SMILEY COURT
ASBESTOS ABATEMENT
REGULATED BUILDING MATERIAL REMOVAL
AND BUILDING DEMOLITION

UNIVERSITY OF COLORADO
BOULDER, COLORADO

ENVIRONMENTAL ABATEMENT SPECIFICATIONS

Prepared by:

CTL|THOMPSON CONSULTANTS
Fort Collins, Colorado

Project No.: FC05108.024
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March 2011
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I acknowledge receipt of Addendum #__ dated ______. ___________________________ (initial)

Submitted by:

Name ___________________________________________________________ Date ____________

Signature ______________________________________________________

Company _______________________________________________________

BID FORM

Environmental Remediation
Smiley Court Children's Center
University of Colorado
Boulder, Colorado
PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The Environmental Contractor (EnvContractor) shall provide all labor, equipment, materials, and perform all necessary operations to accomplish Asbestos Abatement and Deconstruction Work covered by these Contract Documents for the Smiley Court Project at the University of Colorado at Boulder (UCB), Boulder, Colorado.

B. The Owner is University of Colorado at Boulder. The Environmental Engineer is CTL Thompson. The Air Monitoring Specialist is CTL Thompson.

C. It is required that the EnvContractor familiarize himself with the Contract Documents and have firsthand knowledge of existing conditions and limitations of the site under which the Work is to be performed. Requests for access to the site shall be made to the Owner’s Project Manager.

D. The EnvContractor is a contractor to the Owner and shall comply with all of the requirements and conditions of the Overall Contract Documents.

E. Base Bid

Abatement and Remediation

1. Remove and dispose of all friable and nonfriable asbestos materials
2. Remove and dispose of all regulated building materials

Deconstruction

1. Disconnect utilities
2. Stormwater management
3. Salvage, recycle, and reuse building materials
4. Demolition and disposal of remaining building materials
5. Demolition and disposal concrete foundations
6. Site cleanup of all visible debris
7. Regrade site

F. Alternate Bid: Not Used

1.2 CONDITIONS OF WORK

A. DISRUPTIONS: The EnvContractor shall perform his work in a manner that will minimize disruption to normal Owner’s operations. The building will not remain operational during the project.

B. AREA OF WORK: The EnvContractor shall be allowed a reasonable working area at all times. The EnvContractor shall confine his operations, including material storage, staging area and access to the site, to the area of work shown on the drawings. In order to commence the Work, coordinate with the Owner’s Project Manager.

C. SECURITY: Temporary chain link fencing shall be installed around the site and must remain closed and locked at all times unless under direct supervision of Contractor employees. All items including fencing, hoses, windows, and doors must be secured at the end of each work shift. EnvContractor shall remove temporary chain-link fencing at the end of the project.

D. REGULATIONS: The EnvContractor shall comply with all applicable Federal, State, local, and Owner’s regulations pertaining to safety, traffic control, and fire prevention. The responsibility for safety, traffic control and fire prevention lies with the selected contractor, not with the journeyman at the site.

E. WORKING HOURS: The EnvContractor’s working hours shall be between 7:00 a.m. and 6:00 p.m., with no work on weekends or holidays unless authorized. If project requires more than one shift or working at times other than those stated above, permission must be obtained from the Owner’s Project Manager at least five working days in advance.

F. ACCESS ROUTES: Only those access routes indicated on the drawings shall be used by the EnvContractor for access to the work site.

G. SPECIAL ACTIVITIES: Not Used

H. SPECIAL REQUIREMENTS:

1. The construction storage area, as shown on the drawings, will be made available to the EnvContractor near the site. The EnvContractor shall erect a sign with his name and phone number at the storage area. The area shall be kept orderly and free of litter.

2. The EnvContractor’s work areas and personnel will be restricted to designated construction areas.

3. All buildings and parking areas in the adjacent areas will be operational during the construction period.
4. The EnvContractor shall keep the fire lanes open for access around adjacent buildings and parking areas. The EnvContractor must ensure that the project staging area and construction activities do not impede emergency vehicle access to the area.

5. Recycling and/or reuse of building materials is part of this project. Recycled or reused materials must be documented and quantified.

6. After removal of the asbestos and regulated materials, moving the buildings for reuse is a potential alternative to demolition and disposal.

7. Buildings, foundations, and all surface features will be removed and properly disposed.

8. Utilities shall be disconnected and properly capped. Dead legs shall not remain on domestic water lines.

9. A stormwater management plan shall be developed and implemented. No import of materials is required. Rough final grading shall be performed and graded to capture surface runoff. Final surface stabilization is not required.

10. An approved Hot Work Permit must be obtained prior to performing any hot work activities, e.g., using heat guns, soldering, brazing, welding, grinding, powder driven studs, metal cutting using power tools or other activities involving flames or sparks. Contractors must follow procedures as outlined in the Hot Work Permit if it is required. Hot work permit forms are available from CU project managers, FM office of Planning, Design and Construction and under “Hot Work Permit” at the FLS web site: [http://www.colorado.edu/facilitiesmanagement/pdc/safety/index.html](http://www.colorado.edu/facilitiesmanagement/pdc/safety/index.html).

11. Adjacent pedestrian areas are to be protected by construction fencing or other physical barriers as necessary to ensure pedestrian safety.

### 1.3 VERIFICATION OF DIMENSIONS:

A. The EnvContractor shall be responsible for the coordination and proper relation of the work. EnvContractor shall field verify all dimensions and advise the Owner’s Project Manager of any discrepancies prior to bidding and proceeding with the work. Where exact locations are not given for the positioning of equipment and devices, they shall be positioned to permit easy access for maintenance and for removal and replacement of component parts. Commencement of the work in areas of known discrepancies shall indicate the EnvContractor’s acceptance of the conditions, and any changes resulting from said discrepancies shall be at no cost to the Owner.

### 1.4 UTILITIES

A. MAINTENANCE: The EnvContractor shall be responsible for installing and maintaining temporary cords, lines or other equipment in a safe condition.
B. REMOVAL: Prior to final acceptance, all temporary cords, lines or other equipment shall be removed.

C. DISCONNECTION: At the end of the project, the utilities shall be disconnected in accordance with requirements of UCB and the providing utility. CTL Thompson assumes no responsibility for actual conditions of existing utilities. Drawings of existing facilities are available for information only and do not necessarily reflect the actual conditions. The Contractor shall verify locations of existing utilities prior to proceeding with any work. Before starting demolition, the Contractor shall call Utility Notification System Colorado @ 811 and CU Campus Field Locator @ 303-961-0875 for utility location at or near the subject property. The Contractor shall notify utility agencies and shall arrange for disconnection of utility services as required. Verify that all appropriate services have been disconnected. The Contractor shall pay all fees and costs associated with utility disconnect, capping of lines and meter removals required for the subject property. The requirements are summarized as follows and details are provided on the drawings.

1. Water: Water lines for this project are considered service lines and are owned by the University of Colorado. Cut and cap water line with thrust block at tee on 33rd Street as shown on the drawings. Water line can be abandoned in place but all meters and piping within two feet of surface shall be removed in entirety. Right-of-way (ROW) permit should be acquired from the City of Boulder for work adjacent 33rd Street. Meters shall be salvaged and provided to UCB. Patch surface as required to match existing conditions.

2. Sewer: Sanitary sewer lines for this project are considered service lines and are owned by the University of Colorado. Plug west stub of sanitary sewer MH 1 as indicated on the drawings. MH-1 is located approximately 300 feet east of Smiley Court Children’s Center.

3. Electrical: The disconnection of electrical equipment shall be performed by a licensed electrician, prior to beginning electrical demolition. Electrical wiring in its entirety must be removed back to the transformer located north of the site as shown on the drawing. There is an existing small transformer located onsite that is the property of UCB. PCB analysis was performed on the transformer oil. The analysis picked up a small quantity of PCBs, but way below regulatory limits. This onsite transformer needs to be removed in its entirety and either disposed of or recycled by Solomon Corp or another electrical equipment recycler.

4. Natural Gas: All natural gas work including meter removal and service disconnect will be performed by Xcel Energy, but the costs for this work need to be included in this work. The natural gas shall be terminated just south of the new Biotech parking lot to the east of the site as shown on the drawings. The gas line can be abandoned in place but all meters and piping within two feet of surface shall be removed in their entirety. Coordinate with Daniel Nivel (303-245-2265) and Greg Sorter (303-245-
2279) of Xcel Energy. An application to Xcel Energy must be submitted at least six weeks prior to needing work performed.

5. Irrigation: CU records indicate that irrigation is not present on the site. If irrigation is located, irrigation pipe shall be abandoned in place. Cut and cap irrigation pipes to discontinue service. Coordinate with CU field office for removal of irrigation heads.

6. Telecom: Comcast recommends removing cable television lines back to pole or pedestal outside of demolition area. They state that last date of service is noted as 2005. A licensed electrician can remove lines back to pole or pedestal. The contact number for Comcast is 1-800-316-1619. Coordinate with Qwest and Kathy Dunbar (Qwest Senior Design Engineer) for removal and possible relocation of phone and pedestals. Work to performed by Quest via a work order placed at least six weeks prior to commencing work.

7. Boiler Piping: A boiler is located in the small mechanical building located in the middle of the Children’s Center. It is assumed that piping associated with the boiler runs underground to each of the buildings. The piping needs to be removed in its entirety. If the piping contains asbestos insulation, stop work and notify CTL Thompson.

8. Storm Sewer: Storm sewer is not present on the site. A site Storm Water Management Plan (SWMP) needs to be prepared for the site. Stormwater BMPs identified in the SWMP need to be in place prior to commencing work. At the end of the project, the site shall be graded to capture precipitation onsite and not allow runoff. Importing of materials is not required.

1.5 SCHEDULE

A. The project schedule is as follows. Asbestos abatement must be performed in the buildings prior to deconstruction. Asbestos abatement shall be performed by others.

1. Pre-bid walkthrough March 18, 2011
2. Bid submittal March 28, 2011
3. Start work April 18, 2011
4. Completion May 13, 2011

In order to closely coordinate work under this Contract, the EnvContractor shall prepare for and attend a weekly coordination meeting with the Owner and Engineer.

1.6 CONSTRUCTION SUPERINTENDENT

A. The construction superintendent shall be on the job site any time work is being conducted. The superintendent shall carry a pager or cell phone through which he can be contacted during the project. He shall make a daily construction report listing all trades, number of people, equipment utilized, work being accomplished
and any problems or unforeseen conditions encountered during the course of the work. Reports shall be provided to the Owner at the weekly coordination meeting.

B. The EnvContractor’s superintendent shall be onsite for the duration of the project at no additional charge to the project.

1.7 CRITICAL PATH CHART: Not Used

1.8 OUTAGES

A. Any utility outages necessitated by the work shall be requested in writing at least five (5) working days prior to the proposed outage. The request shall be directed to the Owner’s Project Manager and shall stipulate the specific utility systems and circuits to be affected, the location of the work, the time at which the shutdown will occur, and the duration of the outage for each system. Outages shall be kept to a minimum both in number and in duration. Where multiple outages are required, as many outages as can be accurately scheduled shall be submitted as a group.

B. Outages shall be coordinated with the Owner and may have to be performed after normal work hours at no additional charge.

1.9 TRASH REMOVAL

B. All non-salvageable items and trash shall be hauled off the Owner’s property and disposed of in accordance with applicable state and local regulations at the EnvContractor’s expense. Items shall be transported in covered or closed vehicles. Any materials dropped or blown off vehicles shall be immediately picked up and disposed of by the EnvContractor at his expense.

C. All non-salvageable items and trash shall not be stored or accumulated onsite. Materials shall be removed from the site immediately after the dumpster is full. Materials shall be kept secure and not visible or accessible to the public.

1.10 SALVAGEABLE ITEMS

A. All items removed and not to be salvaged or scheduled for reuse or recycling shall be disposed of by the EnvContractor and removed from Owner’s property. All items removed and identified for salvage shall be cleaned, transported and stored at an area provided by the Owner. The following items shall be salvaged by the EnvContractor and provided to a storage area to be determined on campus:

1. Transformer

2. Water meter

B. The following items will be substantially removed by UCB prior to work being performed by the EnvContractor in each designated Work Zone:

1. Regulated building materials
2. Classroom and office furniture: desks, tables, chairs, chalk/white boards, computers

3. Cleaning supplies

1.11 RECYCLABLE MATERIALS

A. UCB is pursuing LEED certification. The following materials shall be recycled and/or reused in compliance with LEED certification. The EnvContractor shall quantify (by weight) these materials and provide proper documentation for LEED certification.

1. Roofing shingles
2. Concrete
3. Ferrous and nonferrous metal

1.12 PARKING

A. Parking of the EnvContractor’s vehicles shall be restricted to the area shown on the drawings. Parking permits are required from the Owner for all vehicles during construction that occurs during the spring or fall semesters. The EnvContractor shall be responsible for making all parking arrangements and providing adequate signage to designate parking spaces used during construction. Parking arrangements and costs shall be included in the bid.

1.13 TRAFFIC CONTROL DEVICES: Not Used

1.14 TELEPHONE AND PAGER

A. Business Telephone: At the beginning of construction, the EnvContractor shall provide the Owner’s Project Manager with a telephone number and cell number at which the EnvContractor or his representative may be contacted 24 hours per day and 7 days per week throughout the duration of the project.

