED PCB CONTAMINATED BUILDING MATERIALS ABATEMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section establishes requirements for the removal, segregation, management, and disposal of assumed Polychlorinated Biphenyls (PCB) containing building materials for the Phase Zero of the Gant Science Complex Renovations located on the Main Campus of University of Connecticut. In general, the following work involving assumed PCB containing materials is anticipated during this project:

1. Areas where assumed PCB containing building materials including painted items, caulking, and glazing compounds are being impacted during the Phase Zero Investigations/Mockups and disposed as PCB Bulk Product Waste.

2. Assumed PCB paints and caulking (≥50 ppm) on CMU walls that are proposed to be impacted during the investigations to access wall cavities. Asbestos-containing materials are also assumed to be within the wall cavities.

3. Assumed PCB caulking and glazing compounds (≥50 ppm) found on metal windows and adjacent brick during window mockup removal/replacement. The window glazing compound must be disposed as mixed asbestos/PCB bulk product waste.

4. Any painted building materials, caulking, glazing compounds to be impacted by the project must be considered to contain PCBs greater than or equal to 50 parts per million (≥50 ppm) and removed/disposed in accordance with this section.

5. Refer to Addendum 3, Phase Zero Drawings provided by Goody Clancy, dated September 28, 2016. The drawings identify locations of multiple investigations and mockups. Investigation types 2 and 3 involve disturbance of assumed PCB materials. Type 2 investigations include accessing wall cavities and Type 3 investigations include window removal/replacement for mockups.

6. Contractor is informed that renovation activities limited to the below referenced locations in Table 1 – List of assumed PCB containing materials.

TABLE 1: BASE BID SCOPE OF WORK

LOCATION(S)	MATERIAL TYPE	Result	QUANTITY
South Tower (North Elevation) – 2nd Floor**	Window Caulk	Assumed ≥50 ppm	2 Window Sets = 56 LF
South Elevation – 2nd Floor**	Window Glazing Compound*	Assumed ≥50 ppm	2 Window Sets = 80 SF
West Elevation (West Tower) – 3rd Floor** South Elevation (South Tower) – Ground Floor** North Elevation (South Tower) – 2nd Floor & Elevator Machine Rooms** East Elevation (South Tower) – 4th Floors West Tower – 1st and 2nd Floors**	Paint on CMU Walls and adjacent Expansion Joint Caulk	Assumed ≥50 ppm	20 Locations with 2 8"x16" CMU blocks = <40 SF

Notes: * Material is assumed to contain PCBs (≥50 ppm) and is asbestos-containing.

** Exact locations may be adjusted by the Owner but are used from the September 28, 2016 revised Goody Clancy Phase Zero Drawings Set.

B. The removal and disposal of building materials with PCBs is regulated by the Toxic Substance Control Act (TSCA) pursuant to Federal regulation 40 CFR 761. Demolition debris with PCBs are regulated as PCB Bulk Product Waste, if PCB concentrations are greater than or equal to 50 parts per million (ppm) as (ref: 40 CFR 761.50 (b) (4)). All paints, caulks, and tar papers in the work areas are assumed to contain concentrations of PCBs ≥ 50 ppm ("Bulk Product Waste") and managed, removed, cleaned, and disposed as such.

C. The removal and disposal of PCB contaminated building materials is also regulated under the Connecticut General Statutes (CGS) 22a-463 through 22a-469.

D. Work procedures for removal of PCB containing materials can be found in Section 3.5. If contradictions are identified in this Section immediately inform the Engineer.

E. Removal of PCB containing materials will be conducted under an "Assumed Approach" and does not require notification to Environmental Protection Agency (EPA) and Department of Energy and Environmental Protection (DEEP).

F. Related Sections

1. The Contractor **MUST** also reference Section 01350 – Health & Safety Plan, Section 02120 – Transportation and Disposal of Contaminated Materials, Section 13281 – Asbestos Abatement, Section 13282 – Lead Paint Awareness, Drawings, when forming the basis of their bid.

G. The intent of this section is to identify applicable regulations the Contractor shall comply with in order to perform demolition and renovation activities for this project related to assumed PCB containing building materials including health and safety procedures, worker training, demolition or removal procedures, and disposal

requirements. The Contractor is solely responsible for health and safety procedures related to their work.

