SECTION 026100

EXCAVATED SOIL AND MATERIAL MANAGEMENT PLAN

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - 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.

1.02 DESCRIPTION OF WORK

A. This Section provides procedures and requirements for management of excavated soils, sediments, and other materials either encountered or generated during construction activities. This Section also includes materials classification, stockpiling, off-site transportation, [off-site reuse, recycling, treatment and disposal], measures to control dust, odors, and gases, and contingencies. The following Work shall be undertaken by the Contractor:

1. Excavate, handle, re-handle, load, and transport soils and materials from the site to legal off-site reuse, recycling, treatment and disposal facilities in accordance with the criteria contained herein, and the provisions of the Massachusetts Contingency Plan, 310 CMR 40.0000, the Massachusetts Hazardous Waste Management Regulations, 310 CMR 30.000, the Massachusetts Solid Waste Management Regulations, 310 CMR 19.000, and all other applicable local, state and federal laws and regulations, guidelines and policies.

2. On-site processing and reuse of excavated soils on-site in accordance with the criteria contained herein, and the provisions of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 and all other applicable state and federal laws and regulations.

3. Excavate, handle, re-handle, load, and transport soils and materials generated from the [City of Cambridge/City of Boston] public ways to off-site reuse, recycling, treatment and disposal facilities in accordance with the criteria contained herein, and the provisions of the Massachusetts Contingency Plan, 310 CMR 40.0000, the Massachusetts Hazardous Waste Management Regulations, 310 CMR 30.000, the Massachusetts

Solid Waste Management Regulations, 310 CMR 19.000, and all other applicable local, state and federal laws and regulations, guidelines and policies. These materials shall be segregated from soils and materials generated from the site and tracked and manifested under separate documentation.

4. [On-site treatment and chemical testing of soils containing leachable concentrations of metals (as required).]

5. Determine the Harvard approved destination facility using the chemical test data provided within this specification and contract for the off-site reuse, recycling, treatment and disposal directly with each facility approved by the Project Manager. At the time of shipment, the Owner's Licensed Site Professional (LSP) shall complete all paperwork (e.g. Form BWSC-012) necessary to transport excavated soils and materials from the site to approved off-site facilities as specified herein, and provide documentation (e.g. Form BWSC-012C) of the facility receipt within 7 days of final shipment. The process to achieve approval at a disposal facility and prepare the required paperwork and/or conduct any additional chemical testing requested by the Contractor-proposed facility shall be included in the scheduling and estimating of the project.

6. [At the direction of the Project Manager, temporarily stockpile soils that have not been pre-characterized, appear inconsistent with pre-characterization data based on visual or olfactory evidence of contamination, require additional chemical testing, or are approved for reuse on-site in accordance with the requirements contained herein.]

7. Excavate materials by methods which will permit observation of exposed subsurface soils to identify, test and segregate any soils/waste, and which will eliminate the potential for mixing contaminated soils with uncontaminated soils. Excavation shall be limited in depth and area to limit cross-contamination.

8. No soil shall be shipped off-site without a Bill of Lading, Material Shipping Record, Uniform Hazardous Waste Manifest, and/or Harvard University Asbestos Waste Shipment Record. The Project Manager will provide the services of an LSP to manage the off-site removal process including preparation of the Waste Profile, Bill of Lading, Material Shipping Record, Uniform Hazardous Waste Manifest and/or Harvard University Asbestos Waste Shipment Record.

9. The Contractor shall not remove regulated or hazardous contaminated soil or soil materials from the site without approval of the LSP and the Project Manager.

10. Over excavate to "native soil" as directed by the Project Manager or the LSP.

B. This section provides additional procedures and requirements for management of soils with Asbestos Containing Material (ACM). Material classification, on-site management, site protection measures, off-site transportation, and disposal are also included. The following Work shall be undertaken by the Contractor if the Project Manager's LSP has identified ACM in the materials to be excavated:

1. Prepare detailed ACM Work Plan in accordance with applicable regulations. The work plan will be reviewed by the Project Manager, the LSP and Certified Industrial Hygienist, and submitted to MassDEP for approval. File appropriate paperwork with MassDEP (ANF-001, AQ-06) as well as any local notifications within the designated timeframe prior to the start of work.

2. Utilize Harvard approved licensed asbestos abatement subcontractor with trained asbestos abatement workers in accordance with the Massachusetts Department of Labor and Workforce Development regulation for the removal, containment, and encapsulation of ACM as set forth in 453 CMR 6.00.

3. Utilize the Harvard Asbestos Waste Tracking Record (AWSR) and other applicable shipping records (Bill of Lading, Material Shipping Record) and ensure receipt of return manifest to Harvard within the required timeframe.

4. Perform excavation of soil with ACM in accordance with approved MassDEP ACM Work Plan.

5. Implement site protection measures.

6. Comply with Federal, State and Local notification permits and licenses governing soil with ACM.

1.03 RELATED WORK

A. Section 011400 – CONSTRUCTION MITIGATION

B. Section 013529 – HAZARDOUS MATERIALS HEALTH AND SAFETY

C. Section 013543 – ENVIRONMENTAL PROTECTION

D. Section 015000 – TEMPORARY FACILITIES AND CONTROLS

E. Section 028200 – ASBESTOS ABATEMENT AND RELATED WORK

F. Section 311000 – SITE PREPARATION

G. Section 312319 – DEWATERING

H. Section 312000 – EARTHWORK

I. Section 312500 – EROSION AND SEDIMENTATION CONTROL

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 40.0000, The Massachusetts Contingency Plan (MCP).

B. Massachusetts Department of Environmental Protection, 310 CMR 19.000, Solid Waste Management Facility Regulations.

C. Massachusetts Department of Environmental Protection, 310 CMR 30.000, Hazardous Waste Management Regulations.

D. Massachusetts Department of Environmental Protection, 310 CMR 7.000, Air Pollution Control Regulations.

E. Hazwoper: OSHA Regulation 29 CFR 1910.120.

F. Regulations of the Board of Registration of Hazardous Waste Site Cleanup Professionals, 309 CMR 1.00-9.00.

G. Board of Fire Prevention, 520 CMR 9.00 Tanks and Containers.

H. Massachusetts Department of Environmental Protection - Policies and Guidance:

1. Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, Policy # COMM-97-001, August 15, 1997.

2. Technical Update to WSC/ORS #95 141 “Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil,” May 2002.

3. Guidance for Solid Waste Handling and Disposal Facilities on Compliance with MassDEPs Waste Bans, December 23, 2005.

4. Construction of Buildings in Contaminated Areas, Policy #00-425, January 2000.

5. Guide: Using or Processing Asphalt Pavement, Brick & Concrete Rubble: http://www.mass.gov/eea/agencies/massdep/recycle/reduce/using-or-processing-asphalt-pavement-brick-and-concrete-.html

6. Interim Remediation Waste Management Policy for Petroleum Contaminated Soils, Policy WSC #94-400.

7. Similar Soils Provision Guidance, WSC #13-500, October 2, 2013

I. U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) including Title 29, Parts 1910 and 1926, as applicable.

J. U.S. Environmental Protection Agency (EPA) including but not limited to Title 40, Part 61 (National Emission Standards for Hazardous Air Pollutants) and Part 763 (Asbestos Hazard Emergency Response Act), as applicable.

K. U. S. Department of Transportation, Title 49, Parts 171, 172, and 173.

L. National Fire Protection Association (NFPA) Requirements.

M. Massachusetts Department of Occupational Safety for the Removal, Containment and Encapsulation of Asbestos Title 453 Section 6.00 of the code of Massachusetts Regulations

N. [City of Boston/City of Cambridge]: Board of Health, Fire Department and Inspectional Services

O. Harvard University, Construction Environmental Health and Safety Standard.

1.05 DEFINITIONS

A. ACM: Asbestos Containing Material

B. DOT: Department of Transportation

C. Harvard Project Manager: A representative of the Property Owner, President and Fellows of Harvard College

D. Engineer: Authorized representative of the Harvard Project Manager

E. EHS: Harvard Environmental Health and Safety Department

F. LSP: Licensed Site Professional

G. MassDEP: Massachusetts Department of Environmental Protection

H. MCP: Massachusetts Contingency Plan

I. OSHA: Occupational Safety and Health Administration

J. PID: Photoionization Detector

K. PAH: Polycyclic Aromatic Hydrocarbons

L. PCB: Polychlorinated Biphenyls

M. TPH: Total Petroleum Hydrocarbons

N. TSDF: Treatment, Storage, Disposal Facility

O. USEPA: United States Environmental Protection Agency

P. VOC: Volatile Organic Compound

1.06 QUALITY ASSURANCE/ QUALITY CONTROL PROGRAM

A. The Engineer will monitor the Contractor's activities associated with the Work of this Section. This monitoring will include, but not be limited to:

1. Observing and screening excavated soils as necessary to confirm that their quality is consistent with the findings of the pre-characterization program;

2. Establishing requirements for stockpiling, segregating, and handling if the quality of the excavated soils is not consistent with the pre-characterization program;

3. Reviewing requests from Contractor-proposed off-site disposal, reuse, recycling, and treatment facilities for additional chemical testing; and

4. Verifying that the appropriate LSP-prepared paperwork accompanies each load of excavated soils and materials that are transported from the site.

