



SECTION 024100

BUILDING AND ANCILLARY STRUCTURES DEMOLITION

PART 1 GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.
- B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of the CONTRACT AND GENERAL CONDITIONS.
- C. The Contractor is directed to the Harvard University Construction Environmental Health and Safety Standard, the Demolition Exhibit, and other applicable Exhibits based on the scope of the project.

1.02 DESCRIPTION OF WORK

- A. The Contractor shall provide labor, materials and equipment to complete the [total] [selective] demolition of the building(s) as shown on the Drawings. Generally, the demolition work shall include, but not be limited to:
 - 1. File all necessary notices, obtain all permits and licenses, and pay all governmental taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.
 - 2. The Contractor is responsible to compile a written engineering survey developed by a qualified person for any structural demolition activities. The engineering survey shall address as a minimum the items outlined in the Demolition Exhibit from the Harvard University Construction EH&S Standard.
 - 3. The Contractor, in the presence of the Engineer, shall record a video tape of existing conditions adjacent to the site, including sidewalks, curbing, utility structures, light poles, and other features.
 - 3. Demolition and removal of all designated buildings and structures within the Limit of Work.
 - 4. Demolition and removal of all foundation walls and floor slabs.
 - [5. Removal of designated pavement. Disturbance of bituminous concrete pavement shall be limited to that necessary to cut and cap utilities within the minimum distance from the building to be demolished and that necessary to remove the conduits and tunnels. Damage to pavement, landscape areas, and other structures/areas outside of this minimum distance shall be repaired by the Contractor at no additional cost to Harvard.]



- [6. Segregation and on-site crushing of **uncoated** asphalt, brick and concrete (ABC) materials from buildings to be reused/recycled as processed fill in accordance with Section 312000-EARTHWORKS.]
- [7. Segregation and shipment of **uncoated** asphalt, brick and concrete (ABC) materials from buildings for off-site crushing and reuse/recycling.]
- [8. Segregation and off-site disposal of **coated** asphalt, brick and concrete (ABC) from buildings.]
9. Removal and recycling/disposal of demolished materials are at the Contractor's expense. Except for those items specifically designated to be turned over to Harvard, all existing removed materials, items, trash, and debris shall become the property of the Contractor and shall be completely removed from the site and legally disposed, recycled, and salvaged at the Contractor's expense. On-site sale of material is not permitted.
10. Protection of site structures and features that are designated to remain.
11. Scheduling and sequencing operations without interrupting utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and Harvard. Provide temporary services as necessary to serve occupied and usable facilities when permanent utilities must be interrupted, or schedule interruption when the least amount of inconvenience will result.
12. [Salvaged items shall be marked to allow for reconstruction at another location.]
13. [Salvaged items shall be crated and moved to an on-site location determined by Harvard.]

1.03 RELATED WORK

- A. Section 013543 – ENVIRONMENTAL PROTECTION
- B. Section 015716 – SHORT-TERM PEST CONTROL
- C. Section 017419 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
- D. Section 026000 - MISCELLANEOUS HAZARDOUS MATERIAL REMOVAL
- E. Section 026100 – EXCAVATED SOIL AND MATERIAL MANAGEMENT PLAN
- F. Section 026500 – REMOVAL AND DISPOSAL OF STORAGE TANKS
- G. Section 028200 - ASBESTOS ABATEMENT AND RELATED WORK
- H. Section 028300 - LEAD-BASED PAINT ABATEMENT AND RELATED WORK
- I. Section 312000 - EARTHWORK

1.04 REFERENCES



The publications listed below form a part of this specification to the extent referenced. The publications are referenced in text by basic designation only. The list provided below is not intended to be all inclusive of each regulation prevailing over the work. The latest version of the document listed shall govern the work performed.

