

F-0439  
October 30, 2019

Brian Carey  
Conservation Director  
Fairfield Conservation Department  
Sullivan Independence Hall  
725 Old Post Road  
Fairfield, Connecticut 06824

Re: **Remedial Action Plan  
Burroughs Park**

## Summary

- **Timeline:** Remediation activity will start in mid-November and is expected to be completed by the end of the month depending on weather and site conditions.
- **Remediation Details:** Impacted soils will be removed by excavation and disposed of offsite at certified disposal facility located in Minerva, New York. Air monitoring will be performed daily during all excavation work. The site-specific Health and Safety Plan (HASP) details the appropriate level of Personal Protection Equipment required for site works.
- **Site Restoration:** The excavated areas will be appropriately backfilled to grade with certified clean soils once all post excavation confirmatory soil samples have been determined to have no exceedances by laboratory analysis and qualified data review.
- **Remedial Action Report:** At the completion of the project, a Remedial Action Report will be prepared documenting the remedial activities that were completed at the site.

The following is the Remedial Action Plan (RAP) for Burroughs Park (the site). The area targeted for remediation consists of the shallow soils located adjacent to one goalie area on a soccer field.

## Previous Environmental Investigations

Tighe & Bond conducted investigations in August and September 2019 consisting of the installation of approximately 28 hand test pits. Tighe & Bond also observed the characteristic of soil during sampling for presence of fill materials and asbestos containing materials. Approximately 28 samples were collected for the analysis of arsenic, lead, Extractable Total Petroleum Hydrocarbons (ETPH), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and/or asbestos in building materials and soil.

A summary of the results of Tighe & Bond's investigation is provided in Table 1. Included in the summary is a comparison to the CT Remediation Standard Regulations (RSRs). When sites are enrolled in a CT Cleanup Program or when a Consent Order is in place, the RSRs are the default cleanup criteria. The site is currently not enrolled in a Program nor is it under an Order so the RSRs have been used as general guidance for determining remediation requirements. Also included in Table 1 is a comparison to the US Environmental Protection Agency (EPA) standard of 1% for asbestos. Exceedances of RSR cleanup criteria



and EPA asbestos standard are shown on Figure R-100. Only one sample was found to have an exceedance of asbestos.

## **Remediation Plan**

The recommended approach for remediation of shallow soils at the site is through excavation and disposal at an off-site facility. This approach was discussed with the CT Department of Public Health (DPH) and DEEP. Excavation will be conducted by a CT-licensed asbestos abatement company. Soil will be disposed of at a facility permitted to accept the contaminants detected at the site.

Impacted soil and fill will be removed to the limits shown on Figure R-100 and based on visual observations of fill in the field. Upon completion of soil and fill removal, post-excavation soil samples will be collected for analysis of asbestos from the sidewalls and bottom of the excavations on a 20-ft interval. Removal of asbestos containing material will be based on visual observations.

## **Project Specifications**

Tighe & Bond has prepared Project Specifications that are part of the Contract Documents between the Town of Fairfield and the selected Remediation Contractor. These specifications provide the technical requirements that the Contractor must follow during remediation and include the following:

- Section 01 35 00 – Site Specific Health & Safety Plan
- Section 02 61 00 – Excavation and Handling of Contaminated Soil
- Section 02 81 00 – Transportation and Disposal of Contaminated Soil
- Section 31 00 00 – Backfill, Compaction and Dewatering
- Section 32 90 03 – Lawns and Grasses

These specifications are included in Appendix A.

## **Air Monitoring**

Tighe & Bond will conduct daily total particulate (dust) air monitoring using real time monitors at two locations up and down wind of the work area to document the Contractor's use of appropriate dust controls and their effectiveness. This will be accomplished using two monitoring units, conduct real-time monitoring of dust levels during soil remediation using TSI DUSTTRAK 8530 air monitoring instruments and Netronix Thiamis 1000 telemetry units (or equivalent) to determine if levels are below those specified in the Project Specifications. Each monitor will be equipped with a wireless telemetry system capable of sending alerts to the project monitor's cellular telephone using a web-based application should the Action Level be exceeded. Field observation time will include on-site time to set up, take down, and download data from the monitors. Set up will take place prior to the start of active soil excavation / asphalt removal each day. Monitors will be taken down and data downloaded at the end of each day after work is stopped. If the downwind airborne particulate levels exceed those allowable as per the Contract Documents or if airborne dust is observed leaving the work area, then additional dust suppression techniques must be employed by the Contractor. If, after implementation of dust suppression techniques, downwind particulate levels are still above levels specified in the Contract Documents, work must be stopped, and a re-evaluation of activities initiated by the Contractor.