B. The Contractor shall assist the Engineer in collection of soil samples for screening and observation purposes at no additional cost to Harvard.

C. The Contractor shall be responsible for establishing and maintaining vertical and horizontal control of re-characterization layout in the field. Limits shall be field staked by the Contractor's survey crews at locations and at frequencies directed by LSP to enable verification of lines and grades. The Contractor shall immediately comply with LSP request to re-establish control as work progresses.

1.08 ENVIRONMENTAL SITE CONDITIONS

A. The site generally consists of Urban Fill overlying [INSERT description here from pre-characterization report]. A soil pre-characterization program was conducted by the LSP to obtain chemical test data for the soils slated for off-site reuse or disposal. Refer to the project reports for information regarding results of the soil pre-characterization program.

1.09 SUBMITTALS

A. Soil Facilities on the "Harvard's Utilized Facilities List"

For each of the selected off-site disposal, recycling, reuse, or treatment facilities, which are identified on the "Harvard's Utilized Facilities" list at the EHS website. The Contractor shall provide the following documentation:

1. A letter from the receiving facility confirming that the facility will accept the excavated soils and materials for disposal, reuse, recycling or treatment;

2. Certification from the receiving facility's corporate representative that the facility is operating in compliance with all applicable federal, state and municipal laws, regulations, policies and guidance for the placement, disposal, reuse, recycling and/or treatment of soil; and

3. A Statement from the receiving facility identifying any violation or complaint filed against the facility, within the past 5 years, by a municipal, state or federal agency including a description of the violation(s), date(s) of the violation, how the violation was addressed/corrected and the current status. The statement shall also include whether a financial penalty was assessed and the amount for each violation.

4. Current Certificate of Insurance naming the President and Fellow of Harvard College as the Certificate Holder.

B. Facilities <u>not</u> on the "Harvard's Utilized Facilities List"

Should a Contractor propose an off-site reuse, disposal, recycling or treatment facility or location (herein referred to as the "facility"), which is <u>not listed</u> on the "Harvard's Utilized Facilities" list at the EHS website, the Contractor shall provide the following information to EHS for consideration. Providing this information does not guarantee that the facility will be considered for use by

Harvard. Additionally a comprehensive review of the facility may take longer than the timelines listed below.

1. A minimum of 14 days prior to starting the submittals outlined in Section 1.09 provide:

    a. The property owner's name, address, telephone number, and contact person for each proposed facility. Identify property owner's corporate structure and officers and whether the property owner is a publicly-traded or privately-held company.

    b. The facility operator's name, address, telephone number, and contact person for each proposed facility. Identify the facility operator's corporate structure and officers and whether the facility operator is a publicly-traded or privately-held company.

2. A minimum of 90 days prior to transport of any soils from the site, the Contractor shall provide to the Harvard Project Manager the information outlined below. The submittal will not be considered complete until all information is received. Based on the information provided, the Harvard Project Manager may request additional information to evaluate the facility. {The Harvard Project Manager will review and approve one facility for each soil group. Additional reviews will be conducted at the Contractor's expense.}

    a. A statement from the facility's owner and operator, and the facility's LSP, indicating that the facility has reviewed the applicable chemical analysis data and soil disposal quantity information provided by the Contractor and can legally accept the material in accordance with all applicable municipal, state and federal laws, policies and guidance. This statement shall also include any contingencies upon which the acceptance is based (i.e. daily volumes, % moisture, etc.).
    b. A statement from the facility's operator and the facility's LSP, indicating whether additional soil quality testing is required to meet the facility's acceptance criteria. If additional testing is required, the facility shall indicate analytes to be tested, number of tests required and locations of tests.
    c. A description of the proposed use of soil (i.e., reuse, treatment, recycling, disposal or other) at the facility.
    d. A description of any limitations on soils proposed for transport to the facility based on material consistency (i.e., granular soil, organic soil, or cohesive soil).
    e. A description and background soil quality data representing existing conditions of the soils at the proposed facility.

f. A statement indicating whether the facility or portion of the property, or adjacent property is located in a Potential Drinking Water Source Area as defined in the Massachusetts Contingency Plan (MCP).

g. A statement identifying whether the facility, or any portion of the property, is a listed EPA Superfund site.

h. A statement identifying whether the facility, or any portion of the property, has had a documented release of oil and/or hazardous materials as defined by the MCP. If a release has occurred on the property, or any portion of the property, the statement shall identify the Release Tracking Numbers (RTNs) or other applicable state recorded tracking number, nature of the release, date of release, the project status, and whether an Activity and Use Limitation or other deed restriction applies to the property, or any portion of the property.

i. A copy of the facility's permit(s), consent order(s) and other applicable documentation under which the facility is operating which indicates the facility's testing requirements and acceptance criteria.

j. A copy of the facility's soils management plan.

k. A statement from the facility's owner and operator, and the facility's LSP, indicating that the facility is operating in accordance with all applicable municipal and state laws, regulations, policies, and guidance for the placement, disposal, reuse, recycling and/or treatment of soil. Included with this statement shall be the following documentation:

    i. Copies of all applicable municipal, state or federal documents, to include but not be limited to: permits, authorization to operate, plan approvals, order of conditions, site assignments, inspection reports, and consent order(s) for facility operations.

    ii. Copies of all enforcement actions taken by municipal, state or federal regulatory officials for all operations conducted on the property including, but not limited to: administrative and unilateral consent order(s), notices, complaints, cease and desist orders, and any other applicable documentation.

    iii. A brief statement shall be provided for each violation or complaint filed against the facility by municipal, state or federal agencies, describing the violation(s), date(s) of the violation, how the violation was addressed/corrected and the current status. The statement shall also include whether a financial penalty was assessed and the amount for each violation.

l. A description of any corrective action(s) formerly or currently being undertaken at the facility to include but not be limited to treatment of the groundwater, soil, soil gas, surface water, sediment and/or air, and the installation of capping systems.

m. Life of expected facility operations.

n. Post-use of the facility and the property, including plans and approvals as appropriate.

o. Copies of the property owner's and facility operator's insurance policies which shall include but not be limited to General Liability ($1million each occurrence/$2 million aggregate); Workers Compensation ($1 million); Automobile ($1 million); Pollution Liability ($2 million each occurrence/$10 million aggregate); and Excess Liability ($10 million each occurrence & aggregate). Minimum limits are identified in parentheses. The President and Fellows of Harvard College shall be identified as the Certificate Holder on the Certificate of Insurance. **[Harvard Insurance office to determine Policy Requirements and amounts.]**

p. For permitted solid waste management facilities, the facility shall provide a copy of the closure and post-closure cost estimate, the breakdown of the costs used to develop these estimates, and the regulatory approval of the closure and post-closure cost estimate. The closure and post-closure cost estimate shall be prepared and stamped by a registered professional Engineer. The facility shall also provide a copy of the Financial Assurance Mechanism (FAM) to support the closure and post-closure cost estimates.

q. Copies of the most recent Environmental Monitoring Reports, drawings identifying the location of the monitoring networks (i.e. gas, groundwater and surface water), groundwater contour plans, and analytical data.

r. Names, addresses, contact information of the top ten companies/firms which have brought or are currently bringing material to the facility.

s. A statement indicating whether the owner and operator of the facility has any pending litigation or has had a case litigated in the past 5 years; the nature of the litigation shall be identified, if applicable.

t. Facility information necessary to complete Section E of MassDEP Bureau of Waste Site Cleanup Form BWSC-012A Bill of Lading (Group II and III soils), and to complete Section E of MassDEP Bureau of Waste Prevention Material Shipping Record and Log (Group I soils).