- A. Massachusetts Department of Environmental Protection, 310 CMR 19.000, Solid Waste Management Regulations.
- B. Massachusetts Department of Environmental Protection, 310 CMR 16.00, Site Assignment Regulations for Solid Waste Facilities, latest version. (310 CMR 16.05: Asphalt Pavement, Brick, and Concrete Recycling).
- C. Massachusetts Department of Environmental Protection 310 CMR 7.00, Air Pollution Control Regulations, latest version. (310 CMR 7.07-7.10: Open Burning, Incinerators, Dust, Odor, Construction & Demolition, Noise and 310 CMR 7.15: Asbestos).
- D. Massachusetts Department of Labor and Workforce Development, 453 CMR 6.00, The Removal, Containment or Encapsulation of Asbestos.
- E. Massachusetts Division of Occupational Safety, 454 CMR 22.00, Deleading.
- F. Massachusetts Department of Public Safety, 780 CMR, Building Code.
- G. Code of Federal Regulations, 40 CFR Part 763, Asbestos.
- H. Occupational Safety and Health Administration, 29 CFR 1926.62, Lead in Construction.
- I. Occupational Safety and Health Administration, 29 CFR 1926 Subpart T, Demolition.
- J. American National Standard Institute, A10.6-2006, Safety Requirements for Demolition for Construction and Demolition Operations.
- K. National Fire Protection Association, 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- L. Harvard University Construction Environmental Health and Safety Standard, the Demolition Exhibit, and other applicable Exhibits based on the scope of the project.

1.05 DEFINITIONS

- A. Harvard Project Manager: A representative of the Property Owner, President and Fellows of Harvard College.
- B. Engineer: Authorized representative of the Harvard Project Manager. Engineer shall be the Architect or Designer of Record for the project.
- C. Contractor: Refers to the General Contractor and/or Subcontractor responsible for the Work under contract with Project Manager.
- D. ABC: Asphalt, Brick and Concrete
- E. ANSI: American National Standards Institute



- F. Coated ABC: Coated brick, concrete and concrete masonry units. Coatings shall include, but not be limited to: paint, stucco applications, plaster, etc.
- G. Demolition: Total or selective destruction of building or portions of buildings; removal of building materials for renovation projects
- H. Disposal: Removal off-site of demolition and construction debris and subsequent sale, recycling, reuse, or deposit in a permitted solid waste landfill or incinerator acceptable to authorities having jurisdiction.
- I. DOT: Department of Transportation
- J. DPS: Department of Public Safety
- K. Mass DEP: Massachusetts Department of Environmental Protection
- L. NFPA: National Fire Protection Association
- M. OSHA: Occupational Safety and Health Administration
- N. Remove: Remove and reuse, recycle, treat and dispose of items except those indicated to be reinstalled, salvaged, or to remain Harvard's property.
- O. Remove and Salvage: Items indicated to be removed and salvaged remain Harvard's property. Carefully remove, clean, and pack or crate items to protect against damage. Prepare and attach all packed or crated items to wood pallets for outside storage. Identify contents of containers and deliver to Harvard's designated storage area.
- P. Structural Demolition – demolition of any portion of a space that supports or adds support to the structure.
- Q. USEPA: United States Environmental Protection Agency

1.06 SCHEDULE

- A. The Contractor and the Engineer shall develop a demolition schedule for each phase of the work at the Pre-Construction Conference. The Engineer may chose to alter the work sequence to meet the specific needs of the project.
- B. The Contractor and the Engineer shall develop a hazardous materials removal schedule for each phase of the work at the Pre-Construction Conference. The Engineer may choose to alter the work sequence as required.
- C. The Contractor shall not perform total or selective demolition of a building until asbestos abatement, bird guano removal, and hazardous materials removal has occurred.
- D. The Engineer will confirm that required abatement and removal activities have been completed and that clearance samples have been collected and shown to be within the standards for each building.
- E. The Contractor shall update the schedule and submit any schedule changes for review by



the Engineer at the weekly construction meetings.

1.07 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain Harvard's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition that all recyclable demolition material shall be recycled and non-recyclable material shall be disposed at a Harvard approved facility.
- B. Historical items shown in the selective demolition, building cornerstones and their contents indicated remain Harvard's property. Carefully remove and salvage each item in a manner to prevent damage by packaging in custom wood crates and deliver promptly to Harvard.