H. If there are additional painted building materials or caulking to be impacted by Contractor as part of demolition or renovation activities notify the Engineer immediately. Contractor is responsible for confirming actual quantities to form the basis of their bid.

I. At least one week prior to the start of work a Pre-Construction Meeting will be scheduled and must be attended by the Contractor and any Sub-Contractors. The assigned Contractor Site Supervisor is also required to attend this meeting. The contractor shall present a detailed project schedule, work plan, and project submittals at the Pre-Construction Meeting. Variations, amendments, and corrections to the presented schedule will be discussed and the Owner and Engineer will inform the Contractor of any scheduling adjustments for this project. Following the Pre-Construction Meeting, the Contractor shall submit a revised schedule (if needed) no later than one week after the meeting.

1.2 DEFINITIONS

A. AUTHORIZED VISITOR - Any person authorized by the Owner to enter the building.

B. BUILDING OWNER - For this Contract only, the building Owner is University of Connecticut.

C. COMPETENT PERSON - A representative of the Contractor who is capable of identifying a PCB hazard and who has the authority to take prompt corrective measures to eliminate the hazard during PCB removal.

D. DECONTAMINATION ENCLOSURE SYSTEM - A series of connected areas, with curtained doorways between any two adjacent areas, for the decontamination of workers and equipment. A decontamination enclosure system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.

E. DOUBLE WASH METHOD – means a minimum requirement to cleanse solid surfaces two times with an appropriate solvent or other material in accordance with 40 CFR 761.360 Subpart S.

F. ENGINEER – Third Party Engineering/Environmental Consultant.

G. EPA – U.S. Environmental Protection Agency.

H. EXCLUDED PCB PRODUCTS - PCB materials that appear in concentrations of less than 50 ppm at the time of testing and were legally manufactured, processed, distributed in commerce, or used before October 1984.

I. HAZARDOUS WASTE MANIFEST - a form required by EPA and the Department of Transportation for all generators who transport, or offer for transport, hazardous waste for off-site treatment, recycling, storage or disposal.

J. HEPA FILTER - A high efficiency particulate air (HEPA) filter in compliance with ANSI Z9.2-1979.

K. HEPA VACUUM EQUIPMENT - Vacuum equipment with a HEPA filter system for filtering the effluent air from the unit.

L. NEGATIVE AIR FILTRATION EQUIPMENT - A portable local exhaust system equipped with HEPA filtration used to create negative pressure in a regulated area (negative with respect to adjacent unregulated areas) and capable of maintaining a constant, low velocity air flow into regulated areas from adjacent unregulated areas.

M. PCB REMOVAL WORKER - Any employee of a Contractor who engages in PCB removal.

N. PCB BULK PRODUCT WASTE - waste derived from any manufactured product that contain PCBs in a non-liquid state and the concentration of PCBs is 50 ppm or greater at the time the product is designated for disposal.

O. PCB LIQUID WASTE – liquids contaminated during PCB removal including but not limited to waste following DOUBLE WASH METHOD and shower waste water.

P. PCB REMEDIATION WASTE – waste containing PCBs as a result of a spill, release, or other unauthorized disposal. It also includes soil, rags, or other debris generated as a result of any PCB spill or cleanup.

Q. PCB WORK AREA - An area where PCB removal operations are performed which is isolated by physical boundaries to prevent the spread of PCB dust or debris.

R. PLASTICIZE - To cover floors and walls with plastic sheeting as specified herein.

S. POLYCHLORINATED BIPHENYLS (PCBS) - Any of several compounds that are produced by replacing hydrogen atoms in biphenyl with chlorine, have various industrial applications, and are toxic environmental pollutants which tend to accumulate in animal tissues. Probable human carcinogen per U.S. EPA.

T. TSCA - The Toxic Substances Control Act of 1976 (40 CFR Part 761) provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures.

U. WORK AREA - Designated rooms, spaces, or areas of the project in which PCB removal actions are occurring and which may become contaminated as a result of such removal actions. The work area must be totally self-contained by sealing, plasticizing and equipping the area with a decontamination enclosure system.

V. WORK STOPPAGE CLEANUP PROCEDURE - A process following the issuance of a stop work order, whereby the Contractor thoroughly cleans and decontaminates the work area, the decontamination enclosure system, and any other areas of the building affected by the removal project, to the satisfaction of the Engineer.