B. Construction Telephone: The EnvContractor shall have cell phone service at the project site.

1.15 FIELD OFFICE

A. The EnvContractor may provide a temporary field office on the site for their use. The location type, proposed maintenance, and other considerations, shall be approved by the Owner’s Project Manager prior to moving such a facility onto the site. At the completion of the work, the facility shall be removed from the site and the area adjacent to the office restored to that condition existing prior to the start of construction. All costs (e.g., water, sewer, phone, electricity) incurred in connection with the facility shall be borne by the EnvContractor.
1.16 SANITARY PROVISIONS

A. The EnvContractor shall provide temporary, portable toilets, and water for clean up, for use by the EnvContractor staff. The unit shall be kept in a sanitary condition at all times. In no instance shall paint or other construction materials be disposed of in the toilets or other drains, nor shall the fixtures be used for cleaning abatement equipment. All costs incurred in connection with sanitary provisions shall be borne by the EnvContractor.

1.17 PROJECT CLEANUP

A. The EnvContractor is responsible for maintaining the construction site in a clean and orderly condition from the start of the project to completion. Daily cleanups are required. The EnvContractor shall have dumpsters onsite, as required, for disposal of debris and shall arrange for transport of dumpsters and debris to and from the site.

B. At project completion, the EnvContractor shall remove all equipment, materials, and debris from the site including toilets and dumpsters. Areas around work sites shall be cleaned with dirt/grass surfaces raked clean of any debris from the EnvContractor’s operations. Remaining dirt/fill material shall be removed or may be scattered with the approval of the Owner’s Project Manager.

1.18 ASBESTOS AND OTHER HAZARDS

A. UCB shall be responsible for removal of friable asbestos materials associated with this project. Friable asbestos materials will be removed by others prior to deconstruction of the building.

B. Non-friable asbestos floor tiles and CDPHE non-regulated asbestos drywall joint compound will remain in the building and will be part of the demolition debris. EnvContractor shall not damage these materials as to render them friable. Also, construction debris shall be kept wet during demolition so as not to generate dust. EnvContractor shall be responsible for compliance with OSHA Regulations 29 CFR 1926.1101 regarding construction work where an employee may be exposed to asbestos.

C. EnvContractor shall be responsible for compliance with OSHA Regulations 29 CFR 1926.62 regarding construction work where an employee may be occupationally exposed to lead. A lead survey was conducted and lead based paint was identified in the buildings. A copy of the lead based paint survey can be obtained from the Owner. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

1. Demolition or salvage of structures where lead or materials containing lead are present.
2. New construction, alteration, repair, or renovation of structures, substrates, or portions thereof, that contain lead, or materials containing lead.

3. Transportation, disposal, storage, or containment of lead or materials containing lead on the site or location at which construction activities are performed.

1.19 EXCAVATION PERMIT: Not Used

1.20 POLLUTION ABATEMENT AND ENVIRONMENTAL PROTECTION
   A. The EnvContractor shall perform all work in a manner minimizing pollution of air, water, and land, as required.

1.21 REAL PROPERTY CHECKLIST: Not Used

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01000
SECTION 02072
DECONSTRUCTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to work of this section.

1.2 SUMMARY

A. This Section includes deconstruction of the buildings, utilities, and site improvements.

1.3 SUBMITTALS

A. Before start of work, submit the following to the Owner's Representative for review. Do not begin work until the Owner’s Representative has reviewed these submittals.

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for all materials proposed for use.

2. Schedule for demolition work by area, location, and type. Submit prior to start of work. Indicate interruption or cut-off of any utilities in the schedule.

3. Plan of Action on traffic routes

4. Methods of controlling dust

5. Compliance with asbestos and lead paint regulations

6. Stormwater Management Plan (SWMP)

7. Demolition permits from CDPHE and local agencies

8. Recycle and reuse plan showing materials to be reused or recycled, including who will be receiving materials and documentation of quantities by weight.

1.4 PROJECT AND SITE CONDITIONS

A. The Owner will not occupy portions of the building immediately adjacent to the work.

B. Notify the Owner’s Representative not less than 72 hours in advance of any demolition activities that will significantly impact the Owner’s normal operations.
C. Conditions existing at the time of bidding will be maintained by the Owner insofar as practical.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.1 PREPARATION

A. Maintain safe access to and egress from work area.

B. Provide temporary fencing, barricades, lighting, guard rails, and other forms of protection to protect the Owner’s personnel, other contractors, and the general public from injury due to the work.

C. Protect street, sidewalk, and landscaped areas from damage due to demolition operation.

D. In writing, report any existing damage to interior and/or exterior finishes, landscaping, sidewalks, structure, and equipment in the work area prior to start of demolition.

E. Implement stormwater management plan.

3.2 DEMOLITION

A. Demolish buildings in an orderly and careful manner. Apply water as required to prevent dust.

B. Remove and recycle asphalt shingles.

C. Remove and recycle ferrous and non-ferrous metal.

D. Remove and recycle concrete footings, sidewalks, and driveway.

E. Remove and dispose of existing landscaping, with the exception of trees. Tree removal will be determined on a case by case basis with the CU Landscape Architect at the pre-bid meeting.

F. Perform demolition in accordance with applicable authorities having jurisdiction.

G. If unanticipated mechanical, electrical, or structural elements which conflict with the intended function or design are encountered, immediately notify the Owner’s Representative. Pending receipt of directive from Owner’s Representative rearrange selective demolition schedule as necessary to continue overall progress without delay.
H. Repair demolition performed in excess of that required and repair all damage due to demolition at no cost to Owner.

I. Remove and dispose of all materials, equipment, and construction as indicated not to remain. Use methods and sequencing which will protect and minimize damage to existing work. Provide temporary shoring, bracing, underpinning, or other devices, as required to support existing construction, until such new construction is in place.

J. Before removing existing conduit, wiring, and piping, be sure all lines are disconnected and shut off or capped as identified in Section 01000.

K. Cease operations and notify the Owner’s Representative immediately if safety of structure appears to be endangered. Do not resume operations until safety is restored.

L. Promptly repair damages caused to adjacent structures, facilities, finishes, components, and equipment by demolition work at no cost to Owner.

M. Arrange and pay for disconnection, removal, and capping of utility services within areas of demolition.

N. Apply water to control dust resulting from demolition operations. Keep non-friable asbestos in a non-friable condition during demolition, loading, and transportation.

O. Upon the completion of work, clean the demolition area of dust and debris caused by demolition operations. No construction debris shall remain onsite. Contractor may be required to remove surficial soil in order to remove all construction debris.

P. CTL shall perform a final inspection of the site for debris prior to final grading.

Q. Final grade the site to capture surface precipitation and prevent runoff.

3.3 SALVAGE

A. Items for recycle or reuse shall be carefully marked, removed, cleaned, stored, and protected by the EnvContractor. The EnvContractor shall use skilled workers to remove such items. The Contractor shall be responsible for securing the items until turned over to the Owner in writing.

B. Items for Owner’s salvage shall be carefully marked, removed, cleaned, stored, and protected by the EnvContractor. The EnvContractor shall use skilled workers to remove such items. The Contractor shall be responsible for securing the items until turned over to the Owner in writing. The following items shall be salvaged and provided to the owner: see Section 01000, Part 1.10.

C. Items for Contractor’s salvage shall be all materials and equipment to be removed and not indicated for reuse or Owner’s salvage. Contractor’s salvage shall become property of the Contractor.
1. Items of salvable value to the Contractor may be removed from the structure as the work progresses. Salvaged items must be transported from the site as they are removed.

2. Onsite storage of removed items will not be permitted.

3.4 DISPOSAL

A. Burning of materials onsite is not permitted.

B. Remove from site contaminated or dangerous materials encountered and dispose of legally off site by safe means so as not to endanger health of workers, public, and environment.

C. All non-regulated environmental materials except for materials identified for recycling or reuse shall be disposed of at a permitted landfill. EnvContractor shall provide disposal receipts for all materials.

3.5 RECYCLING

A. Owner is obtaining LEED certification for the remodel of the building. EnvContractor is required to provide proper documentation to the Owner for recycling or reusing certain materials.

B. Items for Owner’s reuse or recycling shall be carefully marked, removed, cleaned, stored, and protected by the Contractor. The EnvContractor shall use skilled workers to remove such items. The Contractor shall be responsible for securing the items. EnvContractor shall provide documentation of proper recycling.

C. The following items shall be recycled by the EnvContractor to obtain LEED credits:

1. Roofing shingles shall be removed and delivered for recycling.

2. Ferrous and non-ferrous metal shall be removed and delivered for recycling.

3. Concrete shall be removed and delivered for recycling.

END OF SECTION 02072
SECTION 02081
ASBESTOS ABATEMENT

PART 1 – GENERAL

1.1 SUMMARY

A. The objective of the project is to remove and dispose of asbestos-containing materials (ACM) located at the Smiley Court Project at the University of Colorado at Boulder (UCB), Boulder, Colorado. UCB is performing a demolition and deconstruction of the Smiley Court Buildings and asbestos abatement must be performed prior to remodeling by the General Contractor. The Environmental Contractor (EnvContractor) will contract directly with UCB.

B. The work covered by this section includes the removal of asbestos-containing materials encountered during demolition and renovation activities associated with this project and describes procedures and equipment required to protect workers and occupants of the regulated area from contact with airborne asbestos fibers and asbestos dust and debris. The work also includes containment, storage, transportation, and disposal of the asbestos materials.

C. The asbestos removal includes
   - Floor tiles/mastic
   - Drywall Textures
   - Drywall Joint Compound
   - Sheet Vinyl
   - Sink undercoating
   - Pipe wrap

   All Work identified in these specifications shall be performed by the EnvContractor unless the task is specifically identified to be performed by the General Contractor or the Owner.

D. The EnvContractor will be required to perform general demolition, salvage, and recycling prior to performing asbestos abatement.

E. The general sequence of Work for each zone will be as follows:
   1. The Owner will provide connections in the building for electrical power, water supply, and disposal water.
   2. The Owner will remove furniture, materials, unattached equipment, etc.
   3. EnvContractor shall construct a temporary enclosure around the perimeter of the Work Area and the decontamination unit. EnvContractor shall disable existing HVAC system. EnvContractor shall install and
operate a high-efficiency particulate air (HEPA) air filtration system with negative pressure airflow. Disposal water must be filtered for asbestos.

4. EnvContractor shall install critical, primary, and/or secondary barriers in Work Area in conjunction with a HEPA air filtration system for removal of friable asbestos. EnvContractor shall remove ceiling tiles and grid as necessary to access HVAC ducts.

5. EnvContractor shall remove and dispose of asbestos, perform personal air monitoring, and fulfill other project requirements as detailed in the Contract Documents.

6. EnvContractor shall perform cleaning and decontamination operations inside the temporary enclosure.

7. Air Monitoring Specialist (AMS) will perform air monitoring outside containment during asbestos abatement. Only critical barriers will remain during aggressive air clearance.

8. Asbestos materials will not need to be replaced. Damaged areas do not require repairs. All areas shall be returned to original condition. Some finishes will not require repair as they will be renovated as part of this project. The Owner and their architectural consultant will identify finishes that do not require repair.

9. The EnvContractor shall coordinate all work with the Owner.

1.2 REFERENCES, CODES, AND REGULATIONS

A. ENVCONTRACTOR’S RESPONSIBILITY: The EnvContractor shall assume full responsibility and liability for compliance with all applicable federal, state, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The EnvContractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations. The EnvContractor shall hold the Owner, Engineer, and AMS harmless for failure to comply with any applicable Work, hauling, disposal, safety, health, or other regulation on the part of himself, his employees, or his subcontractors.

The most recently adopted codes and regulations shall be complied with.

B. FEDERAL REQUIREMENTS: Federal requirements governing asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:

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

   Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and
Actinolite; Final Rules: Title 29, Part 1910, Section 1001, Title 29, Part 1910, Section 1101 and Part 1926, Section 58 of the Code of Federal Regulations

Respiratory Protection: Title 29 Part 1910 Section 134 of the Code of Federal Regulations

Construction Industry: Title 29, Part 1926, of the Code of Federal Regulations

Access to Employee Exposure and Medical Records: Title 29, Part 1910, Section 2 of the Code of Federal Regulations

Hazard Communication: Title 29, Part 1910, Section 1200 of the Code of Federal Regulations

Specifications for Accident Prevention Signs and Tags: Title 29, Part 1910, Section 145 of the Code of Federal Regulations

2. DOT: U.S. Department of Transportation, including, but not limited to:

Hazardous Substances: Title 29, Part 171 and 172 of the Code of Federal Regulations

3. EPA: U.S. Environmental Protection Agency, including, but not limited to:

Asbestos Abatement Projects; Worker Protection Rule: Title 40, Part 763, Subpart G of the Code of Federal Regulations


Training requirements of (AHERA) Regulation: Asbestos-Containing Materials in Schools Final Rule & Notice: Title 40, Part 763, Subpart E, Appendix C of the Code of Federal Regulations


C. STATE REQUIREMENTS: State requirements governing asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:

Colorado Department of Public Health and Environment, Regulation 8, Part B, Emission Standards for Asbestos.

Colorado Department of Public Health and Environment, Regulations Pertaining to Solid Waste Disposal Sites and Facilities, Part B, Section 5.
1.3 DEFINITIONS

Adequately Wet: A term defined in 40 CFR 61, Subpart M, and EPA 340/1-90-019 meaning to sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact asbestos-containing material (ACM).

Amended Water: Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

Asbestos: Asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophylite, actinolite, and any of these minerals that have been chemically treated and/or altered.