1.08 SUBMITTALS

- A. The Contractor shall submit each item in this Article according to the Conditions of the Contract and Section 013300 - SUBMITTALS, for information only, unless otherwise indicated.
- B. Regulatory Submissions:
 - [1. "Notification for On-Site Rubble Crushing." The Contractor shall provide notice of rubble crushing to Mass DEP and the City of [Cambridge/Boston] Board of Health in accordance with 310 CMR 16.05(3)(e)6. The Notification Form is available at (<http://www.mass.gov/dep/recycle/laws/abc.htm>) and shall be submitted at least 30 days prior to crushing the rubble.]
 - [2. "Beneficial Use Determination (BUD)." The Contractor shall prepare a BUD application and obtain approval of the project from Mass DEP in accordance with 310 CMR 19.060. The Contractor shall abide by the BUD requirements including the submission of the Notification Form above.]
 - 4. "Notification Prior to Construction or Demolition." The Contractor shall provide notice of construction and demolition activities to Mass DEP in accordance with 310 CMR 7.09. The Notification Form (BWP AQ 06) is available at the Massachusetts Department of Environmental Protection Website. Notification shall be submitted at least 10 working days prior to the construction or demolition of the building.
- C. Shop Drawings:
 - 1. Scaffolding details
 - 2. Temporary shoring
- D. Quality Control Submittals (prior to commencement of on-site demolition):
 - 1. Methods of demolition and equipment proposed to demolish structures.



2. Waste Management Plan to indicate the types of wastes to be removed from the project and the proposed reuse, recycling, treatment and disposal locations. Include names and addresses of back-up reuse, recycling, treatment and disposal facilities.
 3. Copies of any authorizations and permits required to perform the work, including disposal/recycling facility permits.
- E. Contract Closeout Submittals (throughout project and prior to authorization of final payment):
1. Records of the amounts of waste generated, by waste type and facilities where these materials were shipped for reuse, recycling, treatment and disposal.
 2. Evidence (shipping manifests and weight receipts) of lawful reuse, recycling, treatment or disposal of all wastes generated.
 3. Final As-Built Plan.
- F. Schedule of Demolition Activities:
1. Detailed sequence of demolition and removal work, with early and late starting and finishing dates for each activity. Ensure on-site operations are uninterrupted if applicable.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Locations of proposed dust- and noise-control temporary partitions and means of egress.
 5. Means of protection for items to remain and items in path of waste removal from building.
- G. Inventory: After [total] [selective] demolition is complete, submit a list of items that have been removed and salvaged and where the material will be delivered.
- H. Pre-Demolition Photographs or Videotapes: Show existing conditions in sufficient detail of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.
- I. [Incinerator/Landfill Records: Provide material shipping records [hazardous waste manifests (i.e., for off-site hazardous waste management)] indicating receipt and acceptance of solid/hazardous wastes by the incinerator/landfill facility in accordance with Section 017419 - CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.]

1.09 REGULATORY REQUIREMENTS

- A. The Contractor is solely responsible for obtaining permits or approvals which may be required to perform the work of this section, including all costs, fees and taxes required or



levied. Notify and obtain such permits or approvals from all agencies having jurisdiction over demolition prior to starting work including, but not limited to Fire Departments of the City of [Cambridge/Boston] and local, state and federal agencies.

- B. The Contractor is required to provide notification to Mass DEP ten (10) working days prior to construction or demolition of building. Notification is made by using Mass DEP form BWP AQ 06 "Notification Prior to Construction or Demolition."
- C. Obtain demolition permits from the DPS for the project. DPS requires that the Contractor provide a letter from each impacted utility verifying termination of service prior to issuance of the demolition permit.
- D. Comply with all applicable federal, state, and local safety and health requirements regarding the demolition of structures and other site features as applicable.
- E. Conform to procedures identified in Section 026000 MISCELLANEOUS HAZARDOUS MATERIAL REMOVAL when discovering hazardous or contaminated materials.