1.3 WORK INCLUDED

A. The project includes removal of assumed PCB-containing building materials and adjacent substrates to be impacted as part of Phase Zero of the activities. Phase Zero includes investigations and mockups in multiple locations at the Gant Science Complex. The investigations/mockups will include the impaction of assumed PCB paint/caulk on CMU walls in multiple locations and disturbance of caulk and glazing compounds on windows in locations determined by the Owner/Architect. The extent of removal is

dictated by Architects demolition and construction drawings for the project. Only those materials being impacted by the project are slated for removal unless otherwise specified in this section. Assumed PCB containing building materials are identified in Table 1 and locations of Type 2 and 3 investigations are shown on the drawings. These materials (source and substrate) must be managed and disposed by the Contractor (for disposal as well as health & safety purposes) as PCBs containing materials ≥ 50 ppm.

B. If additional suspect PCB containing materials (paints, caulks, or glazing compounds) are identified during the work that are not listed in Table 1 or shown in drawings, immediately inform the Engineer.

C. To ensure all Contractors are bidding on the approaches summarized herein, under NO circumstances shall the Contractor or affiliates of the Contractor (subcontractors, sub-consultants, etc.) contact the EPA or CTDEEP with respect to interpretations or the performance of the work specified herein.

D. The glazing compounds on the windows are also known to be asbestos-containing.

E. The paints on the CMU substrates are also known to have lead-containing paint (>0.009%).

F. Contractor is responsible for calculating actual quantities to form the basis of their bid. If contradictions are identified in this Section immediately inform the Engineer. Handling and disposal of all items identified in Table 1 are to be included in the bid price. PCB containing materials encountered within the work limits that are not identified will be paid for as a Change in Work based on unit prices.

G. As further detailed throughout this Section, NO sampling/analysis by the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) for total PCBs shall be performed at any point during the performance of the work, except as specifically authorized in writing by the Owner and Engineer. The Contractor shall collect a representative sample of the waste stream for PCB analysis via the Toxicity Characteristic Leaching Procedure (TCLP) for waste disposal purposes only. The Contractor is responsible for selecting disposal facilities that can accept PCB wastes with this restriction. If the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) take unauthorized samples and analyze them for total PCBs, then the contractor will be responsible for the cost of any resulting removal required under existing state and federal regulations triggered by their sampling and analysis. Consultant/Owner shall specifically review and approve in writing a proposed testing plan prior to samples being submitted for laboratory analysis.

H. In general, the following activities are minimum requirements of this Section and affect the demolition performed on assumed PCB containing building components:

1. No torch cutting of assumed PCB impacted materials shall be performed.

2. No demolition activities shall occur that can reasonably be expected to increase the worker's exposure above the Permissible Exposure Limits (PEL) for PCBs unless certain worker protection is implemented.

3. Workers shall be informed of the assumed PCB building components to be removed.

4. At a minimum, worker protection shall comply with applicable OSHA standards. Worker Right to Know and Health and Safety Standards of 29 CFR 1926 shall also apply to the work of this Section.

5. Unprotected, untrained workers or trades shall not perform any related work within or adjacent to work areas involving assumed PCB-containing building materials.

1.4 SUBMITTALS

A. Prior to the start of the work, prepare and submit the following items. Do not commence work activities until submittals are accepted in writing by the Engineer and Owner.

1. Work schedule two weeks prior to commencement of work.

2. Written Contractor Work Plan that summarizes the Contactor's means and methods related to the demolition, containment, management, and disposal of PCB contaminated building materials and wastes. The Work Plan must include management and disposal of PCB Bulk Product Waste materials, liquid wastes, and PCB Remediation Waste. The Work Plan must include information on how and where wastes will be stored, marked, and disposed of, and how field equipment will be decontaminated. A description of the waste load-out process and route to disposal containers shall also be included. The plan should also address personal protective equipment, worker health and safety, and decontamination procedures. The Contractor Work Plan must be reviewed and accepted by the Engineer.

3. Review of Contractor's Work Plan does not constitute approval of any specified means, methods and health and safety measures to be implemented. The review will be for general compliance with this specification and associated applicable Toxic Substance Control Act (TSCA) regulations.