A State of Connecticut licensed Asbestos Project Monitor (APM) will perform full time air monitoring at the excavation area as requested by the CT Department of Health (DPH). The APM will perform pre-commencement visual inspections of each work area to evaluate if the work area preparation is performed in accordance with applicable regulations, variances

and the technical specifications. Progress inspections will be performed within the work areas to evaluate the Contractor's compliance with applicable regulations and the Contract Documents. The APM will maintain daily log notes, work area check lists, containment inspection logs, and waste loadout logs. Final visual inspections will be completed following the completion of final cleaning to evaluate if the work area meets the "no visible residue" criteria. Asbestos final air clearance samples will be analyzed by Phase Contrast Microscopy (PCM). Tighe & Bond is an accredited American Industrial Hygiene Association (AIHA) member and a State of Connecticut Department of Public Health (CTDPH) approved lab. The APM will analyze the PCM background and PCM final air clearance samples onsite.

## **Remedial Action Report**

At the completion of field activities, Tighe & Bond will prepare a Remedial Action Report (RAR) to document cleanup efforts. Tighe & Bond will follow up with the Contractor for missing or incomplete documentation and match quantities of unit priced wastes hauled from the site with that received at the landfill. The report will include records required to be kept by the Town documenting the proper removal and disposal of wastes during the remediation project. The report will also include a summary and discussion of the dust monitoring and air sampling data.

If you have any questions or comments, please contact me at (860) 704-4761 or [jtolsen@tighebond.com](mailto:jtolsen@tighebond.com).

Regards,

**TIGHE & BOND, INC.**



James T. Olsen, PG, LEP  
Vice President

### Enclosures:

Table 1 – Summary of Analytical Data

Figure R-100 – Exceedance Summary and Soil Excavation Plan

Appendix A – Project Specifications

**TABLE 1**  
**BORROUGH PARK**  
Summary of Soil Sample Analytical Data  
Fairfield, Connecticut  
Last Updated: 09/12/2019

Sample ID	CT RSR Criteria		US EPA	BP S1	BP S2	BP S3	BP S5	PACM-BP-BURS-S7	PACM-BP-S5-B-1	PACM-BP-S5-B-2	PACM-BP-S5-F	PACM-BP-S5-G-1	PACM-BP-S5-G-2	PACM-BP-S5-L-1	PACM-BP-S5-L-2	PACM-BP-S5-N	BP S6	BP S7	BP S8	BP S9
Sample Depth	RES DEC	GB PMC		0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	S5 Area	9/10/19	9/10/19	9/10/19	9/10/19	9/10/19	9/10/19	9/10/19	9/10/19	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT
Sample Date				8/23/19	8/23/19	8/23/19	8/23/19	-0009	-0001	-0002	-0003	-0004	-0005	-0006	-0007	-0008	8/23/19	8/23/19	8/23/19	8/23/19
Lab Sample ID				CD91932	CD91933	CD91934	CD91935										CD91936	CD91937	CD91938	CD91939
Asbestos in Material by PLM <sup>1</sup>	NA	NA	1%	-	-	-	-	15%	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-
Asbestos PLM 198.1 <sup>2</sup>																				
% Amosite	NA	NA	NA	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%
% Chrysotile	NA	NA	NA	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%
% Other	NA	NA	NA	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%
% Total Asbestos	NA	NA	1%	0.0%	0.0%	0.0%	0.0%	-	-	-	-	-	-	-	-	-	0.0%	0.0%	0.0%	0.0%
Total Metals 6010D																				
Arsenic	10	NA	NA	4.82	4.84	4.94	4.82	-	-	-	-	-	-	-	-	-	6.24	5.42	4.84	6.75
Lead	400	NA	NA	32.8	24.1	33.3	25.3	-	-	-	-	-	-	-	-	-	25.1	24.6	23	23.5
CTETPH 8015D (mg/Kg)	500	2500	NA	<62	<60	<60	<59	-	-	-	-	-	-	-	-	-	<63	<59	<58	<63
PCBs SW8082A (mg/Kg)																				
PCB-1016	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1221	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1232	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1242	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1248	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1254	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1260	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1262	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
PCB-1268	NE	NA	NA	<0.42	<0.39	<0.39	<0.4	-	-	-	-	-	-	-	-	-	<0.42	<0.39	<0.39	<0.41
Total PCBs	1	NA	NA	<0.42	<0.39	<0.39	<0.4										<0.42	<0.39	<0.39	<0.41
PAHs SW8270D (mg/Kg)																				
2-Methylnaphthalene	270	5.6	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Acenaphthene	1,000	84	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Acenaphthylene	1,000	84	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Anthracene	1,000	400	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Benz(a)anthracene	1	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Benzo(a)pyrene	1	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Benzo(b)fluoranthene	1	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Benzo(ghi)perylene	8.4	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Benzo(k)fluoranthene	8.4	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Chrysene	84	1	NA	<0.29	<0.27	<0.27	0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Dibenz(a,h)anthracene	1	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Fluoranthene	1,000	56.0	NA	<0.29	<0.27	<0.27	0.39	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Fluorene	1,000	56.0	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Indeno(1,2,3-cd)pyrene	1	1	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Naphthalene	1,000	56.0	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Phenanthrene	1,000	40	NA	<0.29	<0.27	<0.27	<0.27	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29
Pyrene	1,000	40	NA	<0.29	<0.27	<0.27	0.4	-	-	-	-	-	-	-	-	-	<0.29	<0.27	<0.28	<0.29