1.10 QUALITY ASSURANCE

- A. **Examination of Existing Conditions:** The Contractor shall examine the Drawings for demolition and removal requirements and provisions for new Work. Verify all existing conditions and dimensions before commencing Work. The Contractor shall visit the site and examine the existing conditions and shall inform herself/himself of the character, extent and type of demolition and removal Work to be performed. The Contractor shall submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.
- B. **Demolition Firm Qualifications:** An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- C. **Regulatory Requirements:** Comply with governing USEPA and Mass DEP notification regulations before beginning demolition. Comply with local, state and federal hauling and re-use/recycling/treatment/disposal regulations.
- D. **Standards:** Comply with ANSI A10.6 and NFPA 241.
- E. **Pre-demolition Conference:** Conduct conference at the Site. Review methods and procedures related to selective demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates



exposed by demolition operations.

1.11 PROJECT CONDITIONS

- A. Harvard assumes no responsibility for actual condition of buildings to be [selectively] [totally] demolished.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Harvard as far as practical.
- [C. Asbestos and hazardous materials are present in the building to be [selectively][totally] demolished. Copies of information regarding the presence of asbestos and hazardous materials are attached as appendices to this Section. The Contractor shall examine the report to become aware of locations where asbestos and hazardous materials are present.]
- [D. Asbestos abatement (Section 028200), PCB abatement (section 020720) and hazardous material removal (Section 026000) as specified herein and as shown on the drawings.]
- [E. Do not disturb asbestos, PCBs or hazardous material, or any material suspected of containing asbestos, PCBs or hazardous material except under the procedures specified elsewhere in the Contract Documents.]
- F. Storage or sale of removed items or materials will not be permitted.

[1.12 LEAD-BASED PAINT

- A. Lead-containing paint may be present on several components located throughout the building areas scheduled for demolition. Lead abatement of these components shall be required for performance of the demolition work outlined therein. Refer to Section 028300 – LEAD-BASED PAINT ABATEMENT AND RELATED WORK.
- B. Removal of lead paint will be performed at the Contractor's expense in accordance with applicable OSHA requirements. No additional compensation shall be granted for any engineering control methods employed by the Contractor for compliance with this Section, OSHA or other applicable requirements.
- C. Harvard has performed a limited lead survey of certain locations within the building however 100% testing of all painted surfaces throughout the building to confirm the presence of lead paint was not performed. Due to the age of the buildings and previous painting history, assume any paint not tested to be lead containing and comply with this section and OSHA regulations accordingly. Refer to the Appendix attached to this specification that summarizes any testing performed by the Engineer.]

PART 2 - PRODUCTS



2.01 MATERIALS

All materials required to complete the work under this Section shall conform to the standards and requirements of local codes, ordinances, municipalities, regulatory agencies, utility companies and other agencies having jurisdiction over the work to be performed.

PART 3 EXECUTION

3.01 GENERAL

A. Verify site conditions before proceeding with demolition work. Field check the accuracy of the Drawings and inspect structures and utilities prior to start of work and notify the Engineer in writing, of any hazardous conditions and/or discrepancies. Primary structures and other site features are shown on Drawings; other smaller structures, including, but not limited to, concrete walks and pads, miscellaneous signs, lamp posts, railings, and fencing may not be shown on the Drawings, but may exist and shall be demolished as part of the work of this Section.

1. Unknown Site Conditions - The information provided on the Drawings and in the Specifications is believed accurate, but the Contractor should field verify all information. The Contractor shall bear full responsibility for obtaining all locations of underground structures, utilities and their connections. Services to buildings outside the Limits of Work shall be maintained and all resulting costs or charges shall be the responsibility of the Contractor.

2. Interior Elements - Interior features including but not necessarily limited to structural elements, walls, partitions, equipment, piping or other building facilities are not shown on the drawings and must be visually inspected prior to submittal of bid, and again prior to initiation of on-site work. The Contractor shall be responsible for performing its own inspection and appraisal of all features and facilities to be demolished or removed for salvage. The Contractor shall also investigate to assure itself of the condition of the work to be demolished and shall take all precautions necessary to ensure safety of people and property.

B. The demolition of the buildings, underground utilities and related appurtenances shall be accomplished by methods which will not cause damage to surrounding structures, underground and overhead utilities, or other existing items and structures that are to remain in place. All debris shall be promptly and properly managed as the demolition progresses. Construct and/or prepare material Staging/Stockpile areas as required at locations approved by the Engineer.