Asbestos-Containing Material (ACM): Any material containing more than one percent (1%) asbestos.

Asbestos Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.

Authorized Person: Any person authorized by the EnvContractor and required by work duties to be present in the regulated areas.

Building Inspector: Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) “Building Inspector” training; accreditation required by 40 CFR 763, Subpart E, Appendix C and CDPHE Regulation 8.

Certified Industrial Hygienist (CIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I Asbestos Work: Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing asbestos.

Class II Asbestos Work: Activities defined by OSHA involving the removal of asbestos which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain “incidental” roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

Class III Asbestos Work: Activities defined by OSHA that involve repair and maintenance operations where asbestos, including TSI and surfacing asbestos, is likely to be disturbed. Operations may include drilling; abrading; cutting a hole; cable pulling; or crawling through tunnels, attics, or spaces above the ceiling where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.
Class IV Asbestos Work: Maintenance and custodial construction activities during which employees contact but do not disturb asbestos and activities to clean-up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where asbestos waste and debris and accompanying dust exist and cleaning up loose asbestos debris from TSI or surfacing asbestos following construction.

Clean room: An uncontaminated room having facilities for the storage of employees’ street clothing and uncontaminated materials and equipment.

Competent Person: In addition to the definition in 29 CFR 1926, Section .32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926, Section .1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) “Contractor/Supervisor” training; accreditation required by 40 CFR 763, Subpart E, Appendix C and CDPHE Regulation 8.

Contractor/Supervisor: Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan “Contractor/Supervisor” training; accreditation required by 40 CFR 763, Subpart E, Appendix C and CDPHE Regulation 8.

Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disposal Bag: A 0.15 mm, 6 mil thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926, Section .1101, used for transporting asbestos waste from containment to disposal site.

Disturbance: Activities that disrupt the matrix of asbestos, crumble or pulverize asbestos, or generate visible debris from asbestos. Disturbance includes cutting away small amounts of asbestos, no greater than the amount which can be contained in one standard sized glovebag or waste bag, not larger than 1.5 m 60 inches in length and width in order to access a building component.

Equipment Room or Area: An area adjacent to the regulated area used for the decontamination of employees and their equipment.

Employee Exposure: Exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

Fiber: A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.
**Friable asbestos:** A term defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 meaning any material which contains more than one percent (1%) asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy (PLM) that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than ten percent (10%), as determined by a method other than point counting by PLM, the asbestos content is verified by point counting using PLM.

**Glovebag:** Not more than a 1.5 by 1.5 m, 60- by 60-inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

**High-Efficiency Particulate Air (HEPA) Filter:** A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

**Homogeneous Area:** An area of surfacing material or thermal system insulation that is uniform in color and texture.

**Industrial Hygienist:** A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

**Intact:** Asbestos that has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of “intact” asphaltic, resinous, cementitious products does not render the asbestos non-intact simply by being separated into smaller pieces.

**Model Accreditation Plan (MAP):** USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763D, Subpart E, Appendix C.

**Modification:** A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system.

**Negative Exposure Assessment:** A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

**NESHAP:** National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

**Non-friable asbestos:** A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 meaning any material containing more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

**Non-friable asbestos (Category I):** A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90-018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.
Non-friable asbestos (Category II): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90-018 meaning any material, excluding Category I non-friable asbestos, containing more than 1 percent asbestos, as determined using the methods specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Permissible Exposure Limits (PELs): (1) PEL-Time weighted average (TWA): Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (fibers/cc) as an 8-hour time-weighted average (TWA), as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400. (2) PEL-Excursion Limit: An airborne concentration of asbestos not in excess of 1.0 fibers/cc of air as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400.

Regulated Area: An OSHA term defined in 29 CFR 1926, Section .1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

Removal: All operations where asbestos is taken out or stripped from structures or substrates, and include demolition operations.

Repair: Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of asbestos attached to structures or substrates. If the amount of asbestos so “disturbed” cannot be contained in one standard glovebag or waste bag, Class I precautions are required.

Spills/Emergency Cleanups: Cleanup of sizable amounts of asbestos waste and debris which has occurred, for example, when water damage occurs in a building and sizable amounts of asbestos are dislodged. A Competent Person evaluates the site and asbestos to be handled, and based on the type, condition and extent of the dislodged material, classifies the cleanup as Class I, II, or III. Only if the material was intact and the cleanup involves mere contact of asbestos, rather than disturbance, could there be a Class IV classification.

Surfacing asbestos: Asbestos-containing material which contains more than 1% asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

Thermal system insulation (TSI) asbestos: Asbestos that contains more than 1% asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation.

Transite: A generic name for asbestos cement wallboard and pipe.

Worker: Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926, Section .1101, to include EPA Model Accreditation Plan (MAP) “Worker”
training; accreditation required by 40 CFR 763, Subpart E, Appendix C, if required by the OSHA Class of work to be performed or by the state where the work is to be performed. Workers shall also be certified under CDPHE Regulation 8.

1.4 ENVIRONMENTAL PROTECTION

A. INSURANCE: EnvContractor shall procure and maintain in full force and effect at all times during the performance of the Work under this Agreement for not less than the following limits of liability, or required by law, whichever coverage is greater:

1. Workers’ Compensation:
   (a) State of Colorado................................................................. Statutory
   (b) Applicable Federal .......................................................... Statutory
   (c) Employer’s Liability ......................................................... $100,000 each accident
       $500,000 disease, policy limit
       $100,000 disease, each employee

2. Commercial General Liability (including Premise - Operations; Owner’s & Contractor’s Protective Liability; Contractual; Personal & Advertising Injury; Products & Completed Operations; Broad Form Property Damage);
   (a) Bodily Injury & Property Damage: Combined Single Limits
       General Aggregate .......................................................... $2,000,000
       Products/Completed Operations Aggregate.......................... $2,000,000
       Personal & Advertising Injury ........................................... $1,000,000
       Each Occurrence ......................................................... $1,000,000
       Fire Damage (any one fire) ............................................. $100,000
       Medical Expense (any one person) ................................... $10,000

   (b) Products and Completed Operations Insurance shall be maintained for a minimum period of three (3) years after final payment, and the Contractor shall continue to provide evidence of such coverage to the Owner on an annual basis during the aforementioned period.

   (c) Property Damage Liability Insurance shall include coverage for the following hazards:
       X (Explosion)
       X (Collapse)
       X (Underground)

3. Umbrella Excess Liability..................................................................... Not required
4. Automobile Liability ............................................................................................................ $1,000,000
   Bodily Injury & Property Damage
   Owned, Non-Owned, Hired

5. Asbestos General Liability ............................................................................................. $2,000,000
   (covered in GL Pollution per occurrence)

A certificate evidencing such insurance shall be submitted to the Owner prior to the commencement of the work. The Certificate shall name the Owner (The University of Colorado, a body corporate, acting by and through the University of Colorado at Boulder) and CTL Thompson (“Engineer” and “AMS”) as Additional Insured with respect to this project. The Certificate shall contain a provision that coverage afforded under the policies will not be cancelled, non-renewed, or modified until at least thirty (30) days prior written notice has been given to the Owner. The EnvContractor shall maintain continuous insurance coverage during the project.

Asbestos Contractor’s Liability Insurance: The EnvContractor shall add the Owner, Engineer, AMS, and Subcontractors to all insurance policies as an additional-named insured. A minimum limit of project-specific liability per occurrence of $2,000,000.

All comprehensive and general asbestos liability insurance shall be written on a project-specific, true “occurrence” basis.

B. INDEMNIFICATION

1. The EnvContractor further specifically obligates himself to the Owner in the following respects, to-wit:

   (a) to indemnify the Owner, Engineer, and AMS against and save them harmless from any and all claims, suits, liability, expense or damage for any alleged or actual infringement or violation or any patent or patent right arising in connection with this Agreement and anything done thereunder,

   (b) to indemnify the Owner, Engineer, and AMS against and save them harmless from any and all claims, suits, or liability for injuries to property, injuries to persons, including death, and from any other claims, suits or liability on account of any act or omission of the EnvContractor, or any of his officers, agents, employees or servants,

   (c) to pay for all materials furnished and work and labor performed under this Agreement, and to satisfy the Engineer thereupon whenever demand is made, and to indemnify the Owner, Engineer and AMS against and save them and the premises harmless from any and all claims, suits or liens therefore by others than the EnvContractor,
(d) to obtain and pay for all permits, licenses and official inspections made necessary by his work, and to comply with all laws, ordinances and regulations bearing on his work and the conduct thereof and,

(e) the EnvContractor warrants and guarantees the Work and materials covered by this Agreement and agrees to make good, at his own expense, any defect in materials or workmanship which may occur or develop prior to the Engineer’s release from responsibility to the Owner.

2. Further, the EnvContractor shall indemnify the Owner, Engineer, and AMS against, and save them harmless from any and all loss, damage, costs, expenses and attorneys’ fees suffered or incurred on account of any breach of the aforesaid obligations and covenants and any other provision or covenant of this Agreement.

1.5 SUBMITTALS AND PERMITS

A. SUBMITTALS: The Owner shall receive a copy of the following:

1. Plan of Action: See Section 1.8, B.

2. Asbestos design: Descriptions, detail project drawings, and site layout to include worksite containment area techniques, local exhaust ventilation system locations, decontamination and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.


4. Licenses, Permits, Notification.

5. Schedule and critical path.

6. EnvContractor Qualifications (see Section 1.8 and 1.9).

7. Colorado certification (GAC, Supervisor, Workers), Permits, Exemptions.

8. Training Program: A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees.

9. Respiratory Protection Program.

10. Medical Requirements: Physician’s written opinion.

11. MSDS: Data sheet and certificates stating that encapsulants meet the applicable specified performance requirements. MSDSs for all chemicals to be used on site. The MSDS shall be onsite.
12. Exposure Assessment and Air Monitoring: Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation.


15. Catalog: At the Owner’s request, manufacturer’s catalog data shall be submitted for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Data shall include, but shall not be limited to, the following items:

   (a) High Efficiency Filtered Air (HEPA) local exhaust equipment

   (b) Pressure differential monitor for HEPA local exhaust equipment

   (c) Respirators

   (d) Personal protective clothing and equipment: coveralls, underclothing, other work clothing, foot coverings, hard hats, eye protection, other items required and approved by Contractors Designated IH and Competent Person

   (e) Glovebag

   (f) Duct Tape

   (g) Disposal Containers

   (h) Sheet Plastic: Polyethylene Sheet – General, Polyethylene Sheet - Flame Resistant, Polyethylene Sheet – Reinforced

   (i) Wetting Agent: Amended Water, Removal encapsulant

   (j) Prefabricated Decontamination Unit

16. List of violations and/or penalties from EPA, CDPHE, DOT, or OSHA incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations) for the last three years. If there are none, a negative declaration signed by an officer of the company shall be provided.

17. A list and description of any variances.
B. PERMITS: Regulatory Notification: Submit “Notice of Intent” in writing at least ten working days prior to any Work disturbing asbestos, with a copy submitted to the Owner:

Air Quality Control Division  
Colorado Department of Public Health and Environment  
4300 Cherry Creek Drive South  
Asbestos Unit (APCD-SS-B1)  
Denver, Colorado 80246-1530

1.6 SITE CONDITIONS

A. UTILITIES: Where the EnvContractor’s operations could cause damage or inconvenience to telephone, television, power, gas, water, sewer, or existing systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the EnvContractor.

B. POTENTIAL ASBESTOS HAZARD: The disturbance or dislocation of asbestos may cause asbestos fibers to be released into the building’s atmosphere, thereby creating a potential health hazard to workmen and building occupants. Notify Owner immediately in case of any potential exposure of occupants to airborne exposure levels in excess of 0.01 fibers per cubic centimeter by PCM analysis. Apprise all workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures that must be followed.

C. ASBESTOS-CONTAINING MATERIALS: The following asbestos is known to be present at the Work site. If any other materials are found that are suspected of containing asbestos, immediately notify Owner.

- Floor tiles/mastic
- Drywall Textures
- Drywall Joint Compound
- Sheet Vinyl
- Sink undercoating
- Pipe wrap

1.7 SCHEDULING

A. The abatement work shall be performed in a continuous manner. Remobilization will not be required. Scheduling and sequencing must be coordinated with the Owner’s Project Manager and General Contractor. The remainder of the facility shall be kept operational during the abatement work. Access must be maintained to all other areas where abatement is not occurring. The EnvContractor shall submit an abatement schedule for each of the Work Areas and the proposed methods of abatement (component removal, glove bags, mini-containment, full containment, etc).
1.8 PROJECT COORDINATION

A. ADMINISTRATIVE AND SUPERVISORY PERSONNEL: General Superintendent: provide a full-time General Superintendent who is experienced in administration and supervision of asbestos abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Competent Person as required by OSHA in the latest edition of 29 CFR 1926 for the EnvContractor and is the EnvContractor’s representative responsible for compliance with all applicable federal, state, and local regulations, particularly those relating to asbestos. This person must have completed the 40-hour Contractor Supervisor course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, have had a minimum of two (2) years on-the-job training, and meet any additional requirements set forth in 29 CFR 1926 for a Competent Person. The General Superintendent is to be accredited as an asbestos abatement supervisor in accordance with the AHERA regulations 40 CFR 763, Subpart E, Appendix C and as required by the Colorado Department of Public Health and Environment (CDPHE), Regulation No. 8, Emission Standard for Asbestos. EnvContractor shall provide proof of meeting these requirements.