3. If the above information is complete and deemed a possible location for Harvard soils, Harvard will conduct an on-site audit of the facility to determine whether the facility meets Harvard's criteria for acceptance of soil.

4. The Harvard Project Manager and Engineer will review information submitted by the Contractor as detailed above. The Harvard Project Manager may reject a facility if the submittal process is incomplete, the results of the on-site audit indicates the proposed facility is not operating in accordance with the facility's permit(s) and best management practices, facility does not meet facility audit criteria, and/or the information provided and audit findings indicate that the facility may put Harvard at risk. If the facility is found acceptable, the Engineer will prepare a letter of acceptance for signature by the facility and the facility's LSP. This letter, once signed and returned to the Engineer, will constitute approval of the facility for this project. The Engineer will prepare this letter within 7 days of satisfactory completion of the above submittal requirements.

C. The Harvard Project Manager reserves the right to reject any facility identified on "Harvard's Utilized Facilities List" or any facility requested by the Contractor for failure to comply with federal, state or municipal laws, rules or regulations.

D. A minimum of 14 days prior to transport of any soils from the site, the Contractor shall provide a letter stating the name and address of the transporter for each material group classification and each off-site facility as applicable. The Engineer will prepare a Bill of Lading or Material Shipping Record for each facility within 7 days of approval of the facility as outlined in Section 1.09 and following receipt of the transporter information.

E. Within 7 days of shipment, the Contractor shall submit copies of completed Material Shipping Record & Log Forms and Bills of Lading (BWSC-012B) documenting transport of excavated soils and materials from the site to approved off-site disposal, reuse, recycling, and treatment facilities. The submittal shall also include weight slips, both tare and gross, for each load transported from the site to the disposal facility. Progress payments will only be made upon receipt of said documents. Within 7 days of the last shipment, the Contractor shall submit the completed BWSC-012C.

F. A minimum of 14 days prior to the start of on-site activities, submit to the Engineer, for review and approval, a narrative describing the schedule, sequence, and procedures for excavation and off-site management of the soil, and the on-site stockpiling and on-site reuse of excavated soils. The narrative shall include a description and accompanying scale drawing indicating the space to be used for various activities (e.g. storage for soil, space for removal of the debris and conditioning of soil in preparation for reuse, etc.). Narrative shall include schedule and anticipated volume of soil generation for various activities, and schedule and anticipated locations for reuse of stockpiled soils.

G. Within 30 days prior to soil excavation and for treatment in place prior to excavation, the Construction Manager shall submit to the Project Manager the following listed documents. No soil excavation work shall commence until these

items are reviewed and approved by the Project Manager. Submittal data shall be in sufficient detail to enable the Project Manager to identify the particular product or equipment, and to form an opinion as to its conformity to the Specifications. Each submittal item shall be identified with a cover page or transmittal sheet containing the listed submittal number presented in the same numerical order as outlined below.

1. Plan of Action & Standard Operating Procedures: Submit a detailed plan of the procedures and engineering controls proposed for use in complying with the requirements of this Specification. Include in the plan drawings or sketches detailing critical isolation barriers and enclosures and the location and layout of decontamination areas. (Submittal #2)

2. Name of analytical laboratory for OSHA monitoring. (Submittal #3)

3. Completed copies of all applicable notifications, permits, and licenses. (Submittal #4)

4. Proposed Treatment Plan for Group III-2 soils, if applicable. The Contractor shall submit a proposed work plan outlining the procedure for treatment, testing and monitoring of Group III-2 materials. The work plan shall include type of treatment, chemical constituents of chemicals to be applied, method of application, method of mixing, site logistics, confirmatory testing program, schedule, and other support documentation for the proposed procedure.

5. Soil Management Plan (Submittal #5) that includes:

    a. Submit a detailed plan for the preparation, handling and use of Waste Shipment Records and or manifests.
    b. Submit name, location, and applicable licenses for primary and secondary landfills, and soil reclamation, recycling and treatment facilities for each category of soil identified applicable to this Project. Submit copies of required licenses and/or operating permits for all facilities. Submit letters from each of these identified facilities that the owner's/operator's agree to accept the volume of soils identified and will submit to the Project Manager, by fax, overnight express mail, or by courier delivery within 5 Days, all facility signed Waste Shipment Records or manifests. The Contractor shall also provide the names and applicable federal and state permits for all transporters proposed to be used on this project.

    c. Health and Safety Plan as required.

6. Training and Medical Surveillance Records (Submittal #7): For General Superintendent, supervisors, and foremen, the Construction Manager

shall submit to the Engineer the following items prior to starting any asbestos abatement work at the site. .

For individual workers, submit the following items prior to the individual worker being allowed to work on the project:

a. Submit a copy of the training certificate and Massachusetts Department of Labor and Workforce Development Certification for each worker.
b. Report from Medical Examination: Submit a copy of Physician's Written Opinion as defined by 29 CFR 1926.1101(m)(4) for medical examination conducted within last 12 months as part of compliance with OSHA medial surveillance requirements for each worker who is to enter the Work Area.

H. Submit the following items to the Project Manager for approval within 30 days of Project completion:
1. Analytical results of soil treatment
2. Executed Waste Management Shipment Records.

PART 2 - PRODUCTS

2.01 STOCKPILE/CONTAINMENT OF SOIL MATERIALS

A. Polyethylene: 6-mil and 20-mil thickness.

B. The polyethylene shall be manufactured of new, first quality product designed and manufactured specifically for the intended use and have the following properties;

1. The material shall be 3 ply polyethylene reinforced with a nonwoven grid of high strength nylon cord.

2. The material shall be U.V. resistant (black in color) and cold cracked resistant to 40 degrees F.

3. The material shall be manufactured in a minimum 12 foot seamless width. Labels on the rolls shall identify the thickness, length, width, and manufacturer's mark number.

C. Jersey barriers shall be provided for definition of work area and containment of stockpiles (if necessary).

D. Hay bales and silt fence shall be placed around the work area and containment of stockpiles (if necessary) to minimize soil runoff from the stockpile-area.

E. Soil with ACM is strictly prohibited from being stockpiled on site. All soil with ACM must be securely packaged for transport if staged on site.

PART 3 - EXECUTION

3.01 GENERAL

A. Conduct all work under this and other applicable Sections in accordance with all local, state, and federal regulations and Contractor health and safety protocols.

3.02 EXCAVATION

A. Excavate by methods that will permit observation of soils for the purpose of identifying, screening, testing, and segregating soils as necessary prior to off-site removal.

B. Excavate beyond the limits of proposed improvements when directed by the Engineer to remove localized areas of stained soil which indicate visual, olfactory, or field screening evidence of contamination.

C. Conduct excavation to prevent cross-contamination of soil group classifications.

D. Segregate oversized and/or other deleterious materials from excavated soils prior to off-site removal as necessary to meet disposal facility acceptance criteria or as directed by the Project Manager. Segregation may consist of hand labor or mechanical screeners.

E. Excavation shall be conducted in accordance with the requirements set forth in Section 312000 – Earthwork.

3.03 ON-SITE REUSE OF EXCAVATED SOILS

A. The Contractor shall coordinate, sequence, and schedule work as required in order to reuse Group I-1, I-2, I-2A, and/or I-3 soils on-site, to the extent practicable and allowable under the MCP, by the LSP of Record and the geotechnical engineer.

B. Soils designated for on-site reuse shall meet the requirements for backfill specified in Section 312000 - Earthwork and shall be processed, if necessary, to remove oversize cobbles or boulders.

3.04 TEMPORARY STOCKPILING OF EXCAVATED MATERIAL

A. Excavated soils shall be loaded directly onto trucks for removal to approved off-site receiving facilities with the following exceptions: visibly stained or odor impacted soils; soils exhibiting characteristics inconsistent with pre-characterization data; soils requiring additional testing; and soils excavated for construction of utilities in public streets. Soils shall not be stockpiled on-site or at temporary off-site locations unless otherwise approved by the Project Manager.

B. Soils that require additional chemical testing or treatment, or are approved for reuse on-site, shall be temporarily stored in stockpiles segregated by group classification and located in on-site areas proposed by the Contractor and approved by the Harvard Project Manager.

C. Stockpiling of soils at off-site locations must be approved by the Engineer prior to excavation.

D. The Contractor shall place Jersey barriers around stockpiles to provide confinement. Haybales and other siltation control measures are required to prevent erosion and washing of stockpiled soils from their temporary storage locations.