4. Certification signed by the Contractor stating that the Contractor will comply with all TSCA and State of Connecticut requirements for PCB removal and disposal.

5. Health and Safety Plan specifically addressing potential hazards that may be encountered. This plan shall meet all OSHA requirements in 29 CFR 1910.120.

6. Pertinent information relating to the transportation and disposal of PCB containing materials. This includes names of transporters and disposal facilities to be used including proof of permit, license, or authorization to transport and dispose of PCB containing materials in all affected states.

B. Contract Closeout Submittals (throughout project and prior to authorization of final payment):

1. Records of the amounts of waste generated, by waste type.

2. Evidence of lawful disposal of all PCB wastes generated.

1.5 REGULATORY REQUIREMENTS

A. 40 CFR 761 as it relates to the generation, staging, labeling, removal and off-site management of PCB Bulk Product Waste (greater than or equal to 50 ppm), PCB Remediation Waste and PCB Liquid Waste.

B. Connecticut General Statue 22a-463 through 22a-469 and 40 CFR 761 as it relates to the generation, staging, labeling, removal and off-site management of PCB Waste.

C. Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this Section, including all costs, fees and taxes required or levied.

D. Comply with all applicable federal, state, and local environmental, safety and health requirements regarding the demolition of structures and other site features and recycling or disposal of demolition debris, as applicable.

E. All workers involved with PCB removal activities must be 40-hour OSHA HAZWOPER trained.

PART 2 PRODUCTS

2.1 MATERIALS

A. HEPA-Filtered Exhausts – Air inside the PCB removal work area, shall be exhausted through a High Efficiency Particulate Air (HEPA) filter.

B. Use ZEP – "Big Orange" an organic, non-petroleum, cleaner/degreaser. Big Orange by ZEP is a natural citrus solvent approved for use by EPA. This product shall be used for all final cleaning and decontamination procedures as described in Section 3.6 – DOUBLE WASH/RINSE CLEANING METHODS. The Engineer will collect PCB dust wipes on surfaces including but not limited to non-porous materials to be recycled or salvaged, contractor tools, waste containers, etc.

C. Commercially manufactured HEPA-filtered exhaust units, with specification plates intact, must be provided for each work area to attain, at a minimum, four air volume changes per hour and an inward flow of clean air into each work area at the Decontamination Facility of at least 100 feet per minute. The HEPA filter shall be preceded by replaceable pre-filters and the unit must be designed so that it cannot be operated unless all filters are in place. The purpose of the containment system is to capture fugitive particulate while removing PCB contaminated items.

D. Warning Signs and Labels - Work areas shall be properly demarcated in accordance with OSHA and TSCA requirements. The contactors specific containment approaches shall also include the following products:

1. Plastic Sheeting ("Poly") - shall polyethylene or equivalent with two layers with a thickness of at least six mil for all applications.

2. Tape and Glue – Shall be capable of sealing plastic joints and attaching plastic to finished surfaces. The bonding strength and resulting seal integrity shall not be affected by mist or water, wetting agent, or any other materials to be used in the work area.

PART 3 EXECUTION

3.1 DEMOLITION, AND REMOVAL METHODS

A. PCB Removal and Demolition activities shall be conducted in a manner that prevents the potential release of dusts to areas outside the immediate work zone.

B. Non-PCB contaminated demolition debris shall be segregated from PCB contaminated demolition debris and disposed in accordance with this Section and Section 02072 - Demolition. An additional disposal costs resulting from cross contamination of these materials caused by Contractor mismanagement will be the responsibility of the Contractor.

C. Feasible engineering controls (i.e., misters, ventilation with HEPA filtration) shall be implemented by the Contractor to minimize the possibility of contamination of areas adjacent to the work area.

D. Workers shall be informed of the building components to be removed that have been identified as containing PCBs and shall implement appropriate personal protection (respiratory, dermal, etc.)

E. PCB removal limits are dictated by the project area and scope of work for renovation/demolition activities as indicated in Architect Drawings for the project.

F. All proposed demolition and removal methods must be included in the Contractor Work Plan.

3.2 WORKER PROTECTION

A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of them. The Engineer is not responsible for health and safety procedures related to the Contractors work.

B. The Contractor shall be responsible for ensuring OSHA compliance for all personnel working with PCB items, including providing appropriate personal protective equipment and training to use such protective equipment.