CTDEEP RSRs- Connecticut Department of Energy and Environmental Protection Remediation Standard Regulations (June 27, 2013)  
RES DEC-Residential Direct Exposure Criteria  
GB PMC- Pollutant Mobility Criteria in a GA groundwater area  
NE- Not established  
NA- Not Applicable  
CT ETPH- Connecticut Department of Public Health Extractable Total Petroleum Hydrocarbons  
PAHs- Polycyclic Aromatic Hydrocarbons  
PCBs- Polychlorinated Biphenyls  
< xx indicates compound was not detected. Detection limit is provided.  
Boxed values indicate exceedances of RES DEC  
Grey shaded values indicate exceedances of GB PMC  
ND- None Detected  
1- Asbestos analysis of Bulk Materials via EPA 600/R-93/116 Method Using Polarized Light Microscopy at EMSL Analytical.  
2- Asbestos analysis of Bulk Materials via 40 CFR Part 763, Sub. E, App. E/NYS-DOH 198.1 (PLM) by Eastern Analytical Services, Inc.

TABLE 1  
BORROUGH PARK  
Summary of Soil Sample Analytical Data  
Fairfield, Connecticut  
Last Updated: 09/12/2019

Sample ID	CT RSR Criteria		US EPA	BURS-S1	BURS-S2	BURS-S3	BURS-S4	BURS-S4A	BURS-S5	BURS-S6	BURS-S6A	BURS-S8	BURS-S9	BURS-S9A
Sample Depth	RES DEC	GB PMC		0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT	0-0.5 FT
Sample Date				Parking Area	Lower Soccer Field	S9 Area	S8 Area	S9 Area	S9 Area	S5 Area	S5 Area	S5 Area	Upper Field S6	Upper Field S6
Lab Sample ID				-0001	-0002	-0003	-0004	-0005	-0006	-0007	-0008	-0010	-0011	-0012
Asbestos in Material by PLM <sup>1</sup>	NA	NA	1%	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Asbestos PLM 198.1 <sup>2</sup>														
% Amosite	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-
% Chrysotile	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-
% Other	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-
% Total Asbestos	NA	NA	1%	-	-	-	-	-	-	-	-	-	-	-
Total Metals 6010D														
Arsenic	10	NA	NA	-	-	-	-	-	-	-	-	-	-	-
Lead	400	NA	NA	-	-	-	-	-	-	-	-	-	-	-
CTETPH 8015D (mg/Kg)	500	2500	NA	-	-	-	-	-	-	-	-	-	-	-
PCBs SW8082A (mg/Kg)														
PCB-1016	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1221	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1232	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1242	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1248	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1254	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1260	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1262	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
PCB-1268	NE	NA	NA	-	-	-	-	-	-	-	-	-	-	-
Total PCBs	1	NA	NA											
PAHs SW8270D (mg/Kg)														
2-Methylnaphthalene	270	5.6	NA	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	1,000	84	NA	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	1,000	84	NA	-	-	-	-	-	-	-	-	-	-	-
Anthracene	1,000	400	NA	-	-	-	-	-	-	-	-	-	-	-
Benz(a)anthracene	1	1	NA	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	1	1	NA	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	1	1	NA	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	8.4	1	NA	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	8.4	1	NA	-	-	-	-	-	-	-	-	-	-	-
Chrysene	84	1	NA	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	1	1	NA	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	1,000	56.0	NA	-	-	-	-	-	-	-	-	-	-	-
Fluorene	1,000	56.0	NA	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	1	1	NA	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	1,000	56.0	NA	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	1,000	40	NA	-	-	-	-	-	-	-	-	-	-	-
Pyrene	1,000	40	NA	-	-	-	-	-	-	-	-	-	-	-

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1- Asbestos analysis of Bulk Materials via EPA 600/R-93/116 Method Using Polarized Light Microscopy at EMSL Analytical.  
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BUR S7 (Near BP S5)		
Parameter	Concentration	Exceedance
Asbestos in Material by PLM	15%	US EPA

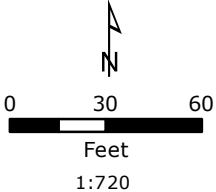
Excavate 1 ft as directed by engineer.