E. Soils shall be stockpiled on either 6-mil polyethylene sheeting or an impermeable surface such as asphalt. Alternatively, excavated soil may be stockpiled on soil of the same material group classification.

F. Stockpiles shall be securely covered with 6-mil (10-mil for asbestos-containing soils) polyethylene sheeting at the end of each workday to prevent erosion or fugitive dust. Sheeting shall be securely weighed down.

G. Stockpiles shall be securely covered with 6-mil polyethylene sheeting as necessary during the course of each workday as necessary to prevent erosion or fugitive dust.

H. As required by the MCP regulations, excavated Group II soils shall not be stockpiled for longer than 120 days.

I. Stockpiles shall be segregated by soil group classification.

J. Asbestos containing soils have additional requirements, as described in 3.09.

3.05 CLASSIFICATION OF SOILS

Excavated materials such as soil and below-grade solid wastes shall be classified into four general groups for purposes of off-site reuse, recycling, treatment and disposal according to criteria established by Harvard University and applicable federal, state, and

local agencies having jurisdiction over the Work. On-site re-use of soils is strongly encouraged, where appropriate and feasible.

Classification of soils is most often based on the results of the pre-characterization sampling program. Soils may be reclassified by the Owner's Licensed Site Professional (LSP) during excavation based on the field screening measures, visual and olfactory observations, and the results of additional laboratory chemical testing conducted following the pre-characterization program.

The classification of soils provided herein is for soils excavated from "Disposal Sites" as defined by the Massachusetts Contingency Plan (MCP). Soils excavated from locations which are not classified as "Disposal Sites" may be reused on-site, re-used off-site, or managed as addressed below, but are not subject to the MCP.

Regardless of initial soil classification, the physical and chemical characteristics of the soils must ultimately meet the receiving facility's soil acceptance criteria. Where applicable, the local, state and federal licensing requirements dictate the type and quality of soil which are acceptable at the receiving facilities. Off-site management of soils includes reuse, recycling, treatment and/or disposal. Under no circumstances shall any soil or material group be transported to unlined solid waste landfills or to soil reclamation projects where current or future development includes residential dwellings, schools, playgrounds, recreational areas or similar use sites.

The off-site management of remediation waste may be subject to one or more of the following regulations and associated policies: the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000); the Massachusetts Solid Waste Management Regulations (310 CMR 19.000); the Site Assignment for Solid Waste Facilities (310 CMR 16.00); the Massachusetts Hazardous Waste Regulations (310 CMR 30.000); the federal Toxic Substances Control Act (40 CFM 761); the Massachusetts Air Pollution Control Regulations (310 CMR 7.000); and associated policies, the "Interim Policy Regarding the Regulatory Status of Soils Contaminated with Waste Oil of Unknown Origin and /or Hazardous Constituents", Policy HW-01 ('referred to as the Smoking Gun Policy'(01/20/1993)), "Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil," Technical Update to WSC/ORS #95- 141, dated May 2002; "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, Policy # COMM 97-001" dated August 1997, and Similar Soils Provision Guidance, WSC #13-500, October 2, 2013.

A. GROUP I

Naturally deposited or fill soils that may contain oil, waste oil, or one or more hazardous materials at concentrations less than an otherwise applicable Reportable Concentration (RCS-1), and that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000. Group I soils must not contain visible

evidence of asbestos-containing materials (ACM). Group I soils may be transported off-site under the provisions of the MCP without notice or approval from MassDEP. The transport of Group I soils from the site to appropriate off-site facilities shall be tracked using either Massachusetts Department of Environmental Protection (MassDEP) Material Shipping Record (MSR) & Log Forms or Bureau of Waste Site Cleanup Bills of Lading (BOL), both of which shall be prepared by the Owner's LSP.

1. Group I-1: Naturally-deposited soils that contain no visual evidence of ACM, no detectable concentrations of Total Petroleum Hydrocarbons (TPH), Volatile Organic Compounds (VOCs), Polychlorinated Biphenyl (PCBs) and/or other contaminants, and where the metals and/or Polycyclic Aromatic Hydrocarbons (PAHs) concentrations are not greater than the concentrations in Table 1: MADEP Identified Background Levels in Soil of MassDEP's Technical Update to WSC/ORS #95- 141 "Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil," dated May 2002. These soils may be managed off-site at locations: (1) determined acceptable by Harvard University; and (2) where the existing concentrations of oil or hazardous material at the receiving location soils are similar to or greater than the site soils or that are in accordance with the Similar Soils Provision Guidance.

   Facilities which may accept Group I-1 soils include the following: quarries or land reclamation properties, recycling or treatment facilities, or lined solid waste (Subtitle D) landfills. These soils shall be transported and managed to only off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner. These soils may also be reused on-site for construction purposes upon approval by the Owner.

2. Group I-2: Naturally-deposited soils that contain oil or hazardous materials at concentrations less than applicable Reportable Concentrations RCS-1 specified in 310 CMR 40.1600 and that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000 and MassDEP Policy HW-01. These soils may be disposed or reused at locations: (1) determined acceptable by Harvard University; (2) where the concentrations of oil or hazardous material in the receiving locations soils are similar to or greater than the site soils; and (3) where site specific MassDEP and/or municipal (e.g., Board of Health, Conservation Commission and/or Building Department) approval has been obtained by the receiving facility to accept material with contaminant levels less than MCP RCS-1.

   Facilities which may accept Group I-2 soils include the following: quarries or land reclamation properties, recycling or treatment facilities, or lined solid waste (Subtitle D) landfills. These soils shall only be

transported and managed to only off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner. These soils may also be reused on-site for construction purposes upon approval by the Owner.

3. Group I-2A: Naturally-deposited soils that contain metals arsenic, beryllium or nickel in Boston Blue Clay or arsenic in an area documented by the U.S. Geological Survey or other scientific literature and is solely attributable to natural geologic or ecologic conditions, is consistently present in the environment and in the vicinity of the sample locations, has not mobilized or transferred to another environment and where the metal concentrations are greater than the Reportable Concentrations RCS-1 specified in 310 CMR 40.1600, and that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000 and MassDEP Policy HW-01. These soils may be disposed or reused at locations: (1) determined acceptable by Harvard University; (2) where the concentrations of oil or hazardous material in the receiving locations soils are similar to or greater than the site soils; and (3) where site specific MassDEP and/or municipal (e.g., Board of Health, Conservation Commission and/or Building Department) approval has been obtained by the receiving facility to accept material with contaminant levels less than MCP RCS-1.

   Facilities which may accept Group I-2A soils include the following: quarries or land reclamation properties, recycling or treatment facilities, or lined solid waste (Subtitle D) landfills. These soils shall only be transported and managed to only off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner. These soils may also be reused on-site or off-site for construction purposes upon approval by the Owner.

4. Group I-3: Urban Fill soils that contain oil or hazardous materials at concentrations less than applicable Reportable Concentrations RCS-1 specified in 310 CMR 40.1600 and that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000 and MassDEP Policy HW-01. These soils may be disposed or reused at similar urban locations: (1) determined acceptable by Harvard University; (2) where the concentrations of oil or hazardous material in the receiving locations soils are similar to or higher than the site soils; and (3) where site specific MassDEP and/or municipal (e.g., Board of Health, Conservation Commission and/or Building Department) approval has been obtained by the receiving facility to accept material with contaminant levels less than RCS-1 contaminant levels.

   Facilities which may accept Group I-3 soils include the following: quarries or land reclamation properties, recycling or treatment facilities,

or lined solid waste (Subtitle D) landfills. These soils shall only be transported and managed only to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

5. Group I-4: Soils excavated from slurry wall, load bearing element (LBE) and caisson excavations, that are classified as Group I-1, I-2, or I-3 and are mixed with slurry from the excavation operations.

   Facilities which may accept Group I-4 soils include the following: quarries or lined solid waste landfills. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

B. GROUP II

Soils that contain oil or hazardous materials at concentrations greater than or equal to applicable RCS-1 release notification thresholds specified in 310 CMR 40.0300, and that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000 and MassDEP Policy HW-01. Group II soils are considered Remediation Waste. The transportation and off-site management of Remediation Waste is conducted in accordance with the MCP. The transportation of Group II soils from the site to appropriate off-site facilities shall be tracked using Bureau of Waste Site Cleanup Bills of Lading (BOL) prepared by Owner's LSP. The off-site management of Group II soils shall be conducted only to facilities and locations licensed, permitted, or approved to accept such materials by appropriate federal, state or local authorities and approved by the Owner.