A. PLAN OF ACTION: EnvContractor shall submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. The Plan of Action shall include:

1. Location and details of primary barriers, temporary supports, and scaffolding.

2. Location, layout, and details or change rooms, showers, decontamination, and waste loading area.

3. Schedule and details for turning off, modifying, and sealing existing ventilation systems.

4. Location, description, and details of local negative air/exhaust ventilation systems to be used.

5. Location and connection details for all temporary utilities.

6. Location for storage of materials and equipment at the site.

7. Locations, description, and installation details of pressure differential monitoring device.

8. Locations and description of equipment of air monitoring stations.

9. Interface of trades involved in the construction and sequencing of asbestos related work.

10. A description of the material to be removed and approximate quantities.
11. A description of the method to be used to remove the asbestos-containing material.

12. A description of procedures for decontamination of HVAC systems.

13. The wetting agent to be used.

14. The post removal encapsulant/sealant to be used after removal.

15. A description of work practices to be observed by employees.

16. Decontamination procedures to be used for personnel and personal hygiene procedures.

17. A description of personal protective equipment and clothing to be worn by employees.

18. Final decontamination and cleanup procedures.

19. Waste disposal plan including a description of the method to be used to transport waste material and location of a disposal site.

20. Emergency procedure plans.

21. A list of proposed variances.

22. An asbestos design that complies with CDPHE Regulation 8 requirements.

The Engineer shall review and authorize the Plan of Action prior to commencement of Work.

C. DISCOVERY OF UNEXPECTED ASBESTOS: Suspect asbestos-containing material, which was previously inaccessible, that is discovered during demolition must be sampled and analyzed for its asbestos content. For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, the EnvContractor shall notify the Owner who will perform testing, as necessary.

1.9 ENVCONTRACTOR QUALIFICATIONS

A. WRITTEN QUALIFICATIONS AND ORGANIZATION REPORT: The EnvContractor shall furnish a written qualifications and organization report providing evidence of qualifications of the EnvContractor, EnvContractor’s Project Supervisor, Designated Competent Person, supervisors, and workers; independent testing laboratory (including name of firm, principal, and analysts who will perform analyses); all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. The report shall include an organization chart showing
the EnvContractor’s staff organization for this project by name and title, chain of command, and reporting relationship with all subcontractors.

B. SPECIFIC REQUIREMENTS: The EnvContractor shall designate, in writing, personnel meeting the following qualifications:

1. Designated Competent Person: The name, address, telephone number, and resume of the EnvContractor’s Designated Competent Person shall be provided. Evidence that the full-time Designated Competent Person is qualified in accordance with 29 CFR 1926, Sections .32 and .1101, has EPA Model Accreditation Plan (MAP) “Contractor/Supervisor” training accreditation required by 40 CFR 763, Subpart E, Appendix C, and is experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, asbestos generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, notification of other employees onsite, etc. The duties of the Competent Person shall include the following: controlling entry to and exit from the regulated area; supervising any employee exposure monitoring required by 29 CFR 1926, Section .1101; ensuring that all employees working within a regulated area wear the appropriate personal protective equipment (PPE), are trained in the use of appropriate methods of exposure control and use the hygiene facilities and decontamination procedures specified; and ensuring that engineering controls in use are in proper operating conditions and are functioning properly. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements as well as the EnvContractor’s Accident Prevention Plan and Asbestos Hazard Abatement Plan. The Designated Competent Person shall provide, and the EnvContractor shall submit, the “Contractor/Supervisor” course completion certificate and the most recent certificate for required refresher training with the employee “Certificate of Worker Acknowledgment” required by this paragraph. The EnvContractor shall submit evidence that this person has a minimum of 2 years on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

2. Project and Other Supervisors: The EnvContractor shall provide the name, address, telephone number, and resume of the Project Supervisor and other supervisors who have responsibility to implement the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, the authority to direct work performed under this contract and verify compliance, and have EPA Model Accreditation Plan (MAP) “Contractor/Supervisor” training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Project Supervisor and other supervisors shall provide, and the EnvContractor shall submit, the “Contractor/Supervisor” course completion certificate and the most recent
certificate for required refresher training with the employee “Certificate of Worker Acknowledgment” required by this paragraph. The EnvContractor shall submit evidence that the Project Supervisor has a minimum of 2 years on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of one year on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.

3. Asbestos Abatement Workers: Asbestos abatement workers shall meet the requirements contained in 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the “Certificate of Workers Acknowledgment” in this paragraph.

4. Worker Training and Certification of Worker Acknowledgment: Training documentation will be required for each employee who will perform OSHA Class I, Class II, Class III, or Class IV asbestos abatement operations. Such documentation shall be submitted on an EnvContractor generated form titled “Certificate of Workers Acknowledgment”, to be completed for each employee. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

5. Physician: The EnvContractor shall provide the name, medical qualifications, address, telephone number and resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926, Section .1101 and paragraph MEDICAL REQUIREMENTS. The physician shall be familiar with the site’s hazards and the scope of this project.

6. First Aid and CPR Trained Persons: The names of at least 2 persons who are currently trained in first aid and CPR by the American Red Cross or other approved agency shall be designated and shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Blood borne Pathogens Standard of 29 CFR 1910, Section .1030 and shall be included in the EnvContractor’s Blood borne Pathogen Program. These persons may perform other duties but shall be immediately available to render first aid when needed. A copy of each designated person’s current valid First Aid and CPR certificate shall be provided.

7. Independent Testing Laboratory: If required by the Owner, the EnvContractor shall provide the name, address, and telephone number of the independent testing laboratory selected to perform sample analyses. The testing laboratory shall be completely independent from the EnvContractor as recognized by federal, state, or local regulations.
Written verification of the following criteria, signed by the testing laboratory principal and the EnvContractor, shall be submitted:

(a) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, the most current version of NIOSH Pub No. 84-100 Method 7400, and NIOSH Pub No. 84-100 Method 7402, transmission electron microscopy (TEM); the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in a Proficiency Analytical Testing (PAT) Program; the names of the selected microscopists who will analyze airborne samples by PCM with verified documentation of their proficiency to conduct PCM analyses by being judged proficient in counting samples as current participating analysts in the PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent) with a copy of course completion certificate provided; when the PCM analysis is to be conducted onsite, documentation shall be provided certifying that the onsite analyst meets the same requirements.

(b) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect asbestos bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts (names shall be provided) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

(c) Transmission electron microscopy (TEM): The laboratory is fully equipped and proficient in conducting TEM analysis of airborne samples using the mandatory method specified by 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for airborne sample analysis of asbestos by TEM; the laboratory will use analysts (names shall be provided) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM.

(d) PCM/TEM: The laboratory is fully equipped and each analyst (name shall be provided) possesses demonstrated proficiency in conducting PCM and TEM analysis of airborne samples using NIOSH Pub No. 84-100 Method 7400 PCM and NIOSH Pub No. 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

8. Disposal Facility, Transporter: The EnvContractor shall provide written evidence that the landfill to be used is approved for asbestos disposal by
the USEPA and state and local regulatory agencies. Copies of signed agreements between the EnvContractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste generated during the performance of this contract shall be provided. Qualifications shall be provided for each subcontractor or transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos. The EnvContractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61, Section .150(b), and other applicable state or local requirements.

C. FEDERAL, STATE, OR LOCAL CITATIONS ON PREVIOUS PROJECTS: The EnvContractor and all subcontractors shall submit a statement, signed by an officer of the company, containing a record of any citations issued by federal, state or local regulatory agencies relating to asbestos activities (including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations) for the last three years. If there are none, a negative declaration signed by an officer of the company shall be provided.

1.10 HEALTH AND SAFETY

A. GENERAL TRAINING REQUIREMENTS: The EnvContractor shall establish a training program as specified by EPA Model Accreditation Plan (MAP), training requirements at 40 CFR 763, Subpart E, Appendix C, the State of Colorado Regulation 8 Air Quality Control Division, OSHA requirements at 29 CFR 1926, Section .1101(k)(9), and this specification. EnvContractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the Owner as specified in paragraph QUALIFICATIONS.

B. PROJECT SPECIFIC TRAINING: Prior to commencement of work, each worker shall be instructed in the following project specific training:

1. The hazards and health effects of the specific types of asbestos to be abated;

2. The content and requirements of the EnvContractor’s Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses and site-specific safety and health precautions;

3. Hazard Communication Program;

4. Hands-on training for each asbestos abatement technique to be employed;
5. Heat and/or cold stress monitoring specific to this project;

6. Air monitoring program and procedures;

7. Medical surveillance to include medical and exposure record-keeping procedures;

8. The association of cigarette smoke and asbestos-related disease;

9. Security procedures;

10. Specific work practice controls and engineering controls required for each Class of work in accordance with 29 CFR 1926, Section 1101.

C. HAZARD COMMUNICATION PROGRAM: A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section .59. Material Safety Data Sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Owner and one copy shall be included in the EnvContractor's Hazard Communication Program.

D. EATING AREAS: The EnvContractor shall provide eating areas in which the airborne concentrations of asbestos are below 0.01 f/cc.

E. SMOKING: Smoking is not permitted on site.

1.11 VARIANCES

A. Any variances to these specifications and any environmental regulations shall first be approved by the Owner and Engineer prior to submittal to the regulatory agency. If approved by the Owner, a variance request shall be submitted and approved by the appropriate regulating agency(s) prior to implementation.

PART 2 – PRODUCTS

2.1 GENERAL

A. DELIVERY: Deliver all materials in the original packages, containers or bundles bearing the name of the manufacturer and the brand name.

B. STORAGE: Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

C. PROTECTION: Damaged or deteriorating materials shall not be used and shall be removed from the premises. Materials that become contaminated with asbestos shall be disposed of in accordance with applicable regulations.
2.2 ENCAPSULANTS

A. ALL ENCAPSULANTS: Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

1. Flame Spread - 25, ASTM E 84.
3. Accelerated Aging Test Permeability, Min. 23 ng per ASTM E 96 Pa-sec-square m.

B. ADDITIONAL REQUIREMENTS FOR BRIDGING ENCAPSULANT

1. Cohesion/Adhesion Test, ASTM E 736 730 N/m. Fire Resistance, Negligible ASTM E 119 affect on fire resistance rating over three hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing). Impact Resistance, Min. ASTM D 2794, 43 inch-lb (Gardner Impact Test). Flexibility: rupture or ASTM D 522 cracking (Mandrel Bend Test).

B. ADDITIONAL REQUIREMENTS FOR PENETRATING ENCAPSULANT

1. Cohesion/Adhesion Test, ASTM E 736 730 N/m. Fire Resistance, Negligible ASTM E 119 affect on fire resistance rating over three hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing). Impact Resistance, Min. ASTM D 2794, 43-inch-lb (Gardner Impact Test). Flexibility, no rupture or ASTM D 522 cracking (Mandrel Bend Test).

2. ADDITIONAL REQUIREMENTS FOR LOCKDOWN ENCAPSULANT: Fire Resistance, Negligible ASTM E 119 affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member) Bond Strength, 1.5 kN/m ASTM E 736 (Tests compatibility with cementitious and fibrous fireproofing).

2.3 TOOLS AND EQUIPMENT

A. GLOVEBAG: Glovebags shall be provided as described in 29 CFR 1926, Section .1101. The glovebag assembly shall be 0.15 mm 6-mil thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

B. DUCT TAPE: Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container shall be provided.

C. DISPOSAL BAGS: Leak-tight bags, 0.15 mm 6-mil thick, shall be provided for placement of asbestos generated waste.
D. **SHEET PLASTIC:** Sheet plastic shall be polyethylene of 4 mil or 6 mil minimum thickness depending on location and shall be provided in the largest sheet size necessary to minimize seams, as indicated on the project drawings.

E. **REINFORCED PLASTIC:** Reinforced plastic sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film with a minimum thickness of 10 mil.

F. **FIRE-RATED PLASTIC:** Fire-rated plastic shall be polyethylene of 4 mil or 6-mil minimum thickness. The plastic shall be flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films.

G. **AMENDED WATER:** Amended water shall meet the requirements of ASTM D 1331.

H. **MASTIC REMOVING SOLVENT:** Mastic removing solvent shall be nonflammable, low odor, and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used on site shall have a flash point greater than 60 degrees C to 140 degrees Fahrenheit.

I. **LEAK-TIGHT WRAPPING:** Two layers of 6 mil minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags. Upon placement of the asbestos component or material, each layer shall be individually leak-tight sealed with duct tape.

J. **WETTING AGENTS:** Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the asbestos and retarding fiber release during disturbance of the asbestos greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

K. **MISCELLANEOUS ITEMS:** A sufficient quantity of other items shall be provided, such as but not limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of containments, UL approved temporary electrical equipment, material and cords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc.

L. **SCAFFOLDING:** Scaffolding shall meet all applicable safety regulations.
M. AIR PURIFYING EQUIPMENT: Air purifying equipment shall consist of high efficiency particulate air (HEPA) filtration systems. The equipment shall be capable of at least 1800 CFM under load and shall have at least two stages of pre-filtration ahead of the HEPA final filter. It shall be equipped with an elapsed time indicator (hour meter), static pressure gauge with low flow alarm, and be overloaded protected.

N. MANOMETER: A manometer shall be capable of measuring the differential air pressure between the work area and clean area with a minimum detection of – 0.01 inches of water and shall have a recording device.