R-100  
EXCEEDANCE  
&  
EXCAVATION

LEGEND

- Approximate Sample Location
- Non-Soil Sample
- Excavation Areas
- Approximate Site Parcel
- Approximate Parcel Boundary

LOCUS MAP



NOTES

1. Based on 2016 Statewide Orthophotography, Courtesy of CTECO.

Burroughs Park  
940 Burroughs Road  
Fairfield, Connecticut

October 2019

**Tighe&Bond**  
Engineers | Environmental Specialists





SECTION 01 35 00

HEALTH & SAFETY PLAN

PART 1 GENERAL

1.1 SUMMARY

A. The Contractor shall:

1. Develop a site-specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered at the work site. The HASP shall include the information described in this specification (as applicable) and meet all applicable OSHA requirements.
2. Furnish all labor, equipment, materials, and employee training for effective implementation of the HASP and worker health and safety protection of all Contractor personnel.
3. Furnish all labor, equipment, materials, and employee training to effectively complete any required air monitoring and/or decontamination.
4. Review the requirements and data provided for the project and supplement the HASP with any additional measures deemed necessary to fully comply with applicable regulatory requirements and to adequately protect personnel on the site.
5. Maintain a copy of the HASP at the worksite, accessible to employees working at the site.
6. Post the emergency response plan section of the HASP, inclusive of emergency alerting and response procedures and directions to the nearest hospital, in a visible location for all workers to see.

1.2 SITE-SPECIFIC PROJECT CONDITIONS

- A. The Contractor shall review and understand all existing information as it relates to potential exposure to subsurface site contaminants, environmental data and reports. Reference Table 1 (Summary of Analytical Data) and R-100 (Exceedance Summary) for copies of applicable environmental data.
- B. The Contractor shall review and understand all existing information as it relates to potential exposure to hazardous structure/building materials (i.e., asbestos, polychlorinated biphenyls (PCBs), lead paint, and oil/hazardous materials containers). Site-specific information with respect to potential exposures to hazardous structure/building materials are included in applicable technical specifications contained herein. See applicable Sections 02 61 00 and 02 81 00 for applicable environmental data.
- C. The nature of the materials present at the site may require use of special protective clothing and the possible use of respiratory protective equipment, which is intended to help minimize worker exposure to known or suspected site hazards.



1. Levels of personal protection are established in reference standards and generally described for Levels C and D herein. It is anticipated that a majority of the Work to be performed on this project may be performed at Personnel Protection Level D.
2. The Contractor shall be responsible for determining if a higher level of personnel protection is required based on the criteria outlined in the Contractor's HASP. In the event that the Contractor determines that a level of protection higher than Level D is required, the Contractor's personnel shall take the necessary steps outlined in the Contractor's HASP.
3. The Contractor shall notify the Engineer and Owner in writing prior to implementing any upgrades in personal protection. The Engineer will review the Contractor's notification and determine the need to notify other applicable agencies.

### 1.3 REFERENCES

- A. OSHA 29 CFR Part 1910 (General Industry standards)
- B. OSHA 29 CFR Part 1926 (Construction Standards)
- C. OSHA Regulation 29 CFR §1910.120 (HAZWOPER) and OSHA Regulation 29 CFR §1926.65 (HAZWOPER)
- D. OSHA Regulation 29 CFR §1926.62 (Lead)

### 1.4 DEFINITIONS

- A. CHMM: Certified Hazardous Materials Manager, as certified by the Institute of Hazardous Materials Management.
- B. CIH: Certified Industrial Hygienist, as certified by the American Board of Industrial Hygiene®.
- C. CSP: Certified Safety Professional, as certified by the Board of Certified Safety Professionals.
- D. Site Safety and Health Official (SSHO): The individual located at a job site who is responsible to the Contractor and has the authority and knowledge necessary to implement the HASP and verify compliance with applicable safety and health requirements.
- E. HAZWOPER: Hazardous waste operations and emergency response (HAZWOPER) standards, per the Occupational Safety and Health Administration's (OSHA's) 29 CFR §1910.120 and 29 CFR §1926.65 regulations.
- F. Regulated clean-up site: A site regulated under OSHA's HAZWOPER standards contained in 29 CFR §1910.120 and 29 CFR §1926.65, inclusive of the following:
  1. Clean-up operations required by a governmental body, whether federal, state, local or other involving hazardous substances that are conducted at uncontrolled hazardous waste sites,
  2. Corrective actions involving clean-up operations at sites covered by the Resource Conservation and Recovery Act of 1976 (RCRA), and

3. Voluntary clean-up operations at sites recognized by federal, state, local or other governmental bodies as uncontrolled hazardous waste sites.
- G. Uncontrolled Hazardous Waste Site: An area identified as an uncontrolled hazardous waste site by a governmental body, whether federal, state, local or other where an accumulation of hazardous substances creates a potential threat to the health and safety of individuals or the environment or both.