C. During demolition activities, Contractor shall ensure that workers are not exposed to any listed contaminant in excess of the permissible exposure limits (PEL). If exposure cannot be reduced to or below the PEL using engineering controls or revised work practices, the Contractor shall provide the appropriate level of personal protective equipment including, but not limited to, respiratory and dermal protection.

D. Contractor personnel involved in the removal or disturbance of PCB building materials shall be advised of all hazards associated with the work.

E. Contractor is advised that certain PCB building materials may also contain asbestos. All asbestos-containing materials that contain PCBs shall also be removed and disposed in accordance with Section 13281.

F. Personal Protective Equipment shall be worn in areas where any disturbance of PCB source materials (Paint, Caulk) or contaminated substrates is performed. This includes but not limited to removal and cleaning.

G. Marking of PCB work areas and PCB storage areas shall be in accordance with 40 CFR 761.40 and RCSA 22a-463 through 22a-469.

3.3 BARRIERS AND ISOLATION AREAS

A. The Contractor shall construct and maintain suitable polyethylene barriers to isolate the work areas and to eliminate contamination of other spaces. Polyethylene barriers shall be of sufficient size and strength to prevent the migration of dust/debris from the work areas. **Two layers of 6-mil reinforced polyethylene sheeting shall be used for ALL abatement work areas. Contiguous decontamination facilities and HEPA exhausts will be utilized for ALL abatement work areas and ground surfaces.**

B. A centralized clean area adjacent to the work area(s) shall be constructed. This clean area shall be of sufficient size for workers to decontaminate personnel and equipment. Large scale removal areas shall have a contiguous decontamination (decon) unit while small scale areas may utilize a remote decon unit.

C. Barriers shall not be removed until the work areas are thoroughly cleaned and approved by Engineer.

3.4 NEGATIVE PRESSURE EXHAUST

A. Install one or more portable HEPA-filtered exhausts to maintain negative air pressure to each individual work where containment procedures are utilized.

B. The exhaust(s) must be capable of providing at least an inward velocity through any unsealed openings of at least 100 fpm, and four full air changes per hour throughout the work area.

C. All exhaust air shall pass through a HEPA filter before being discharged.

D. Exhaust system shall be operated constantly during active disturbance of PCB containing materials.

3.5 PCB REMOVAL REQUIREMENTS

A. General

1. All painted building materials, caulking, or glazing compounds to be impacted by the project must be considered to contain PCBs greater than or equal to 50 parts per million (≥50 ppm) and removed/disposed in accordance with this section. Furthermore, there are specific locations in the project area where PCB impacted concrete is known to exist and will require proper management and disposal in accordance with this section if impacted during the project.

2. The Contractor's Site Supervisor, as the OSHA Competent Person shall be at the site at all times during the performance of the work.

3. Follow all full negative pressure containment requirements as described in this Section.

4. All workers and authorized persons shall enter and leave the Regulated Area through the contiguous airlock, leaving contaminated protective clothing in the airlock for disposal of as PCB Remediation Waste. No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in the Regulated Area.

5. The Contractor shall employ methods to remove PCB contaminated materials in a manner which minimizes the generation of dust and spread of PCB contamination. The methods employed must not damage the integrity of the containment structure and shall not create a breach through which dust may escape. The Contractor shall be responsible for all costs associated with decontamination and remediation in the case of a containment breach.

6. Mechanical cutting or grinding of PCB materials is not permitted unless the equipment has factory-equipped HEPA filtered exhaust, and is done in a negative air enclosure with HEPA filtration exhaust.

7. In order to minimize the PCB concentrations inside the Regulated Area, the Contractor shall remove the materials in manageable sections. In addition, PCB materials removed from any elevated level shall be carefully lowered to the floor.

8. Paint removal using paint stripper must be done using alkaline based paint removing products. No methylene chloride products are allowed.

9. The Contractor shall promptly place the PCB Waste material in disposal containers as it is removed. Large components removed intact may be wrapped in polyethylene sheeting and secured with tape. As the disposal containers are filled, the Contractor shall promptly seal the containers, apply caution labels, and clean the containers before removal from the work area.