PART 3 – EXECUTION

3.1 DIFFERENTIAL AIR PRESSURE SYSTEM

A. EnvContractor shall submit layout of HEPA air filtration system to the Owner and Engineer for review. Include in the submittal at a minimum:

1. The number of negative air machines required and the calculations necessary to produce a negative air flow.

2. Description on how to maintain negative airflow through containment.

3. The location of the machines in the workspace.

B. Isolate the Work Area from all adjacent areas or systems of the building with a negative air pressure system that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area. Turn off and isolate all existing HVAC systems.

C. Provide a fully operational differential air pressure system within the Work Area maintaining continuously a pressure differential across the Work Area enclosure of 0.02 inches of water at all times. If differential air pressure drops below 0.02 inches of water, all abatement work shall stop until problem is corrected and the Owner shall be immediately notified.

D. Continuously monitor and record the pressure differential with a calibrated monitoring device incorporating a strip chart recorder. All strip charts shall be submitted to the Owner at the end of each week.

E. Determining the Ventilation Requirements: Provide fully operational differential air pressure systems supplying a minimum of one air change every 15 minutes.

3.2 TEMPORARY ENCLOSURES

A. SETUP: Floors, walls, and equipment shall be pre-cleaned with amended water or HEPA-vacuumed prior to installing any poly if visible dust or debris is present.

Remove all uncontaminated equipment and/or supplies from the Work Area before commencing Work or completely cover with one layer of polyethylene
sheeting at least 6 mil in thickness securely taped in place with duct tape. Such equipment shall be considered outside the Work Area unless covering plastic or seal is breached.

Disable ventilating systems or any other system bringing air into or out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means that will prevent accidental premature restarting of equipment.

Provide emergency exits and emergency lighting. Permit access to the Work Area only through the Decontamination Unit. All other means of access shall be posted, closed off, and sealed.

Completely separate the Work Area from other portions of the building and the outside by sheet plastic barriers (critical barriers) at least 6 mil in thickness or by sealing cracks leading out of Work Area with duct tape.

B. CRITICAL BARRIERS: Critical barriers are required during removal of all friable and non-friable materials. Individually seal all ventilation openings (supply and exhaust), lights, clocks, doorways, windows, convectors and speakers and other openings into the Work Area with duct tape alone or with polyethylene sheeting at least 6 mil in thickness taped securely in place with duct tape or spray cement. Maintain seal until all Work, including Project Decontamination, is completed.

C. PRIMARY AND SECONDARY BARRIERS: Primary and secondary barriers are required during removal of all friable materials. Cover floor of Work Area with one individual layer of clear polyethylene sheeting at least 6 mil in thickness and turned up at walls at least 12 inches. Cover all walls in Work Area, including “Critical Barrier” sheet plastic barriers, with one layer of polyethylene sheeting at least 4 mil in thickness, mechanically supported and sealed with duct tape or spray glue in the same manner as “Critical Barrier” sheet plastic barriers. Tape all joints, including the joining with the floor covering, with duct tape.

D. VIEW PORT: A clear view port with a minimum size of 12-inch by 12-inch shall be installed to allow a view of the interior of the entire Work Area. If the entire Work Area cannot be viewed from a single port, multiple view ports shall be installed.

E. WARNING SIGNS: Warning signs and tape printed in English shall be provided at the regulated boundaries and entrances to regulated areas. The EnvContractor shall ensure that all personnel working in areas contiguous to regulated areas comprehend the warning signs. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs displaying the following legend shall be provided:
DANGER
ASBESTOS CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

"Respirators and Protective Clothing Are Required In this Area" will be added to the warning sign when protective equipment is required.

3.3 WORKER PROTECTION

A. WORKER TRAINING

1. All workers are to be accredited as Abatement Workers as required by the AHERA regulation 40 CFR 763 Appendix C to Subpart E and the CDPHE Regulation 8. The EnvContractor shall obtain a General Asbestos Certification from CDPHE. All workers are to be trained, certified, and accredited as required by state or local code or regulation.

2. Train, in accordance with 29 CFR 1926 and 29 CFR 1910.1001, all workers in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. Provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 f/cc or greater for an 8-hour TWA.

3. Submit copies of certificates for the EnvContractor and each worker as evidence that each asbestos Abatement Worker is accredited.

B. PROTECTIVE CLOTHING

1. Provide respirators, disposable full-body coveralls, and disposable head covers and require that they be worn by all workers in the Work Area. Provide a sufficient number of all required changes for all workers in the Work Area.

2. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Rubber boots shall be used in moist or wet areas. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as asbestos waste.

Disposable protective foot covering shall be disposed of as asbestos waste. If rubber boots are not used, disposable foot covering shall be provided.

3. Eye protection provided shall be in accordance with ANSI Z87.1.

3.4 RESPIRATORY PROTECTION

A. RESPIRATORY PROTECTION PROGRAM: Submit level of respiratory protection intended for each operation required by the project.
B. RESPIRATOR BODIES: Provide half-face or full-face type respirators. Equip full-face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit.

C. FILTER CARTRIDGES: Provide, at a minimum, HEPA-type filters labeled with NIOSH and MSHA certification for “Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-containing Dusts and Mists” and color coded in accordance with ANSI Z228.2 (1980). Do not use single use, disposable, or quarter-face respirators.

D. WHEN REQUIRED: Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos, whether intentional or accidental. Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation that could cause airborne fibers until the area has been cleared for re-occupancy. Respirators shall be used in the following circumstances as defined by OSHA:

1. During all Class I asbestos jobs.
2. During all Class II work where the asbestos is not removed in a substantially intact state.
3. During all Class II and III work that is not performed using wet methods.
4. During all Class II and III asbestos jobs where the EnvContractor does not produce a negative exposure assessment.
5. During all Class III jobs where TSI or surfacing asbestos is being disturbed.
6. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
7. During all work where employees are exposed above the PEL-TWA or PEL-Excursion Limit.
8. In emergencies.

E. EXPOSURE LIMITS: Eight-hour Time Weighted Average (TWA) of asbestos fibers to which any worker may be exposed shall not exceed 0.1-fibers/cubic centimeter. Excursion levels of asbestos fibers to which any worker may be exposed shall not exceed 1.0 fibers/cubic centimeter. In areas where solvents will be used to remove mastic, organic cartridges shall be used in conjunction with HEPA filters.

F. MEDICAL: Medical requirements shall conform to 29 CFR 1926, Section 1101.

G. RESPIRATORY FIT TESTING: A qualitative or quantitative fit test conforming to 29 CFR 1926, Section 1101, Appendix C shall be conducted by the EnvContractor's Designated IH for each EnvContractor worker required to wear a
respirator, and for the Owner and authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed for each worker wearing a negative-pressure respirator prior to initially wearing a respirator on this project and every 6 months thereafter. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendation.

3.5 DECONTAMINATION UNITS

A. PERSONNEL DECONTAMINATION UNIT: Provide separate personnel decontamination and load out facilities. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the load out unit.

Provide a three-stage Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces consisting of a changing room, shower room, and equipment room. All flaps/doors shall be self-closing. Require all persons, without exception, to pass through this decontamination unit for entry into and exiting from the Work Area for any purpose.

Require workers to remove all street clothes in this room, dress in clean disposable coveralls, and don respiratory protection equipment. Do not allow asbestos-contaminated items to enter this room. Require workers to enter this room either from outside the structure dressed in street clothes or naked from the showers.

Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the changing room or for showering by workers headed out of the Work Area after undressing in the equipment room. Require work equipment, footwear, and additional contaminated work clothing to be left in equipment room.

Pump wastewater to drain or to storage for use in amended water. If pumped to drain, provide 20-micron and 5-micron wastewater filters in line to drain or wastewater storage. Change filters daily or more often if necessary.

B. LOAD-OUT UNIT: A two-stage temporary load-out unit that is adjacent and connected to the work area shall be provided. Utilization of prefabricated units shall have prior approval of the Owner. The load-out unit shall be attached in a leak-tight manner to each regulated area. Surfaces of the load-out unit and access tunnel shall be adequately wet-wiped two (2) times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

C. REMOTE SHOWER: A remote shower may be used for glovebags with secondary containment or unit component removal areas with secondary containment provided workers double suit and drop the outer suit in the secondary containment or mini-containment when exiting containment and proceed immediately to the shower for decontamination.
3.6 WORK AREA DECONTAMINATION

A. PRIOR WORK: During completion of the asbestos abatement work, the secondary barrier of polyethylene sheeting (if required) will have been removed and disposed of, along with any gross debris generated by the asbestos abatement work.

B. START OF CLEANING: Work of this section begins with the cleaning of the primary barrier. At start of Work, the following will be in place:

1. Primary Barrier: One layer of polyethylene sheeting on floor and one layer on walls.
2. Critical Barrier that forms the sole barrier between the Work Area and other portions of the building or the outside.
3. Critical Barrier sheeting over clocks, ventilation openings, doorways, convectors, speakers, and other openings.
4. Decontamination Units: for personnel and equipment in operating condition.

C. CLEANING: Carry out a first cleaning of all surfaces of the Work Area, including items of remaining sheeting, tools, scaffolding and/or staging by use of damp cleaning and mopping and/or a HEPA filtered vacuum. Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.

D. VISUAL INSPECTION: EnvContractor shall perform a Complete Visual Inspection of the entire Work Area, including decontamination unit, all plastic sheeting, seals over ventilation openings, lights, doorways, windows, and other openings; look for debris from any sources, residue on surfaces, dust or other matter. If any such debris, residue, dust, or other matter is found, repeat cleaning and continue decontamination procedure from that point.

AMS shall perform a Visual Inspection of the entire Work Area prior to determine that all asbestos material has been removed and properly disposed. If any debris, residue, dust, or other material is found, EnvContractor shall perform a thorough re-cleaning of the entire area.

E. LOCKDOWN OF SUBSTRATE: After successful inspection by AMS, EnvContractor shall perform lockdown of substrate where required. Maintain negative HEPA air filtration system in operation during Work. Immediately following the lockdown, remove all primary barrier sheeting leaving only:

1. Critical Barrier: which forms the sole barrier between the Work Area and other portions of the building or the outside.
2. Critical Barrier Sheeting: over clocks, ventilation openings, doorways, convectors, speakers and other openings.

3. Decontamination Unit: for personnel in operating condition.


F. WORK AREA AIR CLEARANCE: After the Work Area is found to be visually clean and lockdown is thoroughly dry, AMS shall perform “aggressive air sampling” for work area clearance according to Section 3.7. Surfaces inside the area shall be aggressive agitated by forced air. Fans shall be placed in the work area to keep fibers airborne.

G. TEAR DOWN: After Work Area Air Clearance requirements have been met:

1. Shut down and remove the HEPA air filtration system.

2. Remove Personnel Decontamination Unit.

3. Remove the critical barriers separating the Work Area from the rest of the building.

4. Remove all equipment, materials, and debris from the work site.

5. Dispose of all asbestos-containing waste material as specified.

3.7 AIR MONITORING AND WORK AREA CLEARANCES

A. WORK AREA ISOLATION:

1. Air monitoring shall be performed to provide at least the following samples during the asbestos abatement. All samples shall be taken while work is in progress, except during final cleanup. Area air-sampling procedures shall meet EPA 560/5-85-024 using the PCM method. An independent AMS shall perform work air monitoring.

2. The AMS may collect area air samples in the following locations during active abatement:
   (a) Outside building at HEPA exhaust during removal
   (b) In clean room outside of shower unit
   (c) In adjoining areas occupied by the public

3. If any air sample taken outside of the Work Area exceeds 0.01 fibers per cubic centimeter, immediately and automatically stop all Work. Determine the cause of the elevated fiber concentrations and correct the problem. EnvContractor shall treat the affected area as an asbestos spill and respond according to the regulatory requirements for an asbestos spill.
4. If any air sample taken inside the Work Area exceeds 1.0 fiber per cubic centimeter, a confirmation asbestos air sample shall be taken immediately. If the confirmation sample exceeds the 1.0 fibers/cc, the EnvContractor shall automatically stop all Work, clean the Work Area and collect another inside air sample. If three inside air samples exceed 1.0 fiber/cc, then the respiratory protection equipment shall be upgraded to provide appropriate protection.

B. PERSONAL MONITORING: The EnvContractor shall also perform air monitoring as required to meet OSHA requirements for maintenance of Time Weighted Average (TWA) and Excursion fiber counts for types of respiratory protection provided.

C. WORK AREA CLEARANCE: Work Area Clearance will not begin until the visual inspection is complete and has been cleared by the AMS and lockdown is thoroughly dry.

1. Aggressive Sampling: Aggressive sampling will occur with only the critical barriers in place. All secondary and primary barriers shall be removed. Before sampling pumps are started, the exhaust from forced-air equipment (leaf blower with an approximately one horsepower electric motor) will be swept against all walls, ceilings, floors, ledges, and other surfaces in the room. This procedure will be continued for five minutes per 1,000 square feet of room area.

   One 20-inch-diameter fan per 10,000 cubic feet of room volume will be mounted in a central location, directed toward ceiling and walls and operated at low speed for the entire period of sample collection.

2. PCM Analysis: The number and volume of PCM air samples taken will be in accordance with the schedule below. Fibers on each filter will be measured using the NIOSH Method 7400 entitled “Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement. When PCM is used for clearance analysis, the release criteria for each of the five work area samples shall not exceed 0.01 fibers per cubic centimeter.