## 1.5 SUBMITTALS

### A. Informational Submittals

1. Submit the following within thirty (30) days after the Effective Date of the Agreement.
  - a. A site-specific HASP, including the information described in this Specification as applicable.
    - 1) The HASP must be reviewed, approved, and signed by a CSP, CIH, or CHMM.
    - 2) The HASP must be reviewed, approved, and signed by Contractor representative, with specific responsibility for safety for the Contracting company.
    - 3) The Engineer's review is only to determine if the HASP is consistent with basic regulatory requirements and the minimum requirements of this specification. Engineer has no control over contractor's health & safety and the means and methods of health & safety implementation. Engineer also does not perform health & safety monitoring of contractor's work.
    - 4) The review will not determine the adequacy of the HASP to address all potential hazards, as that remains the sole responsibility of the Contractor.
  - b. Documentation of qualifications and experience of the SSHO.
  - c. Applicable health and safety training records.

## 1.6 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor, vendors/manufacturers, site visitors and anyone directly or indirectly employed by any of them.
- B. Provide a designated SSHO for the project.
- C. Pre-arrange emergency medical care services at a nearby hospital or medical clinic, including establishment of an emergency notification process and emergency routes of travel.
- D. Conduct pre-entry and weekly safety meetings with all site personnel, documenting attendance and topics covered.

- E. Develop and implement the site-specific HASP, inclusive of the elements in contained in this specification.
- F. For projects where contaminated media are known, likely, or suspected to be encountered:
  - 1. Monitor air quality in and around the work area using appropriate air monitoring equipment.
  - 2. Develop and implement a respiratory protection program per 29 CFR §1910.134 and 29 CFR §1926.103 for all workers authorized to wear respirators.
  - 3. Record all air quality readings and maintain records on site.
  - 4. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded.
  - 5. Ensure that the degree and type of respiratory protection provided is protective for the monitored concentrations and individual chemical parameters.
  - 6. Lawfully dispose of all personal protective equipment that cannot be decontaminated.
- G. Work under this contract is being performed on a “Regulated clean-up site”, as defined in 29 CFR §1910.120, 29 CFR §1926.65, and Article 1.4 F, above.
- H. The site-specific HASP must include all elements required by OSHA’s HAZWOPER standard, as contained in 29 CFR §1910.120(b) and 29 CFR §1926.65(b) and the elements in this specification.
- I. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR §1910.120(e) and 29 CFR §1926.65(e).
- J. Develop and implement a medical surveillance program per 29 CFR §1910.120(f) and 29 CFR §1926.65(f) for applicable employees.
- K. Provide a Lead Exposure Control Plan in accordance with 29 CFR §1926.62(e)(2).

#### 1.7 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The HASP shall comply with the requirements of 29 CFR §1910.120(b)(4) and 29 CFR §1926.65(b)(4).
- B. The following items shall be included/addressed in the HASP:
  - 1. A safety and health risk or hazard analysis for each site task and operation in the workplan;
    - a. A physical hazard evaluation and hazard control plan shall be included covering, but not limited to the following, as applicable:
      - 1) Equipment operation;
      - 2) Confined space entry;
      - 3) Slips, trips, and falls;



- 4) Building collapse;
  - 5) Falling debris;
  - 6) Encountering unmarked utilities;
  - 7) Cold and heat stress;
  - 8) Hot work (cutting and welding);
  - 9) Drum and container handling;
  - 10) Trench and/or excavation entry.
2. Employee training assignments to assure compliance with 29 CFR §1910.120(e) and 29 CFR §1926.65(e).
3. Personal protective equipment to be used for each site task and operation in the workplan;
  - a. Inclusive of a personal protective equipment program to comply with 29 CFR §1910.120(g)(5) and 29 CFR §1926.65(g)(5).
4. Medical surveillance requirements to comply with 29 CFR §1910.120(f) and 29 CFR §1926.65(f).
5. The frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment to be used.
  - a. The action level (AL) and Permissible Exposure Limit (PEL) for each contaminant must be listed along with the type of monitoring instrument that will be used.
  - b. The frequency of the monitoring must also be included (i.e. continuous, daily, weekly, monthly).
6. Site control measures to comply with 29 CFR §1910.120(d) and 29 CFR §1926.65(d).
7. Decontamination procedures to comply with 29 CFR §1910.120(k) and 29 CFR §1926.65(k).
8. An emergency response plan for the safe and effective response to emergencies, including the necessary PPE and other equipment to comply with 29 CFR §1910.120(l) and 29 CFR §1926.65(l);
  - a. Including, but not limited to the following:
    - 1) A map indicating the route to a nearby hospital or medical clinic for emergency medical care;
    - 2) Procedures for emergency medical treatment and first aid;
    - 3) The names of three (3) Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous

chemicals, that the Contractor intends to use in the event of an emergency;

- 4) Site evacuation routes and procedures;
  - 5) Emergency alerting and response procedures.
9. Confined space entry procedures to comply with 29 CFR §1910.146 and 29 CFR 1926, Subpart AA.
10. A spill containment program to comply with 29 CFR §1910.120(j) and 29 CFR §1926.65(j).