1. Group II-2: Soils that meet the applicable criteria set forth in Table 1: Contaminant Levels for Soil Reuse at Landfills of MassDEP Policy "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills, Policy # COMM 97-001" dated August 1997, and facility-specific permit requirements for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state lined solid waste (Subtitle D) landfill.

   Facilities which may also accept Group II-2 soils include: recycling or treatment facilities, or lined solid waste (Subtitle D) landfills. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

2. Group II-3: Soils that contain concentrations of contaminants that meet all applicable criteria for recycling as set forth in the "Interim Remediation Waste Management Policy for Petroleum Contaminated Soils," MassDEP Policy WSC# 94-400 and the facility-specific licensing

requirements. Group II-3 soils must not be classified as a RCRA hazardous waste in accordance with 310 CMR 30.000.

Facilities which may accept Group II-3 soils include: in-state and out-of-state recycling facilities. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

3. Group II-4: Soils that contain concentrations of contaminants that require off-site management of soils to a regional thermal treatment facility, and are not classified as a hazardous waste as specified in 310 CMR 30.000.

   Facilities which may accept Group II-4 soils include: out-of-state thermal treatment facilities. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

4. Group II-5: Soils that contain contaminant concentrations that require the off-site shipment of the soils to a regional solid waste (Subtitle D) landfill.

   Facilities which may also accept Group II-5 soils include: recycling and treatment facilities. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

5. Group II-6: Urban Fill soil that contains ACMs and that may contain oil, or hazardous materials at concentrations either less than or greater than applicable MCP RCS-1 Reportable Concentrations specified in 310 CMR 40.1600, but that are not otherwise a RCRA hazardous waste as specified in 310 CMR 30.000. These soils may be disposed at locations: (1) determined acceptable by Harvard University; (2) where State and/or municipal (e.g. Board of Health, Conservation Commission and/or Building Department) approval has been obtained by the receiving facility to accept soils with ACM as well as other contaminant levels identified; and (3) where the concentrations of oil or hazardous material and asbestos meets the permit standards of the receiving facility.

   Facilities which may accept Group II-6 soils include: out-of-state lined solid waste (Subtitle D) landfills. These soils shall be transported only to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner. In addition to the Bureau of Waste Site Cleanup Bills of Lading (BOL), prepared by the Owner's LSP, transport of Group II-6 soils (ACM) from the site to appropriate off-site facilities shall be tracked using the Harvard University Asbestos Waste Shipment Record (AWSR).

C. GROUP III

Soils that contain oil or hazardous materials at concentrations greater than or equal to applicable RCS-1 release notification thresholds specified in 310 CMR 40.0300, and that meet the specific "characteristic" or "listed" hazardous waste criteria as defined in the "Massachusetts Hazardous Waste Regulations" (310 CMR 30.000). Group III soils are considered Hazardous Waste. The transportation and off-site management of Hazardous Waste is conducted in accordance with the Massachusetts Hazardous Waste Regulations. The transportation of Group II soils from the site to appropriate off-site facilities shall be tracked using a Uniform Hazardous Waste Manifest prepared by Owner's LSP. The off-site management of Group III hazardous waste shall be conducted only to an approved RCRA hazardous waste Treatment, Storage, Disposal Facilities (TSDFs) in accordance with federal and state regulations.

1. Group III-1: Material determined to contain "listed" or is a "characteristic" hazardous waste which cannot be treated on-site to result in the classification of the material as a non-hazardous waste.

   Facilities which may accept Group III-1 soils include: RCRA hazardous waste (Subtitle C) landfills, treatment facilities and incinerators. These soils shall only be transported and managed to off-site facilities identified on the "Harvard Utilized Facilities List" or to facilities which have been otherwise approved by the Owner.

2. Group III-2: Soils classified as hazardous waste that can be readily treated on-site to result in the classification of the material to a non-hazardous waste. Once treated and confirmed through testing, the material will be re-classified depending on other contaminants, and reused, recycled, treated or disposed of following the appropriate guidelines for Group II-2, II-3, II-4 or II-5.

D. GROUP IV

Solid waste materials that are located below grade and include granite blocks, asphalt, brick, concrete, reinforced concrete, timber piles, timber cribbing, steel sheeting, and miscellaneous rubble. Group IV materials are considered Solid Waste. The transportation and off-site management of the Solid Waste is conducted in accordance with the Massachusetts Solid Waste Management Regulations (310 CMR 16.00 and 310 CMR 19.000). The transportation of Group IV materials from the site to appropriate off-site facilities shall be tracked using a Materials Shipping Log. Solid waste materials shall be processed and recycled, or disposed, at MassDEP-permitted solid waste facilities. These materials do not include materials located at or above the ground surface including surface asphalt, surface concrete slabs, demolished building foundations, surface treatments, or solid waste exposed at ground surface. All

solid waste materials must be free of asbestos prior to processing, recycling or disposing.

1. Group IV-1: Coated or un-coated asphalt, brick and concrete (ABC) materials (both un-reinforced and reinforced). (It is noted that the processing, recycling and disposing of coated ABC materials required a Beneficial Use Determination.)

2. Group IV-2: Timber piles and cribbing, and other wood waste materials.

3. Group IV-3: Granite blocks, steel sheeting, and other miscellaneous rubble.

3.06 SOIL QUALITY MONITORING DURING EXCAVATION

A. Classification of excavated soils for on-site reuse or off-site disposal, reuse, recycling, and treatment shall be based on the pre-characterization program conducted by Harvard. Material located within the representative zone of the pre-characterization explorations shall be assumed similar in quality to the tested material and classification is based on the test results for the representative sample.

B. The Contractor shall coordinate all work with the Harvard Project Manager and Engineer. The Engineer will monitor excavation of soils. Soils will be monitored for visual and olfactory evidence of contamination based on observed discoloration, texture, and odor. In addition, excavated material will be monitored with a photoionization detector (PID) to screen for the presence of volatile organic compounds (VOCs). If conducted, screening will occur in the excavation area (ambient) and will be periodically performed through sampling the headspace of soils collected in jar samples. Ambient PID readings will be performed in the work zone and within 6 inches of the excavated material.

C. Soils will remain as classified based on the pre-characterization program unless field screening, field observations or additional chemical testing indicate the soils to be different from the pre-characterized classification. At the direction of the Engineer, the Contractor shall segregate and temporarily stockpile excavated soils if they are observed to be heavily stained or exhibit unusual odors. The Contractor shall arrange with the Engineer to have the soils tested and reclassified as necessary prior to off-site removal.

D. For Group I soils, Harvard's LSP will provide the appropriate shipping record for the various receiving facilities chosen by the Contractor and approved by the Harvard Project Manager. Group I soils shall not contain more than 20 percent asphalt, brick, concrete, wood or metal, in accordance with 310 CMR 19.017,

provided that the receiving facility will accept asphalt, brick, concrete, wood, or metal debris.

E. For Group II soils, Harvard's LSP will provide a Bill of Lading or as required for the various receiving facilities chosen by the Contractor and approved by the Harvard Project Manager. For Group II-6 soils containing asbestos materials, the Contractor shall also complete the Harvard University Asbestos Waste Shipment Record. Group II soils shall not contain more than 20 percent asphalt, brick, concrete, wood or metal, in accordance with 310 CMR 19.017.

F. For Group III materials, the Contractor shall prepare a Uniform Hazardous Waste Manifest. Group III soils shall not contain more than 20 percent asphalt, brick, concrete, wood or metal, in accordance with 310 CMR 19.017.

G. For Group IV materials, the Contractor shall establish a truck shipping record for off-site processing, recycling or disposal of materials. The shipping record must record the quantity and destination of the solid waste materials. Offsite recycling, reuse and/or salvage shall be conducted in accordance with 310 CMR 19.017.

3.07 TREATMENT OF GROUP III-2 SOILS

A. Group III-2 soils shall be treated in-place prior to excavation. The Engineer may allow the Contractor to treat soils following excavation provided the proposed means for treatment does not result in classification of the soil as a hazardous waste. In no case shall the treatment be conducted outside the limits of the project site.

B. Soils classified as Group III-2 shall be treated in accordance with the Contractor's approved treatment plan submittal.