<table>
<thead>
<tr>
<th>Location Sampled</th>
<th>No. of Samples</th>
<th>Analysis Method</th>
<th>Analytical Sensitivity (Fibers/cc)</th>
<th>Recommended Volume (Liters)</th>
<th>Rate (LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Work Area</td>
<td>5</td>
<td>PCM</td>
<td>0.01</td>
<td>1,800</td>
<td>1 – 16</td>
</tr>
<tr>
<td>Work Area Blank</td>
<td>2 or 10%</td>
<td>PCM</td>
<td>0.01</td>
<td>0</td>
<td>Open for 30 seconds</td>
</tr>
<tr>
<td>Mini-containment</td>
<td>2</td>
<td>PCM</td>
<td>0.01</td>
<td>1,800</td>
<td>1 – 16</td>
</tr>
</tbody>
</table>
3. TEM Analysis: For TEM, a minimum of 13 samples will be taken and analyzed as follows. Analysis will be performed using the analysis method set forth in the AHERA Regulation 40 CFR 763 Appendix A. Decontamination of the work site is complete if all Work Area sample volumes are greater than 1,199 liters for a 25-mm sampling cassette or 2,799 liters for a 37-mm sampling cassette, and the TEM average concentration of asbestos does not exceed the filter background level of 70 structures per square millimeter of filter area.

<table>
<thead>
<tr>
<th>Location Sampled</th>
<th>No. of Samples</th>
<th>Analysis Method</th>
<th>Analytical Sensitivity (Fibers/cc)</th>
<th>Recommended Volume (Liters)</th>
<th>Rate (LPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each Work Area</td>
<td>5</td>
<td>TEM</td>
<td>0.005</td>
<td>1,800</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Outside Each Work Area</td>
<td>5</td>
<td>TEM</td>
<td>0.005</td>
<td>1,800</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Work Area Blank</td>
<td>1</td>
<td>TEM</td>
<td>0.005</td>
<td>0</td>
<td>Open for 30 seconds</td>
</tr>
<tr>
<td>Outside Blanks</td>
<td>1</td>
<td>TEM</td>
<td>0.005</td>
<td>0</td>
<td>Open for 30 seconds</td>
</tr>
<tr>
<td>Sealed blank</td>
<td>1</td>
<td>TEM</td>
<td>0.005</td>
<td>0</td>
<td>Not open</td>
</tr>
</tbody>
</table>


D. Laboratory Testing: The AMS will perform PCM laboratory analysis of the outside work samples and clearance area air samples using NIOSH Method 7400. PCM area work samples will be reported within 24 hours. TEM Analysis will be performed using the analysis method set forth in the AHERA Regulation 40 CFR 763 Appendix A.

E. Documentation: A complete record of all air monitoring tests and results will be furnished to the Owner. Documentation of air sampling shall include at a minimum:

1. Calculations of minimum volume to achieve necessary detection limits
2. Sampling times
3. Sampling location with drawings of area
4. Inspection of sampling equipment
5. Documentation of pre- and post-calibration of sampling equipment
6. Description of work conditions
7. Comments on unusual conditions at the work site
F. COSTS: Owner shall pay the costs for Work Area and initial air clearance sampling. Owner shall pay for air monitoring using an independent Air Monitoring Specialist (AMS) meeting the requirements of CDPHE Regulation 8. The EnvContractor shall pay the costs for performing air monitoring for personnel monitoring. The EnvContractor shall pay (labor, analysis, expenses) for any subsequent air clearance sampling that fails initial air clearance monitoring.

3.8 NON-ASBESTOS DEMOLITION

A. Certain non-asbestos building materials (i.e. ceiling tiles/grid, carpeting, drywall walls, block walls, plaster) may be required to be removed to access asbestos materials or as part of the remodeling. Non-asbestos building materials that are not contaminated with asbestos may be stored, transported and disposed as general construction debris. Non-asbestos demolition shall be performed prior to disturbing asbestos materials.

If asbestos materials are disturbed during non-asbestos demolition, immediately contain the work area and then proceed with asbestos cleanup and air monitoring as required for an asbestos spill.

3.9 ENCAPSULATION OF ASBESTOS-CONTAINING MATERIALS

A. PENETRATING ENCAPSULATION: Before penetrating encapsulation is applied, asbestos removal work in the area shall be complete and the surfaces to be encapsulated shall be free of loose or damaged material. Substrate shall be evaluated before application to ensure that the encapsulant will not cause the substrate to fail in any way.

Two coats of encapsulant shall be applied with each coat having a different color to help determine coverage.

3.10 REMOVAL OF FRIABLE ASBESTOS-CONTAINING/CONTAMINATED MATERIALS

A. SPRAY-ON AND TEXTURE ON SUBSTRATE: ASBESTOS SPRAY-ON CEILING MATERIAL AND OVERSPRAY. The asbestos spray-on or texture material and overspray is regulated by EPA, CDPHE, and OSHA. Removal must be performed using a full-containment enclosure system with a negative air system. The spray-on ceiling material is located on the ceilings and may be found in overspray on some of the adjoining walls. The asbestos spray-on or texture material is located on both concrete and drywall substrate.

Spray asbestos-containing ceiling texture, texture, and overspray with a fine mist of amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate materials to substrate. Do not over-saturate to cause excess dripping. If located on concrete, scrape asbestos materials from substrate. Remove residue remaining on substrate after scraping by using a stiff nylon bristled hand brush. Pay particular attention to areas where acoustical ceiling spray overspray may be located and between tee joints, around walls, and electrical sockets.
If asbestos is located on removable substrate (drywall, fiberboard), remove asbestos spray-on materials and underlying substrate (fiberboard, drywall). Exposed studs may be removed as asbestos contaminated debris or cleaned and left in place.

Clean overspray on walls and equipment. Remove materials in manageable quantities and control the descent to staging or floor below. If using amended water, spray surface continuously during work process. If using removal encapsulant, follow manufacturer's written instructions.

Remove saturated asbestos materials in small sections from all areas. Do not allow material to dry. Do not use power washing for gross removal. Power washing may be used for final cleaning if wash water is adequately controlled and not allowed to pool or be released from the area. At their discretion, the AMS, Engineer and/or Owner has the authority to stop the use of power washing if not adequately controlled at no additional costs to the Owner.

Mist Work Area continuously with amended water whenever necessary to reduce airborne fiber levels.

As material is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over, and seal with minimum of three wraps of duct tape. Clean outside of bag and move to wash down area adjacent to Decontamination Unit.

After removal of asbestos materials, proceed with decontamination and final inspection and testing of the Work Area as specified elsewhere.

B. THERMAL SYSTEM INSULATION: BOILER INSULATION, GASKETS, BOARDS, FLUE, TANK INSULATION, PIPE FITTINGS: Not used

C. CONTAMINATED SOIL: Not used.

D. ASBESTOS DRYWALL JOINT COMPOUND:

Applicable Regulation: The asbestos drywall joint compound is an OSHA regulated asbestos material. The composite material of drywall joint compound, tape, and drywall is not regulated by CDPHE or EPA. Drywall joint compound shall be removed as an OSHA Class II asbestos material. Where practical, remove drywall joint compound prior to disturbing other asbestos material. Asbestos drywall joint compound and non-asbestos drywall can be disposed of as non-asbestos materials, if the material is removed as a composite material prior to other asbestos abatement.

Removal Procedures:
1. If the drywall joint compound is part of removing another type of asbestos material, the more stringent containment and controls shall apply.

2. Remove drywall joint compound as shown on Drawings and in accordance with these specifications. The drywall joint compound is a regulated material by OSHA 1926.1101. The drywall joint compound and
attached drywall (non-asbestos) shall be removed from existing stud walls and ceiling. Work shall be performed using critical barriers, a drop cloth, and negative air flow through a HEPA filter.

3. The work zone shall be secured against entry by any unauthorized or untrained persons throughout the Work. Post warning signs and erect temporary barricades.

4. Remove drywall joint compound and drywall so that it does not become friable during removal.

5. Spray drywall with a fine mist of amended water or removal encapsulant. Thoroughly wet asbestos-containing materials to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for water or removal encapsulant to penetrate material thoroughly.

6. Perforate outer covering of any drywall that has been painted and/or covered in order to allow penetration of amended water or removal encapsulant or, where necessary, carefully strip away while simultaneously spraying amended water or removal encapsulant on the installation to minimize dispersal of asbestos fibers into the air.

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

8. Remove saturated asbestos-containing material in small sections from all areas. Do not allow material to dry out. As it is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over and seal with minimum three wraps of duct tape. Clean outside and move to washdown station adjacent to material decontamination unit.

9. After removal of drywall joint compound and drywall, proceed with decontamination and final inspection and testing of the Work Area as specified elsewhere in this section.

10. No replacement is required.

11. Material may be disposed as non-asbestos debris.

E. ASBESTOS CEILING TILE: Not used

F. ASBESTOS SHEET VINYL:

EnvContractor shall install a full containment enclosure with a negative air filtration system. Remove asbestos sheet vinyl. Thoroughly wet the material with fine mist of amended water or removal encapsulant. Allow adequate time for amended water or removal encapsulant to saturate material.
Remove materials in manageable quantities. Protect and clean all electrical wires, conduits, telecommunications, and other utilities. Do not allow material to dry. Mist Work Area continuously with amended water whenever necessary to reduce airborne fiber levels.

As material is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over, and seal with minimum of three wraps of duct tape. Clean outside of bag and move to wash down area adjacent to Decontamination Unit.

After removal of asbestos materials, proceed with decontamination and final inspection and testing of the Work Area as specified elsewhere.

EnvContractor shall clean all areas above the ceiling and the entire work zone. Work Zone shall be free from dust and debris.

G. GENERAL ABATEMENT PRACTICES: Do not allow asbestos materials to dry out. Mist Work Area continuously with amended water whenever necessary to reduce airborne fiber counts.

Damaged or deteriorated areas shall be repaired or replaced as necessary to the approval of the Owner. Pre-existing conditions shall be recorded and a list submitted to the Owner prior to starting Work. Areas damaged by the removal Work shall be repaired to a “like-new” condition unless identified as future demolition work (Coordinate with Owner).

H. CLEARANCE: Clean all surfaces inside the full containment. No dust or debris shall be present. Request AMS to perform a visual inspection. Apply encapsulant and allow to thoroughly dry. Request AMS to perform an aggressive clearance testing of the full containment area shall be performed.

I. PERSONAL PROTECTION: Workers shall comply with Section 3.3 Worker Protection, Section 3.4 Respiratory Protection, and Section 3.5 Decontamination Units.

3.11 GLOVEBAG TECHNIQUE

A. MATERIALS: The glovebag shall consist of a minimum of 6 mil polyethylene plastic with two sealed in water projecting gloves equipped with a pouch for storage of tools and sufficient capacity to hold removed materials and to permit sealing as required. The glovebag shall be seamless on the bottom.

B. INSTALLATION: The glovebag technique shall be used only inside a secondary containment; negative air flow is required inside the secondary containment. The secondary containment shall take the configuration of a typical isolation area with one layer of poly. The containment is not required to have a worker decontamination system. Remove overlying materials (drywall, plaster, and ceiling tile) as necessary, to access pipe fittings.
Glovebags shall only be used once and may not be moved. The bag shall be securely attached and sealed to the pipe. All of the necessary tools and equipment shall be inserted into the bag prior to being sealed. Smoke test the bag for leaks prior to use. Glovebags shall not be used on surfaces that have temperatures exceeding 66 degrees C to 150 degrees Fahrenheit. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape.

C. ABATEMENT: Thoroughly wet asbestos material with amended water or removal encapsulant inside bag and allow to saturate. Wet material adequately to penetrate and soak material through to substrate. Remove TSI from piping. Thoroughly clean pipe. Remove air from glovebag with HEPA-filtered vacuum. With removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glovebag from the pipe. Remove tape or cut bag to open the top of the glovebag and fold down into disposal bag. Collapse glovebag with HEPA vacuum, twist top of bag, seal with at least three wraps of duct tape, fold over, and seal again.

D. CLEARANCE: Clean all surfaces inside the secondary containment. No dust or debris shall be present. Request AMS to perform a visual inspection. Apply encapsulant and allow to thoroughly dry. Request AMS to perform an aggressive clearance testing of the secondary containment area shall be performed.

E. PERSONAL PROTECTION: Double suiting and a remote decontamination unit may be used for personal protection. The outside suit must be removed prior to exiting the secondary containment. Workers must wear respirator protection.

F. RELEASE: In the event of a spill or a breach of the glovebag, the entire area enclosed in the secondary containment shall immediately be put under negative air pressure. The entire area shall then be cleaned by HEPA vacuuming and wet wiping. Aggressive clearance testing shall be performed after cleaning. The Owner shall be notified immediately.

3.12 ASBESTOS CAULKING/GLAZING (EXTERIOR WINDOWS, DOORS, GRILLS) –not used

3.13 REMOVAL OF ASBESTOS FLOORING AND MASTIC

A. VINYL ASBESTOS FLOOR TILE, MASTIC, AND COVE BASE ADHESIVE: Remove vinyl asbestos floor tile (VAT), mastic, and cove base adhesive. If Work is in conjunction with other friable asbestos abatement work, perform abatement inside full containment.

If abatement is only for the floor tile, mastic, and cove base adhesive, Work may be performed in accordance with Section III.S.1. “Abatement of Special Materials” of CDPHE Regulation 8.