## PART 2 PRODUCTS

### 2.1 AIR MONITORING EQUIPMENT

- A. If organic vapors or total hydrocarbons are known, likely, or suspected to be encountered during the work:
  - 1. Provide and maintain a portable photo-ionization detector (PID) or flame-ionization detector (FID) capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 parts per million (PPM) level.
- B. If hazardous atmospheres (oxygen, hydrogen sulfide, carbon monoxide, methane, etc.) are known, likely, or suspected to be encountered during the work:
  - 1. Provide and maintain an applicable multi-gas analyzer to measure concentrations in applicable work environments (i.e. confined spaces, trenches, tunnels, buildings, etc.).
- C. If there is a potential for the accumulation of explosive gas:
  - 1. Provide and maintain an explosimeter (LEL meter).
- D. If there is a potential for visible dust emissions or the site, dust monitoring must be considered.
  - 1. The Contractor is responsible for monitoring fugitive dust emissions in accordance with applicable local, state, and federal regulations.
  - 2. Equipment shall be sensitive to particulate matter less than 10 micrometer in size (PM<sub>10</sub>) at a level of 100 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).
  - 3. Contractor shall outline the dust monitoring program in their HASP, including applicable action levels.
- E. All air monitoring equipment shall remain the property of the Contractor.
- F. All air monitoring equipment readings must be recorded and be available for federal, state, and/or local regulatory personnel to review.

### 2.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. All PPE must conform to the OSHA requirements, as indicated in the previous Reference Standards Section. Various PPE to be furnished by the Contractor under

different levels of protection for their own personnel and subcontractor's personnel include, but are not limited to, the following:

1. Level D Protection:
  - a. Coveralls or Tyvek
  - b. Gloves
  - c. Safety boots/shoes
  - d. Safety glasses
  - e. Hearing protection (for high noise operations)
  - f. Hard hat with optional face shield
2. Level C Protection:
  - a. Air-purifying respirator
  - b. Chemical protective overalls or Coveralls (e.g., Saran coated Tyvek)
  - c. Gloves, inner (disposable, surgical type)
  - d. Gloves, outer (Neoprene, Nitrile, Viton or Butyl)
  - e. Boots, chemical protective, steel toe and shank (Neoprene or Nitrile)
  - f. Booties, chemical protective (disposable PVC)
  - g. Hard hat
  - h. Face shield (if necessary)
3. Levels B and A represent increased levels of personal protection and are described in the Reference Standards.
4. Contractor is fully responsible for all PPE selection (including the various stages of protection), proper use, maintenance, and continuous monitoring.

## PART 3 EXECUTION

### 3.1 HEALTH AND SAFETY PLANNING AND IMPLEMENTATION

- A. Implement the HASP throughout the execution of all applicable work.
- B. The Contractor shall perform all monitoring as detailed in the HASP.
- C. Contractor(s) shall implement routine health and safety meetings and any follow-up supplemental briefings.
- D. Provide applicable health and safety training for all personnel who may come in contact with or be exposed to various dangerous, hazardous, or changing site conditions.
- E. Personnel who have not received applicable training and who are not equipped with the required PPE, shall not be permitted access to the site by the Contractor during the course of the work that may result in potential exposures to unsafe or hazardous site conditions.



- F. All personnel, including personnel for subcontractors, who must maintain 40-hour OSHA training, shall provide certificates of completion for the applicable 8-hour OSHA refresher course.

### 3.2 DUST CONTROL AND MONITORING

- A. Implement fugitive dust suppression to prevent unacceptable levels of dust resulting from contaminated soil excavation work. Dust suppression methods shall be subject to review by the Engineer. Supervise fugitive dust control measures and monitor airborne particulate matter as required.
- B. See Section 021100 for specific dust control measures.

### 3.3 PERSONNEL AND EQUIPMENT DECONTAMINATION

- A. All equipment shall be provided to the work site free of contamination. Engineer may prohibit from the site any equipment which in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of Contractor's equipment prior to arrival at the site shall be at the expense of Contractor. Contractor is prohibited from decontaminating equipment on the project site which is not thoroughly decontaminated prior to arrival.
- B. Contractor shall furnish labor, materials, tools, and equipment for decontamination of all personnel, equipment and supplies which are used to handle contaminated materials.
- C. Properly store and dispose of contaminated PPE and all other generated decontamination waste.