10. All waste containers shall be leak-tight. Containers shall be decontaminated by DOUBLE WASH METHOD (described in Section 3.6) and HEPA vacuuming prior to exiting the regulated area. Clean each container thoroughly before moving to a Waste Holding Area.

11. After completion of PCB removal work, all surfaces from which PCB materials have been removed shall be cleaned via the DOUBLE WASH METHOD and HEPA vacuumed to remove all visible material.

12. The Contractor shall properly decontaminate the exteriors of the air filtration devices, scaffolding, ladders, extension cords, hoses and other equipment inside the Regulated Area via DOUBLE WASH METHOD and HEPA vacuuming.

13. Once the Regulated Area surfaces have dried, perform a thorough post removal visual inspection. Surfaces within the Regulated Area, including but not limited to ledges, beams, and hidden locations shall be inspected by the Engineer for visible residue. Evidence of dust contamination that would be indicative of PCB contamination identified during the inspection will necessitate further cleaning as heretofore specified. The area shall be re-cleaned at the Contractor's expense, until the standard of no visible residue is achieved.

14. Prior to dismantling containments, the Engineer will perform thorough visual inspections of the remaining substrates and polyethylene sheeting enclosure for cleanliness.

B. Painted/Caulked Porous Surfaces

1. PCB painted porous surfaces to be removed are listed in Table 1. This includes paint on CMU. If additional painted porous items are to be impacted as part of the project that are not identified in Table 1 or Drawings, notify the Engineer immediately.

2. Painted porous surfaces that are assumed to contain PCBs and will be impacted by the project are to be removed and disposed as PCB Bulk Product Waste. The Contractor shall remove and dispose of the entire substrate system with the paint attached.

3.6 DOUBLE WASH/RINSE CLEANING METHODS

A. First wash. Cover the entire surface with ZEP "Big Orange" natural organic citrus solvent. Contain and collect any runoff solvent for disposal. Scrub rough surfaces with a scrub brush or disposable scrubbing pad and solvent such that each 900 cm^2 (1 square foot) of the surface is consistently wet for 1 minute. Wipe smooth surfaces with a solvent-soaked, disposable absorbent pad such that each 900 cm^2 (1 square foot) is wiped for 1 minute. Any surface <1 square foot shall also be wiped for 1 minute. Wipe, mop, and/or sorb the solvent using absorbent material until no visible traces of the solvent remain.

B. First rinse. Wet the surface with clean rinse solvent such that the entire surface is consistently wet for 1 minute. Drain and contain the solvent from the surface. Wipe the residual solvent off the drained surface using a clean, disposable, absorbent pad until no liquid is visible on the surface.

C. Second wash. Repeat the procedures in paragraph (A) of this section. The rinse solvent from the first rinse paragraph (B) of this section may be used.

D. Second rinse. Repeat the procedures in paragraph (B) of this section.

E. All liquid wastes generated from the Double Wash Method must be disposed of in accordance with 40 CFR 761.

F. All non-liquid wastes generated from the Double Wash Method (rags, swabbing material, PPE, and other solids) must be disposed of as PCB Remediation Waste.

3.7 CLEANING PROCEDURES

A. Upon completion of the removal of PCB contaminated building material in any given work area, cleaning will be performed by the Contractor. Cleaning shall be performed at the end of each work day to prevent the migration of dusts or debris to areas beyond the work limits.

B. A thorough final cleaning shall be performed on all surfaces using DOUBLE WASH METHODS and HEPA filter-equipped vacuums.

C. Final cleaning includes removal of any contaminated material, equipment or debris (including polyethylene sheeting) from the work area and removal of all visible dusts on surfaces. All polyethylene sheeting shall be packaged for disposal as a PCB Remediation Waste.

D. The Contractor shall properly decontaminate the exteriors of the air filtration devices, scaffolding, ladders, extension cords, hoses and other equipment inside the work area via the DOUBLE WASH METHOD and HEPA vacuuming.

E. Special attention shall be given to personal hygiene and cleaning of supplies and/or equipment.

F. Once the Regulated Area surfaces have dried, the Engineer will perform a thorough post removal visual inspection. Surfaces within the Regulated Area, including but not limited to ledges, beams, and hidden locations shall be inspected by the Engineer for visible residue. Evidence of dust contamination that would be indicative of PCB contamination identified during the inspection will necessitate further cleaning as heretofore specified. The area shall be re-cleaned at the Contractor's expense, until the standard of no visible residue is achieved.