Work shall be performed using critical barriers and negative air flow through a HEPA filter. The zone shall be secured against entry by any unauthorized or
untrained person throughout the Work. Post warning signs and erect temporary barricades.

Remove all moveable materials (appliances, furniture, equipment, debris) from the Work Area. Remove any binding strips or other restrictive moldings from walls. Do not damage walls. VAT and mastic may be located under carpeting or other non-asbestos materials (floor tile, linoleum). Overlying non-asbestos materials may be removed as non-asbestos debris as long as the underlying asbestos materials are not attached during removal.

Remove VAT and mastic so that it does not become friable during removal. Remove floor tiles without breakage and place in disposal bags. Mist Work Area continuously with amended water whenever necessary to reduce airborne fiber counts. If the underlying substrate is not impervious, control excess water so that leakage does not occur to underlying materials and floors.

Removal of VAT/mastic may be performed with wet methods and hand scrapers. Heating and/or the application of dry ice may be used also. Power tools, grinders or other machines that may produce dust during removal of VAT/mastic are not allowed. Vinyl asbestos floor tile and mastic shall be removed down to existing floor without damaging the floor. Never sand or dry scrape mastic. Use amended water. Remove saturated material in small sections. Use stiff bladed scraper to remove excess felt. HEPA vacuum each area as it is abated.

The underlying floor shall be sufficiently smooth to accept new floor covering without further preparatory work.

Solvents may be used to remove mastic but odors shall not cause adverse affects to tenants. The EnvContractor shall utilize the solvent in accordance with all manufacturer guidelines and OSHA regulations. Engineer must review solvent materials prior to use. Floors shall be washed with soap and water after use of solvents. If solvents cause adverse impact to occupants or workers, then the type of solvent shall be changed or discontinued. EnvContractor shall wash floor after use of solvents to remove any remaining residual solvent.

Clean the entire floor using a wet/dry vacuum cleaner equipped with a HEPA filtration system. Do not sweep. After removal of VAT and mastic and cove base adhesive, proceed with decontamination and final inspection and testing of the Work Area as specified elsewhere in this section.

B. GENERAL ABATEMENT PRACTICES: Do not allow asbestos materials to dry out. Mist Work Area continuously with amended water whenever necessary to reduce airborne fiber counts.

Damaged or deteriorated areas shall be repaired or replaced as necessary to the approval of the Owner. Pre-existing conditions shall be recorded and a list submitted to the Owner prior to starting Work. Areas damaged by the removal Work shall be repaired to a “like-new” condition unless identified as future demolition work (Coordinate with Owner).
Replacement of floor materials is not required.

C. CLEARANCE: Clean all surfaces inside the secondary containment. Apply encapsulant. Aggressive clearance testing of the secondary containment area shall be performed.

D. PERSONAL PROTECTION: Double suiting and a remote decontamination unit may be used for personal protection. The outside suit must be removed prior to exiting the secondary containment. Workers must wear respirator protection.

3.14 FACILITY COMPONENT REMOVAL OF ASBESTOS

A. APPLICATION: Only those facility components on which asbestos is well adhered may be taken out of the facility as units or in sections. The Owner shall identify the components that can be removed as a unit. All component removal shall be performed under secondary containment with negative air flow. Component removal may include asbestos sinks with undercoating, pipe insulation, and transite sheets.

B. INSTALLATION AND ABATEMENT: The Work Area shall be isolated with critical barriers. The EnvContractor shall perform component removal by adequately wetting the component and then wrapping in the unit(s) with six (6) mil polyethylene. The wrapped portion may require the removal of small amounts of asbestos from either side of the component to be cut; this will be a Class I or III operation depending on the amount of asbestos removed. Once the asbestos on the ends of the component is removed and the component wrapped, the component is then cut.

C. CLEARANCE: Clean all surfaces inside the secondary containment. No dust or debris shall be present. Request AMS to perform a visual inspection. Apply lockdown and allow to thoroughly dry. Request AMS to perform an aggressive clearance testing of the secondary containment area shall be performed.

D. PERSONAL PROTECTION: Double suiting and a remote decontamination unit may be used for personal protection. The outside suit must be removed prior to exiting the secondary containment. Workers must wear respirator protection.

E. RELEASE: In the event of a spill or a breach of the component wrap, the entire area enclosed in the secondary containment shall immediately be put under negative air pressure. The entire area shall then be cleaned by HEPA vacuuming and wet wiping. Aggressive clearance testing shall be performed after cleaning. The Owner shall be notified immediately.

3.15 REMOVAL OF ASBESTOS TRANSITE – not used

3.16 DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIAL

A. DISPOSAL: Disposal includes packaging of asbestos-containing waste materials and disposal by land filling.
B. CONTAINERS: Load all asbestos-containing waste material in disposal bags or leak tight drums. All materials are to be contained in one of the following:

- Two 6-mil disposal bag, or
- One 6-mil disposal bag and a fiberboard drum, or
- Sealed steel drum with no bag.

Provide 6-mil thick leak tight polyethylene bags labeled with labels text as follows:

**CAUTION**
**CONTAINS ASBESTOS FIBERS**
**AVOID CREATING DUST**
**BREATHING ASBESTOS IS HAZARDOUS TO YOUR HEALTH**

Provide markings in accordance with U.S. Department of Transportation regulation on hazardous waste marking (49 CFR 171 through 178, Hazardous Substances):

**WASTE HAZARDOUS SUBSTANCE**
**(ASBESTOS), 9, NA 2212, III**

Each container shall be labeled with the name of the generator and location where asbestos was generated.

C. STORAGE: Do not store containerized materials outside of the Work Area. Take containers from the Work Area directly to a sealed truck or dumpster.

D. TRANSPORT: All waste is to be hauled by a waste hauler with all required licenses from all state and local authorities with jurisdiction. Do not transport disposal materials on open trucks. Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as asbestos-containing waste and dispose of in accordance with this specification.

Advise the landfill operator at least ten days in advance of transport of the quantity of material to be delivered. Retain receipts from landfill for materials disposed. At a disposal site, sealed plastic bags must be carefully unloaded from the truck. If bags are broken or damaged, immediately rebag at the disposal site. The entire truck shall be cleaned.

All hazardous wastes generated by this project shall be managed, stored, transported, and disposed of in accordance with 40 CFR 260-266.

All hazardous waste shipping manifests shall be prepared by EnvContractor and signed by Owner. At completion of hauling and disposal of each load, submit copy of waste manifest, chain-of-custody form, and landfill receipt to the Owner. All forms shall be fully completed with signatures.

END OF SECTION 02081
SECTION 2082
REGULATED MATERIALS (NON-ASBESTOS)

PART 1 – GENERAL

1.1 SUMMARY

A. The objective of the project is to remove regulated materials located at University of Colorado at Boulder, Smiley Court, Fort Collins, Colorado. Smiley court is being demolished; removal of regulated materials must be performed prior to demolition.

The work covered by this section includes the removal of regulated materials encountered during demolition associated with this project, and this section describes procedures and equipment required to protect workers and occupants in the regulated area from contact with regulated materials. The work includes complete removal and disposal of all regulated building materials including fluorescent bulbs, ballasts, transformer, mercury gauges, fire extinguishers, smoke detectors, paints, and miscellaneous cleaning supplies.

All Work identified in these specifications shall be performed by the Environmental Contractor (EnvContractor) unless the task is specifically identified to be performed by the Owner.

B. The general sequence of Work for each zone will be as follows:

1. The Owner or General Contractor will provide connections in the building for electrical power, water supply, and disposal water.

2. The Owner will remove furniture, materials, equipment, etc.

3. EnvContractor shall remove and package
   a. PCB light ballasts and fluorescent light bulbs (non-green tipped).
   b. Non-PCB light ballasts and green-tipped fluorescent light bulbs.
   c. Laboratory sink drain traps.

4. EnvContractor shall prepare the necessary paperwork and containers for transportation and disposal of PCB light ballasts, fluorescent light bulbs (non-green tipped), and laboratory sink drain traps.

5. EnvContractor shall move containers to a temporary onsite storage location as identified by the Owner.

6. The EnvContractor shall transport and dispose of PCB light ballasts, fluorescent light bulbs (non-green tipped), and drain trap wastes in compliance with applicable regulations.
7. The EnvContractor shall coordinate all work with General Contractor and Owner.

1.2 REFERENCES, CODES AND REGULATIONS

A. ENVCONTRACTOR RESPONSIBILITY: The EnvContractor shall assume full responsibility and liability for compliance with all applicable federal, state, and local regulations pertaining to work practices; packaging; transporting; disposal; and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The EnvContractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations. The EnvContractor shall hold the Owner harmless for failure to comply with any applicable Work from hauling, disposal, safety, health, or other regulation on the part of himself, his employees, or his subcontractors.

B. FEDERAL REQUIREMENTS: Federal requirements governing solid and hazardous waste work or hauling and disposal of solid and hazardous waste materials include, but are not limited to, the following:

1. OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, including, but not limited to:
   a. Personal Protection Equipment: Title 29 Part 1910 Subpart I;
   b. Access to Employee Exposure and Medical Records: Title 29, Part 1910, Section 1020 of the Code of Federal Regulations;
   c. Hazard Communication: Title 29, Part 1910, Section 1200 of the Code of Federal Regulations; and

2. NIOSH: National Institute for Occupational Safety and Health, including, but not limited to:

3. DOT: U.S. Department of Transportation, including, but not limited to:

4. EPA: U.S. Environmental Protection Agency, including, but not limited to:


c. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and SARA Title III, National Contingency Plan and Reportable Quantities, Title 40, Parts 300 and 302 of the Code of Federal Regulations.

C. STATE REQUIREMENTS: State requirements governing solid and hazardous waste work, or hauling and disposal of solid and hazardous waste materials include, but are not limited to, the following:


D. PERMITS: EnvContractor shall obtain permits as required by Federal, State, and local regulations.

1.3 ENVIRONMENTAL PROTECTION

A. The EnvContractor shall provide and maintain all insurance coverages called for and required as follows in addition to the insurance requirements identifies in the special supplementary General Conditions:

1. Environmental Liability Insurance

   The EnvContractor shall add the Owner, Engineer, and Subcontractors to all insurance policies as an additional named insured. Minimum limit of project-specific liability per occurrence of $2,000,000. All comprehensive and general asbestos liability insurance shall be written on a project-specific, true “occurrence” basis. EnvContractor’s general liability insurance policy shall not contain an environmental exclusion unless environmental coverage is provided under another insurance policy.

B. INDEMNIFICATION

1. The EnvContractor further specifically obligates himself to the Owner in the following respects, to-wit:

   a. to indemnify the Owner, Engineer, and subcontractors against and save them harmless from any and all claims, suits, liability, expense or damage for any alleged or actual infringement or violation or any patent or patent right arising in connection with this Agreement and anything done thereunder,
b to indemnify the Owner, Engineer, and subcontractors against and
save them harmless from any and all claims, suits or liability for
injuries to property, injuries to persons, including death, and from
any other claims, suits or liability on account of any act or
omission of the EnvContractor, or any of his officers, agents,
employees or servants,

c to pay for all materials furnished and work and labor performed
under this Agreement, and to satisfy the Owner thereupon
whenever demand is made, and to indemnify the Owner,
Engineer, and subcontractors against and save them and the
premises harmless from any and all claims, suits or liens therefore
by others than the EnvContractor,

d to obtain and pay for all permits, licenses and official inspections
made necessary by his work, and to comply with all laws,
ordinances and regulations bearing on his work and the conduct
thereof and

e the EnvContractor warrants and guarantees the Work and
materials covered by this Agreement and agrees to make good, at
his own expense, any defect in materials or workmanship which
may occur or develop prior to the Owner's release from
responsibility to the Owner.

2. Further, the EnvContractor shall indemnify the Owner, Engineer, and
subcontractor against, and save them harmless from any and all loss,
damage, costs, expenses and attorneys' fees suffered or incurred on
account of any breach of the aforesaid obligations and covenants, and
any other provision or covenant of this Agreement.

1.4 SUBMITTALS

A. The Owner shall receive a copy of the Plan of Action, insurance certificates,
schedule, disposal locations(s), waste manifests, shipping papers, disposal
receipts, OSHA and DOT training certification, permits, Health and Safety Plan,
Spill Prevention Plan, and exemptions. The Plan of Action, bonds, insurance
certificates, schedule, and worker training certifications must be received prior to
mobilization.

1.5 SITE CONDITIONS

A. Where the EnvContractor's operations could cause damage or inconvenience to
telephone, television, power, gas, water, sewer, or existing systems, the
operations shall be suspended until all arrangements necessary for the
protection of these utilities and services have been made by the EnvContractor.

The release of regulated materials may create a potential health hazard to
workmen and site occupants. Notify Owner immediately in case of any
release of regulated materials. Apprise all workers, supervisory
personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures that must be followed.

1.6 PROJECT COORDINATION

A. PLAN OF ACTION: EnvContractor shall submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the chemical handling procedures, spill protection plan, spill response procedures, Health and Safety plan, method of disposal, disposal location for each chemical, documentation that disposal sites are permitted, worker training certification, and schedule.

The plan must be approved by Owner prior to commencement of Work.

B. SCHEDULING: The abatement work shall be performed in a continuous manner. The scheduling and sequencing must be coordinated with the Owner and General Contractor. The EnvContractor shall submit an abatement schedule.