3.08 MANAGEMENT OF ASPHALT, BRICK AND CONCRETE (ABC)

A. If large quantities (greater than 20%) of asphalt, brick or concrete (ABC) materials are found co-mingled with soils, the ABC debris shall be segregated and stockpiled for on-site or off-site management in accordance with Construction & Demolition Waste Management - Section 017419.

3.09 ASBESTOS MATERIALS/DEBRIS IN SOIL

A. If asbestos containing materials (ACM) are identified during the excavation, the Contractor shall terminate work in that area and immediately notify the Project Manager and Engineer.

B. The Harvard Project Manager or Engineer will notify the regulatory agency of the presence of ACM.

C. The Contractor shall obtain all required waivers, variances and exemptions from all applicable regulatory agencies and the off-site management of asbestos materials or debris in accordance with Asbestos Abatement and Related Work - Section 028200.

D. Asbestos materials or debris identified during the excavation process or found co-mixed with soils, shall be segregated and stockpiled away from the work area. The asbestos materials shall be placed on and covered with a polyethylene cover overlapped and weighted to form a continuous waterproof barrier over the material.

E. The Contractor shall prepare and submit to the Project Manager, for approval, a work plan that describes the methodology to be used to protect human health and the environment during all phases of load-out, transport and disposal of all asbestos-containing materials. This work plan will also be submitted to the MassDEP for approval. This work plan shall include, but not be limited to the following:

1. Harvard's Asbestos Monitor will conduct perimeter air sampling on all four sides of the work area during all active handling operations utilizing PCM to analyze a minimum of eight (8) air monitoring samples per 8-hour shift, and perform PCM analysis on-site to obtain real-time data (maintain data on-site). For 10% of the samples, TEM will be used to verify PCM results. Harvard's Asbestos Monitor shall stop work and notify MassDEP if fiber levels exceed 0.01 fibers/cc.
2. The Contractor shall use Certified and currently licensed Asbestos Abatement Contractor listed on the Harvard Approved Asbestos Contractor list located on the EHS website.
3. Loading Operations
    a. The Contractor shall keep soil containing Asbestos Containing Material wet during excavation, handling and loading so that no dust is generated. Prevent visible emissions during all operations.
    b. Routes from loading area to equipment decontamination area shall be clearly delineated (e.g., identified and marked) to avoid contamination spread.
    c. To the extent feasible, the Contractor shall use loading machinery that creates the least amount of soil disturbance (e.g., an excavator is preferable to a vacuum loader) and facilitates decontamination (e.g., tire vehicles are preferable to tracked vehicles).

d. The Contractor shall ensure that each truck has an HDPE liner placed beneath the truck and its tires. The liner shall extend outward so that no cross-contamination of site soils occurs during loading and handling operations. Any site soils which are subsequently cross-contaminated by the Contractor's operations, shall be removed and disposed at no cost to Harvard.

3. Packaging
   a. The Contractor shall line each container or truck with a polyethylene truck body liner that is at least 6 millimeters thick. Polyethylene liners shall be designed and sized for the container to be used and should be extended along the inside of the truck or container-bed gate to protect against contamination during loading and to facilitate decontamination. After loading, the liner shall be sealed.
   b. The Contractor shall cover each truck with high-density tie-down tarps.
   c. For containers of Asbestos Containing Waste Material (as defined at 310 CMR 7.00), the Contractor shall place labels on top of the sealed liner which states: a) "Asbestos Danger" and; b) identifies the name of the generator. In addition, the U.S. DOT asbestos placard (2212) shall be placed on all four vertical sides of the container or vehicle being used.

4. Decontamination
   a. The Contractor shall establish an equipment decontamination area and ensure that the decontamination pad for equipment is constructed to withstand use, in terms of weight of equipment, frequency of use, length of the job, etc. (e.g., multi-layer, with materials such as stone, EPDM-rubber roofing, hay bales, filters and pumps). The decontamination area shall be cleaned as needed, at a minimum at the end of every shift.

5. Transportation/Disposal
   a. The Contractor shall place labels note on top of the sealed liner which states: "Asbestos Danger" and identifies the name of the generator. In addition, the U.S. DOT asbestos placard (2212) shall be placed on all four vertical sides of the container or vehicle being used.
   b. Disposal of asbestos source materials shall be at a Harvard-approved asbestos disposal landfill. The Contractor is directed to the EHS webpage for a listing of approved landfills.
   c. The Contractor, transporter and landfill shall document generation, transport and disposal of the waste at the designated landfill by using a Bill of Lading and the Harvard University

Asbestos Waste Shipment Record (AWSR) to ship all asbestos source material generated from the site.

d. Soils contaminated with Asbestos Containing Material and one or more hazardous waste shall be managed as a hazardous waste in accordance with 310 CMR 30.000. The Uniform Hazardous Waste Manifest shall accompany off-site shipments of hazardous waste to the TSDF facility.

e. Prior to disposal, the Contractor shall collect and filter all water used in the decontamination process using a 5-micron filter and dispose of the filter as asbestos waste. Pre-filtration screening or pre-treatment should be implemented as needed to keep the 5-micron filter from clogging. Decontamination water that has been filtered with a 5-micron screen should be reused where possible. Disposal should be done in accordance with management plans for other wastewater generated by construction activities at the location.

3.10 TRANSPORTATION AND TREATMENT, STORAGE OR DISPOSAL OF HAZARDOUS WASTE SOILS

A. Group III (Hazardous Waste) soils shall be managed as a hazardous waste in accordance with the Massachusetts Hazardous Waste Management Regulations at 310 CMR 30.000.

B. The Contractor shall contract with a licensed hazardous waste transporter for the shipment of hazardous waste soils off-site to a RCRA-permitted TSDF facility. The Contractor shall ensure that the vehicles transporting hazardous materials off-site be clearly labeled and placarded in accordance with DOT requirements.

C. Group III (Hazardous Waste) soils shall be transported under the Uniform Hazardous Waste Manifest to an off-site RCRA-permitted Subtitle C facility identified on the Harvard-approved facilities list at the EHS website.

3.11 MATERIALS SHIPPING RECORD/BILL OF LADING/UNIFORM HAZARDOUS WASTE MANIFEST /HARVARD UNIVERSITY ASBESTOS WASTE SHIPMENT RECORD

A. The Harvard Project Manager will provide the services of an LSP to manage the off-site removal process including preparation of waste profiles, applicable Bills of Lading, Material Shipping records, Uniform Hazardous Waste Manifest and/or Harvard University Asbestos Waste Shipping Records.

B. The Harvard Project Manager will provide interaction with MassDEP, if required, and will forward the completed Bills of Lading to the MassDEP.

C. The Contractor shall complete the submittal process as outlined herein to the satisfaction of the Harvard Project Manager prior to removing any excavated soil or material from the site.

3.12 TRANSPORTATION OF EXCAVATED MATERIAL

A. The Contractor will be responsible for handling, re-handling, loading, transporting, and legal off-site removal of all excavated soils and materials to approved facilities.

B. The Contractor will be responsible for the scheduling and coordination of all shipments of the soils to the approved facilities. The Contractor shall coordinate directly with the designated approved facility to ensure that the soils are received by the facility on schedule and that there will be no cause for delay in Work.

C. The Contractor is responsible to ensure that the trucks gross weight meet DOT requirements and the requirements of the receiving facility.

D. No soil shall be removed from the site without prior approval from the Harvard Project Manager.

E. Excavated soils and materials removed from the site shall be loaded within the site limits. All trucks leaving the site shall be covered and cleaned of debris that might fall from the trucks during transport.

F. The Contractor shall install, operate, maintain and remove a wheel wash at each location where construction vehicles access and depart from the site. The location shall be proposed by the Contractor and approved by the Harvard Project Manager. Refer to Section 312500 – Erosion and Sedimentation Controls

G. The Contractor shall take measures to prevent debris from being spilled from trucks or tracked from the site onto local streets. The Contractor shall sweep streets adjacent to the site as necessary or as directed by the Harvard Project Manager.

H. The Contractor shall ensure that any vehicle transporting materials off-site are properly labeled and placarded in accordance with federal and state DOT requirements.

3.13 DUST, ODOR AND GAS CONTROL

A. The Contractor shall employ dust, odor, and gas control measures to minimize the creation of airborne dust, odors, and gases during the entire construction process. As a minimum, standard dust control techniques shall be employed where heavy equipment will be traveling, such as watering down the site or spreading hygroscopic salts. All measures shall be taken in accordance with the Contractor's approved Health and Safety Plan.