3.02 UTILITY SERVICES

A. Terminate utilities serving the individual buildings prior to commencing [total] [selective] demolition of each building.

3.04 WORK RESTRICTIONS

A. Burning is not permitted.



- B. The use of explosives is not permitted.

3.05 PREPARATION

- A. **Site Access and Temporary Controls:** Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities. Damage or impact to any public or private property including sidewalks, roadways, landscape areas, or buildings/structures will be immediately repaired at no cost to Harvard.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Harvard. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations. Conduct selective demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the Engineer.
 3. Protect existing site improvements and appurtenances to remain.
- B. **Temporary Shoring:** Provide and maintain shoring, bracing, and structural supports as required to preserve stability prevent unexpected or uncontrolled movement or collapse of construction being demolished and as required to prevent damage to adjacent buildings, structures, or property not part of this work.
1. Strengthen or add new supports when required during progress of demolition as described by the engineering survey.
 2. Remove temporary shoring, bracing and structural supports when no longer required.
 3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.
 4. Conform with OSHA safe excavation and excavation support regulations for any and all shoring work.
- C. **Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.**
1. Erect temporary protection, such as walks, fences, and overhead protection (if applicable) where required by authorities having jurisdiction or as shown on the plans. Provide temporary barricades as required to limit access to demolition areas.
- D. **Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.**
- E. **Pre-clean buildings of miscellaneous solid waste in preparation for asbestos abatement and hazardous materials removal. Remove ash from boilers, breeching and stack prior to beginning asbestos abatement.**



F. Demolition activities in each building shall not be initiated until a hazardous material assessment has been completed and the requirements of [Section 028200 - ASBESTOS ABATEMENT AND RELATED WORK], [Section 020720 – PCB REMEDIATION OF BUILDING MATERIALS], [Section 028300 – LEAD-BASED PAINT REMOVAL AND RELATED WORK], and [Section 026000 MISCELLANEOUS HAZARDOUS MATERIALS REMOVAL] have been satisfied. Demolition activities shall be initiated at the direction of the Harvard Project Manager.

G. Utilities:

1. The Contractor must notify Dig Safe to request a utility mark-out for the Site prior to performing any demolition work.
2. The Contractor must notify Harvard Engineering & Utilities (E&U) requesting a utility mark-out for the Site prior to performing any demolition work.
3. Terminate utilities serving the individual buildings prior to commencing demolition of each building.

[H. Wildlife Control

1. The Contractor shall implement the requirements of Section 015716 – SHORT-TERM PEST CONTROL prior to starting demolition activities.
2. Remove from structures all rodents and other animals prior to demolition.
3. Removal methods shall prevent infestation of adjoining properties.]

3.06 HAZARDOUS MATERIALS

A. Hazardous Materials

1. Prior to demolition, remove asbestos, PCBs, oil and other hazardous materials in accordance with Sections 028200 – ASBESTOS ABATEMENT AND RELATED WORK, 020720 – PCB REMEDIATION OF BUILDING MATERIAL and 026000 – MISCELLANEOUS HAZARDOUS MATERIAL REMOVAL, respectively.

B. Biological

1. The Contractor is notified that there may be localized occurrences of mold, mildew and bird guano on the structures to be demolished. Inhalation of these materials could present a hazard to workers.
2. The Contractor shall perform abatement, debris removal, and demolition activities in a manner that prevents workers exposure to airborne pathogens and biological matter.
3. The Contractor is responsible for the lawful collection, characterization and disposal of all biological matter on surfaces in accordance with USEPA and Mass DEP Regulations.