1.7 HEALTH AND SAFETY

A. HEALTH AND SAFETY PLAN: EnvContractor shall develop and implement a Health and Safety Plan (HASP). The HASP shall be submitted to the Owner. The EnvContractor shall provide written documentation that all workers have been instructed regarding the HASP. No smoking, chewing, eating, or drinking shall be allowed within the work areas.

B. SPILL PREVENTION PLAN: EnvContractor shall develop and implement a Spill Prevention Plan. The Spill Prevention Plan shall be submitted to the Owner. EnvContractor shall have adequate equipment onsite to respond to a spill that might occur while dismantling, packaging, and loading the chemicals.

C. WORKER TRAINING: All workers shall meet the training requirements for OSHA's Hazardous Waste Operations, Title 29, Part 1910, Section 120 regarding 40-hour training and medical monitoring for hazardous waste operations. Submit copies of training certificates for each worker performing the required tasks.

Workers that: (1) load, unload, or handle hazardous materials, (2) prepare hazardous materials for transportation, (3) are responsible for the safety of transporting hazardous materials, or (4) operate a vehicle used to transport hazardous materials must comply with DOT training as identified in 49 CFR Part 172.704. Submit copies of training certificates for applicable workers.

D. PERSONAL PROTECTIVE EQUIPMENT: Workers shall be provided personal protective equipment (PPE) as required in the Health and Safety Plan. PPE will be specific to the work tasks. EnvContractor shall assure that workers wear the identified PPE. At a minimum, workers shall wear protective coveralls, chemical resistant gloves, safety boots, and safety glasses. An emergency eye wash station shall be provided.
PART 2 – PRODUCTS: Not Used

PART 3 – EXECUTION

3.1 PCB LIGHT BALLASTS

A. The EnvContractor shall inspect all fluorescent light ballasts for labeling. All ballasts not labeled “Non-PCB” or “PCB free” or similar designation shall be removed and placed in drums for disposal as PCB wastes. All ballasts labeled “Non-PCB” or “PCB free” or similar designation shall be removed and salvaged for reuse by the Owner as non-PCB material. All containers shall be in good condition with no leaks, rust, or dents. All containers shall be labeled. All wastes shall be removed from the site within 90 days of generation.

EnvContractor shall be responsible for removing, packaging, transporting and disposing of PCB wastes. EnvContractor shall be responsible for removing, packaging, and transporting to an Owner’s designated storage site all non-PCB wastes. The Owner’s storage site is located within three miles of the campus.

All regulated wastes generated by this project shall be managed, stored, transported, and disposed of in accordance with 40 CFR 260-266.

3.2 FLUORESCENT LIGHT BULBS

A. The EnvContractor shall inspect all fluorescent light bulbs for “green tips.” All fluorescent light bulbs that do not contain green tips shall be removed and stored unbroken in acceptable containers for disposal as mercury wastes. All fluorescent light bulbs that do contain green tips shall be removed and salvaged for reuse as non-mercury material. All containers shall be in good condition with no leaks, rust, or dents. All containers shall be labeled. All wastes shall be removed from the site within 90 days of generation.

EnvContractor shall be responsible for removing, packaging, transporting and disposing of non-green tipped light bulbs. EnvContractor shall be responsible for removing, packaging, and transporting to an Owner’s designated storage site all green tipped light bulbs for reuse by the owner. The Owner’s storage site is located within one mile of the campus.

All regulated wastes generated by this project shall be managed, stored, transported, and disposed of in accordance with 40 CFR 260-266. Fluorescent bulbs are covered under the Universal Waste Rule and shall be labeled in accordance with universal waste requirements.

3.3 LABORATORY SINK DRAIN TRAPS

A. The EnvContractor shall remove and dispose of the laboratory drain traps and associated wastes/wastewater located in the traps. The laboratory drain traps are under sinks located in laboratory chemicals hoods and laboratory
benches/work stations. The laboratory drain traps shall be removed without spilling liquids or solids caught in the trap. The remaining end of the drain going to the sewer shall be plugged to prevent sewer gases from entering the building.

Laboratory drain traps and wastes shall be collected and stored in 55-gallon poly drums. All containers shall be in good condition with no leaks, rust, or dents. All containers shall be labeled.

The Environmental Consultant shall sample and analyze the waste for disposal characterization. EnvContractor shall allow ten working days for laboratory analysis.

EnvContractor shall transport and properly dispose of the wastes. EnvContractor shall assume that the wastes can be disposed of as a non-hazardous liquid waste. All wastes shall be removed from the site within 90 days of generation.

All regulated wastes generated by this project shall be managed, stored, transported, and disposed of in accordance with 40 CFR 260-266.

3.4 PACKAGING AND TRANSPORTATION

A. CHARACTERIZATION:

Hazardous materials are defined in 49 CFR, Subchapter C, Part 171.

Hazardous wastes are defined in 40 CFR Part 261.

Solid wastes are defined in 40 CFR Part 261.

B. PACKAGING: Regulated materials prepared for shipment must be packaged in accordance with DOT regulations including packaging, labeling, marking, shipping papers, and waste manifests. Temporary storage will be allowed onsite pending arrangement for transportation. Temporary storage shall be located inside a building.

Containers must be compatible with the chemicals stored inside. EnvContractor shall not mix non-hazardous and hazardous materials. EnvContractor shall not mix non-compatible materials.

Empty containers previously holding regulated materials must meet the regulatory definition of "empty" (40 CFR 261.7). Only when the "empty" conditions are met shall containers be disposed of as solid waste. For containers with less than 110 gallons capacity, no more than one inch of residue shall remain in the container. All liquids shall be freely drained from containers.

C. TRANSPORTATION: Regulated materials must be transported in accordance with DOT regulations including transporting, placarding, shipping papers, and waste manifests. EnvContractor shall prepare all shipping papers and waste manifests.
Transportation of hazardous waste must also comply with EPA RCRA’s regulations regarding transporter identification number and hazardous waste manifests.

D. DISPOSAL: All regulated materials and containers must be disposed of in accordance with EPA’s RCRA regulations 40 CFR Parts 261 - 270. Materials will be characterized as either solid waste or hazardous waste for disposal purposes. Disposal must only occur at EPA and State permitted facilities for each specific waste.

EnvContractor shall submit disposal recommendations for each chemical to the Owner for review prior to packaging and transportation. The disposal site for hazardous waste shall be reviewed and approved by the Owner. EnvContractor shall submit name, address, phone number, and permit verification for the final destination of all chemical materials.

Retain receipts from disposal sites for all materials disposed. At completion of hauling, submit copy of waste manifest, shipping papers, chain-of-custody form, and disposal facility receipt to the Owner. All forms shall be legible and fully completed with signatures.

All hazardous waste shipping manifests shall be prepared by EnvContractor and signed by Owner. At completion of hauling and disposal of each load, submit copy of waste manifest, chain-of-custody form, and disposal receipt to the Owner. All forms shall be fully completed with signatures. All manifests for waste generated on site shall list the Owner’s EPA generator identification number. The EPA generator number will be provided by the Owner during manifest signature coordination.

EnvContractor shall be responsible for all costs associated for removal, transportation, and disposal.

END OF SECTION 02082
**UNIVERSITY OF COLORADO AT BOULDER**  
**POLICY FOR FLUORESCENT LIGHT BALLASTS AND BULBS**

** Fluorescent Light Ballasts  
Ballasts removed from fluorescent lights by Contractors during University of Colorado at Boulder projects must be evaluated to determine if they must be managed as PCB-containing materials. Ballasts manufactured after 1979 that do not contain PCB’s are labeled “No PCB’s”; if the ballast isn’t labeled, it should be assumed to contain PCB’s. Personnel involved with removing the ballasts during the Project must determine whether each individual ballast is labeled with the words “No PCB’s”; and ballasts with this label can be trash disposed (municipal landfill) or recycled (preferred).

Ballasts without the label “No PCB’s” must be collected, managed and disposed of through a permitted waste disposal facility as PCB-containing materials, in full compliance with all applicable Federal, State and local regulations.

All leaking ballasts, regardless of whether or not they are labeled as “No PCB’s” must be collected in a separate container from non-leaking ballasts for incineration at a permitted waste disposal facility.

** Fluorescent bulbs  
Fluorescent bulbs with a “green tip” (the metal on the end caps is green, meaning it is low-mercury), or similarly marked as being “low mercury” on the side of the bulb towards an end cap can be trash disposed (municipal landfill) or recycled (preferred).

All other fluorescent bulbs must be collected, managed and disposed of through a permitted waste disposal facility as a Universal Waste, in full compliance with all applicable Federal, State and local regulations. Bulbs are to be shipped intact, packaged properly to protect them from breakage (usually in cardboard boxes) directly to a permitted waste disposal facility. Broken bulbs need to be cleaned up and disposed with the intact bulbs.

All disposal or recycling costs, disposal arrangements and providing materials for proper management and disposal of fluorescent bulbs and ballasts are the responsibility of the Contractor.

Copies of all documentation regarding material/waste disposal, e.g. hazardous waste manifest, bill of lading, out of service dates, etc., must be provided to Environmental Health & Safety (EH&S); please coordinate your waste disposal arrangements with the Hazardous Materials Program Manager (303-492-8531, Mark.Lapham@Colorado.edu) or other Hazardous Materials Personnel (303-492-7845, hazmat@Colorado.edu) to ensure that the appropriate contact information, EPA site ID numbers, signatures, etc. are utilized on disposal paperwork.

All fluorescent bulbs and ballasts collected must be stored in a manner that prevents accidental releases to the environment, e.g. drums, tubs, boxes, etc. Leaking ballasts must be handled and managed using controls that will eliminate spills and/or releases, and clean-up materials must be properly disposed. It is recommended that good hygiene practices, including wearing chemical-resistant gloves and safety glasses, be followed during the handling of fluorescent bulbs and ballasts to prevent possible exposures or injuries as appropriate.

All other hazardous materials/wastes generated by the Project must similarly be managed and disposed of properly by the Contractor. Questions pertaining to material/waste management and disposal can be referred to the EH&S Hazardous Materials Program Manager at 303-492-8531, Mark.Lapham@Colorado.edu, or Hazardous Materials personnel at 303-492-7845, hazmat@Colorado.edu.
# TABLE 1
SMILEY COURT CHILDREN’S CENTER
ESTIMATED ASBESTOS QUANTITIES

<table>
<thead>
<tr>
<th>BUILDING A</th>
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<tbody>
<tr>
<td>DRYWALL TEXTURE (CEILINGS/WALLS)</td>
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<tr>
<td>DRYWALL JOINT COMPOUND</td>
<td>INCLUDED ABOVE</td>
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<td>SHEET VINYL FLOORING</td>
<td>70 SQUARE FEET</td>
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<td>EXPOSED FLOOR TILE</td>
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<td>SINK UNDERCOATING</td>
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<table>
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<td>DRYWALL TEXTURE (CEILINGS/WALLS)</td>
<td>5,200 SQUARE FEET</td>
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<tr>
<td>DRYWALL JOINT COMPOUND</td>
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<tr>
<td>SHEET VINYL FLOORING</td>
<td>70 SQUARE FEET</td>
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<tr>
<td>EXPOSED FLOOR TILE</td>
<td>400 SQUARE FEET</td>
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<td>SINK UNDERCOATING</td>
<td>4 EACH</td>
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<th>BUILDING C</th>
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<td>DRYWALL TEXTURE (CEILINGS/WALLS)</td>
<td>5,200 SQUARE FEET</td>
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<td>INCLUDED ABOVE</td>
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<tr>
<td>EXPOSED FLOOR TILE</td>
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<td>SINK UNDERCOATING</td>
<td>4 EACH</td>
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<td>DRYWALL JOINT COMPOUND</td>
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<tr>
<td>PIPE WRAP</td>
<td>3 LINEAL FEET</td>
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## TABLE 2
SMILEY COURT CHILDREN’S CENTER
ALTERNATE #2
ESTIMATED ASBESTOS QUANTITIES – TOTAL FLOOR TILE

<table>
<thead>
<tr>
<th>Building</th>
<th>Area</th>
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<tr>
<td>BUILDING A</td>
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<td></td>
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<tr>
<td>BUILDING B</td>
<td>FLOOR TILE</td>
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<tr>
<td></td>
<td>1100 SQUARE FEET</td>
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<tr>
<td>BUILDING C</td>
<td>FLOOR TILE</td>
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<tr>
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<td>1000 SQUARE FEET</td>
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<tr>
<td>BUILDING D</td>
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<td></td>
<td>1100 SQUARE FEET</td>
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### TABLE 3. REGULATED BUILDING MATERIALS

#### BUILDING COMPONENTS INVENTORY

**Client:** University of Colorado at Boulder  
**CTL|T Project No.:** FC05108.024  
**Date:** September 15 and 16, 2010  
**Inspector:** Nick Talocco

**BUILDING:** Smiley Court Children's Center

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<th>LOCATION</th>
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TO EXCAVATION OR CONSTRUCTION.
MARK ALL UNDERGROUND LINES AT LEAST TWO DAYS PRIOR TO
CENTRAL OF COLORADO LYNX1, 747 S. COLORADO, ON LOCATION. TO
ACCORDING TO COLORADO LAW, THE UTILITY NOTIFICATION

Contact: Thomas Homann, PE

ENVIRONMENTAL

ENGINEER:

Boulder, Colorado
DEPARTMENT OF HOUSING AND DINING
FOR

Boulder, Colorado
UNIVERSITY OF COLORADO

DESTRUCTION PROJECT - 2010

DESTRUCTION DOCUMENTS FOR THE