3.14 CONTINGENCIES

A. If potentially hazardous conditions develop during the course of the Work, the work in that specific area shall be terminated until the hazardous condition has been addressed to the Harvard Project Manager's satisfaction. Potentially hazardous conditions include, but are not limited to, encountering buried containers, tanks, or drums and unknown utilities soils saturated with oil and/or hazardous materials, floating product and ACMs.

B. The removal of buried underground storage tanks, containers, or drums shall be performed in accordance with the requirements of 520 CMR 9.00, Tanks and Containers and Section 026500 – Removal and Disposal of Storage Tanks, if applicable.

C. In the event that buried containers, drums, or tanks are encountered or if a release of oil or potentially hazardous materials has occurred, the Contractor shall notify the Harvard Project Manager immediately. The Contractor shall secure the area to prevent health risks to workers or the public and releases into the environment. The sources of the event causing the material to be considered suspect will be evaluated by the Harvard Project Manager. The Harvard Project Manager will notify MassDEP Incident Response within the required reporting time period (MassDEP Emergency Notification 888-304-1133 or 617-292-5500) as required. The Harvard Project Manager will also notify site appropriate Fire Department's (i.e., City of Cambridge or City of Boston) and State Fire Marshal's office upon discovery of the tank or buried container. The Contractor shall obtain permission and permits for the removal of buried storage tanks.

D. The impact on the work should be evaluated and, if necessary, the Contractor's Health and Safety Program should be revised in response to the unforeseen conditions.

E. The Engineer may determine that confirmatory testing is necessary following excavation. The Contractor is informed that such testing may cause a delay (up to 48 to 96 hours) in completing the project.

F. If the Contractor causes a release to the environment, the Contractor is responsible for all required reporting, remediation and closeout in response to the release in accordance with all applicable laws and regulations. The Contractor

shall notify the Harvard Project Manager immediately upon discovery and discuss with EH&S and the Contractor the reporting requirements. The Harvard Project Manager shall receive copies of all correspondence from the Contractor. The Project Manager may engage an LSP to provide oversight of the Contractor's cleanup activities.

PART 4 – MEASUREMENT AND PAYMENT

4.01 **[THE FOLLOWING SECTION SHALL APPLY TO AND BE SPECIFIED WHERE THE CONTRACTOR IS CONTRACTING FOR SOILS EXCAVATION AND HANDLING, TRANSPORTATION AND THE OFF-SITE REUSE, RECYCLING, TREATMENT AND/OR DISPOSAL OF SOIL MATERIALS.]**

A. Unit Quantities: Quantities and measurements indicated in the Bid Form are for Contract bidding purposes only. Actual project quantities will determine payment modifications. Unit price work will be paid in accordance with Contract unit prices and quantities documented by the Contractor and approved by the Engineer. Whole unit prices or fractions thereof that are not used during the course of the work shall results in a credit to Harvard University. Certified weight receipts or any other receipts or documentation are required to document quantities subject to unit pricing. Payments shall be made only for quantities where the Harvard Project Manager and Engineer have verified copies of receipts (e.g. weight slips) from hauling vehicles entering or leaving the Site. These unit prices will be used to add to or deduct from the dollar amounts shown, depending on whether the actual amount is greater or less than the estimated amount.

B. Original Bill of Lading, Generator's copies of any Manifests and waste Shipment Records, and supporting documentation for contaminated material handling, transportation and disposal, must be submitted to the Harvard Project Manager prior to payment for contaminated material handling, transportation and disposal. Following Engineer's verification of quantifies, the Harvard Project Manager will issue Contract modifications to adjust the total Contract price to reflect actual final quantities of unit price work.

C. For each of the categories identified on Table 1, the Contractor shall identify one primary and one secondary reuse, recycling, treatment and/or disposal facility. The primary facility shall be identified as 1. and the secondary facility as 2.

D. The Contractor shall provide unit prices (per ton) for the materials listed in each subgroup classification provided on Table 1. The unit prices (per ton) provided herein shall include all costs for labor, materials, equipment, documentation, material procurement, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, preparation of required documentation (e.g., letters to and from facilities), and

direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility) and screening; (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility; and (3) all tipping fees, taxes and surcharges for the reuse, recycling, treatment and/or disposal at the off-site facility. The Contractor is responsible to provide separate unit prices for each soil category identified on Table 1 and for which an estimated volume is provided.

E. No separate measurement or payment will be made for excavation and on-site handling, re-handling, screening and segregation of soil materials which will be managed or reused on-site; filling; construction and removal of vehicle wheel wash; management; stockpiling; emission control measures; equipment; police detail; surveying; dust monitoring; dust control; and work listed in other specification sections or other associated items or work considered incidental to the work of this Section.

F. The process to achieve approval at a disposal facility and prepare the required paperwork and/or conduct any additional chemical testing requested by the Contractor-proposed facility shall be included in the scheduling and estimating of the project.

G. [No separate measurement and payment will be made for the off-site removal and disposal of <u>non-coated</u> demolished existing brick and concrete building elements including reinforced concrete foundation and walls.]

H. Measurement of the material groups transported from the site to the various receiving facilities will be per ton measured by scale at the receiving facility to the nearest 0.1 ton. If the receiving facility does not have a scale, the Contractor shall either: (1) install a portable scale at the project site or, (2) identify an off-site scale to be used for the measurement of the truck load. In the event the Contractor selects an off-site scale, the Contractor shall provide, within 30 days of shipment, the scale location, name of the scale owner/operator, type of scale, and certification by an independent testing firm in support of the most recent (within one year) testing and balancing of the scale. Quantities of each subgroup will be measured and paid separately. The Contractor shall provide weight slips prior to payment being processed.

I. For Group III-2 (Hazardous Waste) soils, the Contractor shall provide individual unit prices (per ton) for all labor, materials, equipment, documentation, material procurement, permits, confirmatory testing demonstrating successful treatment of the Group III-2 soils, management and coordination with the off-site receiving

facility, coordination with Harvard EH&S and the Project LSP, preparation of required documentation (e.g., letters to and from facilities), and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility) and screening, and on-site treatment operations; (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility; and (3) all tipping fees, taxes and surcharges for the reuse, recycling, treatment and/or disposal at the off-site facility. The Contractor is responsible to provide separate unit prices for one primary and one secondary facility for the pre-treated Group III-2 soils.

J. For Group III-1 (Hazardous Waste) soils, the Contractor shall provide individual unit prices (per ton) for all labor, materials, equipment, documentation, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, preparation of required documentation (e.g., letters to and from facilities), and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility) and screening; (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility; and (3) all tipping fees, taxes and surcharges for the reuse, recycling, treatment and/or disposal at the off-site facility. The Contractor shall identify and provide unit prices for one primary and one secondary disposal and incineration facility to be used for the off-site management of hazardous waste materials. The final destination (i.e. incineration or disposal) for Group III-1 soils will be determined by the Harvard Project Manager.

K. For Group IV (Solid Waste) materials, the Contractor shall provide individual unit prices (per ton) for all labor, material, equipment, documentation, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, preparation of required documentation (e.g., letters to and from facilities), and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility) and screening; (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility; and (3) all tipping fees, taxes and surcharges for the reuse, recycling, treatment and/or disposal at the off-site facility. The Contractor shall identify one primary reuse/recycling and disposal facility and one secondary reuse/recycling and disposal facility to be used for the off-site management of solid waste materials.

The final destination (i.e. reuse, recycling, or disposal) for Group IV Solid Waste materials will be determined by the Harvard Project Manager.

L. [The Contractor shall provide a unit price (daily rate) to advance test pits from which additional soil samples would be obtained by the Harvard Project Manager's LSP. The unit price shall include all labor, materials, equipment, incidentals, direct and indirect expenses, and coordination with the Harvard Project Manager's LSP to complete the test pit.]

M. [The Contractor shall provide a unit price (per ton) for the transportation and unloading of soil to an off-site temporary stockpile location as designated by the Project Manager. Work under this item includes all Contractor costs to: excavate, handle, re-handle, load, segregate, track, and transport soils to an off-site temporary storage location. Unit price shall include all labor, materials, equipment, incidentals, direct and indirect expenses to excavate, transport and unload soils at a location designated by the Harvard Project Manager. For budgetary purposes, the Contractor shall assume that the stockpile area is located within [30] miles of the Project site.]