G. Prior to dismantling containments, the Engineer will perform thorough visual inspections of the remaining substrates and polyethylene sheeting enclosure for cleanliness.

3.8 DECONTAMINATION OF TOOLS

A. Contractor shall decontaminate tools that may have been in contact with PCB materials. Decontamination procedures shall be in accordance with 761.79(c)(2)(i), which includes swabbing non-porous tools with a non-chlorinated organic solvent. Swabbing materials shall be disposed as a PCB Remediation Waste. Verification wipe sampling of decontaminated tools may be performed randomly by the Engineer.

B. Liquid waste from DOUBLE WASH METHOD, shower wastewater, etc. shall be disposed of at an appropriate facility to be incinerated in accordance with 40 CFR 761. Liquid waste may not be submitted to a landfill.

3.9 MANAGEMENT OF PCB WASTES

A. **All PCB waste must be removed from the site within 30 days of generation.**

B. PCB wastes generated as a result of Contractor work, shall be marked in accordance with 40 CFR 761.40; stored in a manner consistent with 40 CFR 761.65; and, disposed of in accordance with 40 CFR 761.61 or 40 CFR 761.62, unless otherwise specified below.

1. Non-liquid cleaning materials, PPE and similar materials resulting from decontamination are to be disposed of in accordance with 40 CFR 761.79(g)(6) (PCB Remediation Waste).

2. Moveable equipment, tools, and remaining surfaces in each containment shall be decontaminated in accordance with either 40 CFR 761.79(b)(3)(i)(A), 40 CFR 761.79(b)(3)(ii)(A), or 40 CFR 761.79(c)(2).

3. PCB contaminated liquids generated during decontamination (e.g. DOUBLE WASH waste liquids) shall be decontaminated in accordance with 40 CFR 761.79(b)(1) or disposed under 40 CFR 761.60.

C. In accordance with provisions of 40 CFR 761.62, the PCB Bulk Product Waste streams shall be managed in accordance with 40 CFR 761.62(a), which is generally a TSCA chemical waste/RCRA landfill or 40 CFR 762(b) which is a solid waste landfill and all such materials shall be collected, packaged and labeled by the Contractor for off-site disposal as PCB Bulk Product Waste under a bill of lading.

D. Management of PCB Bulk Product Wastes shall be in accordance with 40 CFR 761.61(b) and shall ONLY include incineration at TSCA-approved facility or disposal in a TSCA-approved chemical waste landfill. The following materials shall be collected, packaged and labeled by the Contractor for off-site disposal as a PCB Remediation Waste.

1. HEPA vacuum bags and filters containing PCB dusts/debris.

2. Respirator cartridges, scrapers, tarpaulins, suits, polyethylene sheeting and other materials used for PCB removal.

3. Decontamination and cleaning waste (i.e. rags, swabbing materials, etc)

E. The Owner will be the generator and will sign all waste profiles, bills of lading, and if appropriate and allowed under this specification, a hazardous waste manifest.

F. The Contactor is responsible for additional analytical testing via the Toxicity Characteristic Leaching Procedure (TCLP) only to support off-site disposal of PCB waste materials generated during the project

G. As further detailed throughout this Section, NO sampling/analysis by the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) for total PCBs shall be performed at any point during the performance of the work, except as specifically authorized in writing by the Owner and Engineer. The Contractor is responsible for selecting disposal facilities that can accept PCB wastes with this restriction. Only those disposal facilities that will accept waste based on TCLP may be used. If the Contractor or affiliates of the Contractor (subcontractors, subconsultants, etc.) take unauthorized samples and analyze them for total PCBs, then the contractor will be responsible for the cost of any resulting removal required under existing state and federal regulations triggered by their sampling and analysis.

E. Provide evidence that the all PCB wastes have been received at a legal disposal, recycle, reuse or salvage location. The means for such proof shall be truck weight slips/signed shipping documents from an approved disposal facility. Transport of all materials off site shall be in accordance with applicable Department of Transportation Regulations. All materials leaving the site shall become the responsibility of the Contractor.

F. When the specifications call for the measurement of PCB containing materials for unit pricing, the materials shall be segregated from other materials unless otherwise allowed in writing.

END OF SECTION