C. Lead-Based Paint



1. Harvard has performed a limited lead survey of the building however, 100% testing was not performed of all painted surfaces throughout the building. Due to the age of the buildings and previous painting history, assume any paint not tested to be lead containing and comply with this section and OSHA regulations accordingly. Refer to the Appendix attached to this specification that summarizes any testing performed by the Engineer.
 - a. A number of state, federal and local agencies regulate work that involves lead paint. The Contractor is hereby notified that there are paint coatings on the structures to be demolished that contain lead. This lead could present a hazard to workers and requires regulatory compliance with 29 CFR 1926.62 “Lead in Construction.”
 - b. Of specific concern is the cutting of steel components using torch methods. If the Contractor intends to torch cut painted steel, lead paint must be removed from the area to be cut with a chemical stripper or other means prior to cutting. Sufficient paint must be removed from the area to prevent volatilization of lead during the heating of the steel. Other methods of controlling worker exposure to lead will be acceptable provided that they are addressed in the Contractor’s “Lead Exposure Plan” and that they meet the requirements of 29 CFR 1926.62.
 - c. The Contractor is responsible for the lawful collection, characterization and disposal of all paint chip debris and flaking paint on surfaces in accordance with USEPA and Mass DEP Regulations.
 - d. Where activities may generate leaded dust or impact a leaded surface, regulate work area so that dust migration is contained properly within the regulated area. Once the work is complete, properly clean up and dispose of leaded dust and materials.
2. Removal of lead paint will be performed at the Contractor’s expense in accordance with applicable OSHA requirements and Section 028300 – LEAD-BASED PAINT REMOVAL AND RELATED WORK. No additional compensation shall be granted for any engineering control methods employed by the Contractor for compliance with this Section, OSHA or other applicable requirements.]

D. Oil and Hazardous Material Contamination

1. There is known [no known] soil contamination in the vicinity of [Building]. However, contaminated soil may be encountered during foundation excavation or at other areas of the site. In the event that contaminated soil is encountered, such material will be handled in accordance with Section 026100 – EXCAVATED SOIL AND MATERIAL MANAGEMENT PLAN.
2. The Contractor working in areas of the building where contamination is likely to be encountered shall be appropriately trained, as required in Section 013529 – HAZARDOUS MATERIALS HEALTH AND SAFETY PLAN.
3. When working in areas of the site where contamination is likely to be encountered, the Contractor’s Site Safety Officer shall monitor the work area in accordance with the Contractor’s Health and Safety Plan.

3.07 DEMOLITION



- A. General: Demolish and remove existing construction, including below grade features such as, but not limited to, partial removal of foundation walls, slabs, piping, conduit, and wiring. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 2. Maintain adequate ventilation when using cutting torches.
 3. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 4. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 5. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 6. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 – CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT.
- B. Structure Demolition
1. Demolish and completely remove existing buildings and structures within the Limit of Work. Structure demolition shall include the demolition of all structural and non-structural building elements, mechanical systems, equipment, other items within the building, and appurtenances and ancillary components within, and fixed to, the building. All equipment and other items within the building shall be demolished as required and removed for reuse, recycling, or lawful disposal. A tabular schedule of building areas and materials is attached as an Appendix to this specification.
 2. All building foundation components and related elements including floor slabs shall be completely removed.
 3. Ensure no unstable building elements are left unsupported. Place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this Contract. During demolition, the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, or other structural element shall be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.
- C. [Selective Demolition
1. Selectively demolish and remove existing building components as shown on the



- demolition drawings. Use methods required to complete Work within limitations of governing regulations.
2. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition work above each floor or tier before disturbing supporting members on lower levels.
 3. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 4. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 5. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices and a fire watch detail during all flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Re-use/recycle/disposal of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
 11. Provide a system to mark and identify each salvaged piece so that the salvaged material can be reconstructed (in the future) at another location.
 12. Selectively demolish the surrounding concrete and masonry not to be salvaged, in small sections. Cut concrete and masonry at junctures between demolished and salvaged items, using power-driven masonry saw or hand tools; do not use power-driven impact tools.]



- C. Surrounding Facilities: Note that the Limit of Work is shown on the Drawings. The limit of demolition activities includes only building footprint, those areas that are impacted by tunnel removal and cutting and capping of utilities.
- D. [IF ON-SITE RE-USE OF ABC IS ALLOWED: All asphalt, brick and concrete (ABC) rubble shall be separated from wood, mechanical equipment and steel. Any oil-stained or coated ABC rubble shall be separated and properly disposed off-site. The ABC rubble is to be maintained onsite for crushing. Wood shall be recycled off-site by the Contractor. Steel, rebar, cast iron and other metals shall be removed from the Project Site and recycled. Prior to demolition by heavy equipment, remove internal metal, wood and mechanical equipment. Reuse, salvage and recycle materials from the demolition to the greatest extent possible.