N. A Contract modification will be issued by Harvard to adjust the Contract price resulting from the final quantities of the unit price work.

4.02 **[THE FOLLOWING SECTIONS SHALL APPLY TO AND BE SPECIFIED WHERE HARVARD IS CONTRACTING DIRECTLY WITH THE OFF-SITE SOILS REUSE, RECYCLING, TREATMENT AND/OR DISPOSAL FACILITIES, AND THE CONTRACTOR IS ONLY RESPONSIBLE FOR THE SOILS EXCAVATION AND HANDLING, AND TRANSPORTATION OF THE SOILS TO THE IDENTIFIED FACILITIES.]**

A. Unit Quantities: Quantities and measurements indicated in the Bid Form are for Contract bidding purposes only. Actual project quantities will determine payment modifications. Unit price work will be paid in accordance with Contract unit prices and quantities documented by the Contractor and approved by the Engineer. Whole unit prices or fractions thereof that are not used during the course of the work shall results in a credit to Harvard University. Certified weight receipts or any other receipts or documentation are required to document quantities subject to unit pricing. Payments shall be made only for quantities where the Harvard Project Manager and Engineer have verified copies of receipts (e.g. weight slips) from hauling vehicles entering or leaving the Site. These unit prices will be used to add to or deduct from the dollar amounts shown, depending on whether the actual amount is greater or less than the estimated amount.

B. Original Bill of Lading, Generator's copies of any Manifests and waste Shipment Records, and supporting documentation for contaminated material handling, transportation and disposal, must be submitted to the Harvard Project Manager

prior to payment for contaminated material handling, transportation and disposal. Following Engineer's verification of quantifies, the Harvard Project Manager will issue Contract modifications to adjust the total Contract price to reflect actual final quantities of unit price work.

C. The Contractor shall provide unit prices (per ton) for the material listed in the subgroup classifications as provided on Table 1. The unit prices (per ton) provided herein shall include all costs for: labor, materials, equipment, documentation, material procurement, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility) and screening; and (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility. The Contractor shall provide separate unit prices for each soil category identified on Table 1 and for which the facilities and estimated volume is provided. The receiving facility will be contracted by and paid directly Harvard University.

D. No separate measurement or payment will be made for excavation and on-site handling, re-handling, screening and segregation of soil materials will be managed or reused on-site, filling; construction and removal of vehicle wheel wash; management; stockpiling; emission control measures; equipment; police detail; surveying; dust monitoring; dust control; and work listed in other specification sections or other associated items or work considered incidental to the work of this Section.

E. No separate measurement and payment will be made for the off-site removal and disposal of non-coated demolished existing brick and concrete building elements including reinforced concrete foundation elements**.**

F. Measurement of the material groups transported from the site to the various receiving facilities will be per ton measured by scale at the receiving facility to the nearest 0.1 ton. If the receiving facility does not have a scale, the Contractor shall either: (1) install a portable scale at the project site or, (2) identify an off-site scale to be used for the measurement of the truck load. In the event the Contractor selects an off-site scale, the Contractor shall provide, within 30 days of shipment, the scale location, name of the scale owner/operator, type of scale, and certification by an independent testing firm in support of the most recent (within one year) testing and balancing of the scale. Quantities of each subgroup will be measured and paid separately. Weight slips shall be provided prior to payment being processed.

G. For Group III-2 (Hazardous Waste) soils, the Contractor shall provide individual unit prices (per ton) for all labor, materials, equipment, documentation, material procurement, permits, confirmatory testing demonstrating successful treatment of the Group III-2 soils, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility), screening, and on-site treatment operations; and (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility. The Contractor shall provide separate unit prices for the management of Group III-2 Hazardous Waste Soils to each of the identified facilities on Table 1. The receiving facility will be contracted and paid directly by Harvard University.

H. For Group III-1 (Hazardous Waste) soils, the Contractor shall provide individual unit prices (per ton) for all labor, materials, equipment, documentation, material procurement, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility), screening, and on-site treatment operations; and (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility. The Contractor shall provide separate unit prices for the management of Group III-2 Hazardous Waste Soils to each of the identified facilities on Table 1. The final destination (i.e. incineration or disposal) for Group III-1 soils will be determined by the Harvard Project Manager. The receiving facility will be contracted by and paid directly Harvard University.

I. For Group IV (Solid Waste) materials, the Contractor shall provide individual unit prices (per ton) for all labor, materials, equipment, documentation, material procurement, permits, management and coordination with the off-site receiving facility, coordination with Harvard EH&S and the Project LSP, and direct and indirect expenses of the Contractor and Subcontractors. Unit prices shall be individually provided for: (1) excavation, handling, re-handling, loading, segregation including any and all necessary work to reduce the size and volume of the debris (e.g., hoe-ramming concrete to a size acceptable for trucking and/or for the disposal facility), screening, and on-site treatment operations; and (2) all transportation fees, taxes and surcharges and expenses required to transport the material from the project site to the receiving facility. The Contractor shall provide separate unit prices for the management of Group IV Solid Waste

Materials to each of the identified facilities on Table 1. The final destination (i.e. incineration or disposal) for Group IV Solid Waste will be determined by the Harvard Project Manager. The receiving facility will be contracted by and paid directly Harvard University.

J. [The Contractor shall provide a unit price (hourly rate) to advance test pits from which additional soil samples would be obtained by the Harvard Project Manager's LSP. The unit price shall include all labor, materials, equipment, incidentals, direct and indirect expenses, and coordination with the Harvard Project Manager's LSP to complete the test pit.]

K. [The Contractor shall provide a unit price for the transportation and unloading of soil to an off-site temporary stockpile location as designated by the Project Manager. Work under this item includes all Contractor costs to: excavate, handle, re-handle, load, segregate, track, and transport soils to an off-site temporary storage location. Unit price shall include all labor, materials, equipment, incidentals, direct and indirect expenses to excavate, transport and unload soils at a location designated by the Harvard Project Manager. For budgetary purposes, the Contractor shall assume that the stockpile area is located within [30] miles of the Project site.]

L. A Contract modification will be issued by Harvard to adjust the Contract price resulting from the final quantities of the unit price work.

TABLE 1
Excavated Soil and Off-Site Management Costs

PROJECT NAME
Harvard University

Material Type	Name of Facility	Estimated Quantity (tons)	Net Unit Price		Total Cost ($)
			Transportation (per ton)	Reuse/ Disposal (per ton)	
I-1: Naturally-Deposited Soils - No Detectable contaminants	1.				
	2.				
I-2: Non-Reportable Naturally-deposited Soils	1.				
	2.				
I-3: Non-Reportable Urban Fill Soils	1.				
	2.				
I-4: Excavated material from slurry wall, LBE, and caissons	1.				
	2.				

TABLE 1
Excavated Soil and Off-Site Management Costs

PROJECT NAME
Harvard University

Material Type	Name of Facility	Estimated Quantity (tons)	Net Unit Price		Total Cost ($)
			Transportation (per ton)	Reuse/ Disposal (per ton)	
Group II – Reportable Soils					
II-2: In-State, Lined Landfill (Subtitle D)	1.				
	2.				
II-3: In-state, Recycling	1.				
	2.				
II-4: Regional Recycling or Treatment	1.				
	2.				
II-5/II-6: Regional Disposal, Lined Landfill (Subtitle D)	1.				
	2.				

TABLE 1
Excavated Soil and Off-Site Management Costs

PROJECT NAME
Harvard University

Material Type	Name of Facility	Estimated Quantity (tons)	Net Unit Price		Total Cost $
			Transportation (per ton)	Disposal/ Treatment (per ton)	
III-1: Hazardous Waste – RCRA landfill	1.				
	2.				
III-1: Hazardous Waste – Incineration	1.				
	2.				
III-2: **Hazardous Waste - On-site Treatment, declassification to Group II**	1.				
	2.				

TABLE 1
Excavated Soil and Off-Site Management Costs

PROJECT NAME
Harvard University

Material Type	Name of Facility	Estimated Quantity (tons)	Net Unit Price			Total Cost ($)
			Excavation/ Handling	Transportation (per ton)	Reuse/ Disposal (per ton)	
Group V – Solid Waste						
V-1: Asphalt, Brick, and Concrete Materials						
a. Non-Coated ABC						
b. Coated ABC						
V-2: Timber Piles and Cribbing and other Wood Waste						
V-3: Granite Blocks, Steel Sheeting, Misc. Rubble						