### 3.4 INCIDENT REPORTING

- A. The Contractor shall comply with all accident and/or incident reporting requirements, including the following:
  - 1. Should any unforeseen safety-related factor, hazard, or condition become evident during the course of the work, the Contractor must immediately take action to establish, maintain, and secure the site and working conditions. This shall be followed by immediate notice to the Owner and Engineer.
  - 2. If injury to any person on-site occurs, the Contractor shall immediately report the incident to the Owner and Engineer. Corrective actions shall be implemented.

END OF SECTION

SECTION 02 61 00

EXCAVATION AND HANDLING OF CONTAMINATED SOIL

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Excavation, handling, and direct loading of Contaminated Soil and other Contaminated Materials.
  - a. Refer to the “Soil Excavation Plan” (R-101) for the location of known areas of contaminated soils to be excavated.
2. Decontamination of tools, equipment, and vehicles and the collection, management and disposal of resulting liquids and/or solids.
3. Other work involving the handling of contaminated materials which may be required, including but not limited to, miscellaneous facility component removal, removal of obstructions, excavation support systems, and any incidental work related thereto.
4. Bulk non-friable asbestos-containing debris (e.g. cement panel/pipe “transite”) was identified in the soil at the site along with elevated levels of lead and limited semi-volatile organic compounds (SVOCs). See the “Exceedance Summary” (R-100) and “Soil Excavation Plan” (R-101) for contaminated soil sampling and extents.
5. The contaminated soil shall be excavated to the limits and depths shown on the “Soil Excavation Plan” (R-101), and disposed at a properly permitted facility.

B. Related Documents

1. Section 01 35 00– Health and Safety Plan
2. Section 02 81 00 – Transportation and Disposal of Contaminated Materials
3. Section 31 00 00 – Backfill, Compaction, and Dewatering
4. Section 32 90 03 – Lawns and Grasses

C. Related Information:

1. Table 1 – Summary of Analytical Data
2. R-100 – Exceedance Summary
3. R-101 – Soil Excavation Plan

1.2 REFERENCES

- A. United States Environmental Protection Agency (EPA) National Emissions for Hazardous Air Pollutants (NESHAP) Regulations (Title 40 CFR, Part 61, Subpart M)

- B. Occupational Safety and Health Administration (OSHA) Asbestos Regulations (Title 29 CFR, Part 1926.1101)
- C. Connecticut Department of Energy and Environmental Protection (CTDEEP) Regulations (Section 22a 209 8 (I) and Section 22a 220 of the Connecticut General Statutes)
- D. Connecticut Department of Public Health (CTDPH) Licensure Regulations (Section 20-440-1 of the Connecticut General Statutes)
- E. Regulations of Connecticut State Agencies (R.C.S.A) Sections 22a-133k-1 through 22a-133k-3, the Remediation Standard Regulations (RSRs)
- F. 40 CFR Part 261, Identification and Listing of Hazardous Waste
- G. 40 CFR Part 268, Land Disposal Restrictions

### 1.3 DEFINITIONS

- A. Air Monitoring - The process of measuring the total airborne fiber concentration of an area or exposure of a person.
- B. Asbestos - The name given to a number of naturally occurring fibrous silicates. This includes the serpentine forms and the amphiboles and includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, or any of these forms, which have been chemically altered.
- C. Asbestos Fibers - Those particles with a length greater than five (5) microns ( $\mu$ ) and a length to diameter ratio of 3:1 or greater.
- D. Asbestos Work Area - A regulated area as defined by OSHA Title 29 CFR, Part 1926.1101 where asbestos abatement operations are performed that is isolated by physical barriers to prevent the spread of asbestos dust, fibers, or debris. The regulated area shall comply with requirements of regulated area for demarcation, access, respirators, prohibited activities, competent persons and exposure assessments and monitoring.
- E. Category I Non-Friable Material – Asbestos-containing packings, gaskets, resilient floor coverings, and asphalt roofing products.
- F. Category II Non-Friable Material – All other non-friable asbestos-containing materials (e.g. cement piping/panels)..
- G. Clean Room - An uncontaminated area or room, which is a part of the worker decontamination system with provisions for storage of workers' street clothes and protective equipment.
- H. Clean Fill: Means (1) natural soil, (2) rock, and (3) uncontaminated concrete.
- I. Competent Person - As defined by OSHA Title 29 CFR, Part 1926.1101, a representative of the Abatement Contractor who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure. Person who has authority to take prompt corrective measures to



eliminate such hazards during asbestos removal. Competent person shall be properly trained in accordance with EPA Model Accreditation Plan (MAP).