When the ABC rubble is to be crushed onsite and used as backfill:

1. Crush clean brick and concrete to less than 6" dimension for use as backfill on site. Specific sieve gradation requirements for recycled fill are included in Section 312000 - EARTHWORK.
 2. Crushed ABC rubble shall not be used as backfill within the 200-foot Wetlands Protection Act boundary. Common Fill shall be used to backfill and achieve final grades within the 200-foot Wetlands Protection Act boundary. The Contractor is responsible to comply with the Wetlands Protection Act and associated approvals, permits and orders, as applicable.
 3. Locations where crushed ABC rubble is used as backfill must be recorded on the Drawings in the field at the time of placement and be transferred to the final as-built plan to be submitted after all filling is complete.]
- E. [IF ON-SITE RE-USE OF ABC IS NOT ALLOWED: On-site crushing of ABC rubble as described in 310 CMR 16.05(3) (e), is not allowed. All ABC rubble shall be separated from wood, mechanical equipment and steel. Any oil-stained or coated ABC shall be further separated and properly disposed. All ABC material must be transported off-site to an ABC crushing or recycling operation that is either conditionally exempt from 310 CMR 16.00 or has been sited and permitted in accordance with 310 CMR 16.00 and 310 CMR 19.000, respectively.]
- F. Steam Tunnels and Conduits
1. Intact steam tunnels and conduits shown on the Drawings within the Limits of Work shall be [removed in their entirety].
 - a. All asbestos shall be abated in accordance with Section 028200 ASBESTOS ABATEMENT AND RELATED WORK. All piping and conduit shall be removed and disposed or recycled.
 - b. The designated manhole shall be removed and backfilled.
- G. Miscellaneous Site Demolition
1. Remove and properly dispose of all miscellaneous debris, miscellaneous solid waste, abandoned supplies, brush, stumps, equipment, or other materials located within the Limit of Work, including the interior of the buildings to be demolished.



2. Demolish and remove paved areas as shown on the Drawings including roadways, pathways, bituminous concrete paving materials, and cement concrete paving materials. Saw cut pavement to be removed at interface with pavement to remain. Provide a flush, full depth saw cut edge where pavement, curb and concrete removals abut existing surfaces to remain undisturbed. Repair edges of cut sections that remain so that no trip/fall hazards are present.

3.08 DISPOSAL

- A. Disposal of Demolition Materials Removed from Site - Reuse, recycle, treat and dispose all materials from demolition (i.e. metals, wood, oil stained concrete, miscellaneous waste, etc.) as well as all equipment and other materials that are within the buildings. The off-site management of these materials shall be approved by Harvard EH&S. The loading of demolition materials shall be performed in a manner that prevents materials and activities from generating excessive dust and ensure minimum interference with roads, sidewalks and streets both onsite and offsite.
- B. Facility Documentation - Provide evidence, on an on-going basis, that demolition materials have been received at the designated recycle, reuse, salvage or disposal facility. Documentation shall include but not be limited to weight receipts, manifests, bills of lading, etc. Transport of all materials off-site shall be in accordance with applicable DOT Regulations. Harvard shall not pay for the off-site management of demolition materials until complete documentation is received by Harvard EH&S. All materials leaving the site shall become the property of Contractor.

3.09 BACKFILLING

- A. Backfill Material and Compaction:
 1. Conform to Section 312000 - EARTHWORK

3.10 DUST CONTROL

- A. The Contractor shall implement fugitive dust suppression to prevent unacceptable levels of dust resulting from demolition operations or other activities required by the Contract. It shall be the Contractor's responsibility to supervise fugitive dust control measures and to visually monitor airborne particulate matter. Comply with applicable provisions of Section 013543 – ENVIRONMENTAL PROTECTION.

3.11 CLEANUP

- A. Remove all debris, residuals, and materials at the conclusion of demolition activities.