- J. Contaminated Soil: Means soils or fills affected by a known or suspected release and determined, or reasonably expected, to contain substances exceeding RES DEC or GB PMC, as these terms are defined in section 22a-133k-1 of the R.C.S.A.
- K. Decontamination System – A series of connected areas, with curtained doorways between any two adjacent areas, for worker and equipment decontamination. A decontamination system always contains at least one airlock and is adjacent and connected to the regulated area, where possible.
- L. Engineer -The third- party Engineering/Environmental Engineer for the project.
- M. Equipment Room - Any contaminated area or a room that is part of the worker decontamination system with provisions for storage of contaminated clothing and equipment.
- N. Natural Soil: Soil in which all substances naturally occurring therein are present in concentrations not exceeding the concentrations of such substance occurring naturally in the environment and in which soil no other substance is analytically detectable.
- O. NESHAP - National Emissions Standard for Hazardous Air Pollutants regulations enforced by the EPA.
- P. Permissible Exposure Limit (PEL) - The maximum total airborne fiber concentration to which an employee is allowed to be exposed. The limit established by OSHA Title 29 CFR, Part 1926.1101 is 0.1 fibers/cc as an 8-hour TWA and 1.0 fibers/cc averaged over a sampling period of 30 minutes as an Excursion Limit. The Contractor shall be responsible for maintaining work areas in a manner that this standard is not exceeded.
- Q. Project Monitor - A professional capable of conducting air monitoring and analysis of schemes. This individual should be an industrial hygienist, an environmental scientist, or an engineer with experience in asbestos air monitoring and worker protection equipment and procedures. This individual should have demonstrated proficiency in conducting air sample collection in accordance with OSHA Title 29 CFR, Parts 1910.1001 and 1926.1101.
- R. Regulated Area - An area established by the employer to demarcate where Class I, II, and III asbestos abatement is conducted, and any adjoining area where debris and waste from such asbestos work accumulate, and a work area within which airborne concentrations of asbestos exceed or there is a reasonable possibility that they may exceed the PEL.
- S. Shower Room - A room between the clean room and the equipment room in the work decontamination system with hot and cold running water and suitably arranged for employee showering during decontamination. The shower room is located in an airlock between the contaminated area and the clean area.
- T. Special Handling: Methods used to excavate, collect, grade, load, move, transport, stockpile, dispose, or otherwise manage a Contaminated Material or Contaminated Soils such that (1) the spillage, loss, comingling, or uncontrolled deposition of such

material is minimized, (2) personal exposure to contaminants present in such a material are minimized, (3) the adverse impacts to the community and the surrounding environment from contaminants present in such material are minimized, and (4) all applicable regulatory requirements applicable to such activity are satisfied.

#### 1.4 CONTROL OVER REMOVAL WORK

- A. All Contractor work procedures shall be monitored by the Contractor's "Competent Person" to ensure that areas outside the designated work locations do not become contaminated. The following controls shall be implemented each working day to help ensure this:
  - 1. Prior to work on any given day, the Contractor's designated "Competent Person" shall evaluate job tasks with respect to safety procedures and requirements specified to prevent contamination of the building or the employees. This includes a visual survey of the work area and the decontamination enclosure systems.
- B. The Contractor shall maintain control of and be responsible for access to all work areas to ensure the following requirements:
  - 1. Nonessential personnel are prohibited from entering the area.
  - 2. All authorized personnel entering the work area shall sign the work area entry log.
  - 3. All authorized personnel entering the work area shall read the "worker protection procedures" which are posted at the entry points to the enclosure system, and shall be equipped with properly fitted respirators and protective clothing.
  - 4. All personnel who are exiting from the decontamination enclosure system shall be properly decontaminated.

#### 1.5 SITE SECURITY

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

#### 1.6 PERSONNEL PROTECTION

- A. Prior to commencing work, instruct all workers in all aspects of personnel protection, work procedures, emergency procedures use of equipment including procedures unique to this project.
- B. Respiratory protection shall meet the requirements of OSHA as required in Title 29 CFR Parts 1910.134, 1926.11, and 1926.62.
- C. A formal respiratory protection program must be implemented in accordance with Title 29 CFR, Part 1926.1101 and Title 29 CFR, Part 1910.134.

- D. The Contractor shall conduct exposure assessment air sampling, analysis and reporting to ensure the workers are using appropriate respiratory protection.
- E. The Contractor shall provide appropriate respiratory protection for each worker and ensure usage during potential asbestos exposure.
- F. The Contractor shall provide respirators from among those approved as being acceptable for protection by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of Title 30 CFR, Part II.
- G. The Contractor shall provide an adequate supply of filter for respirators in use.
- H. Minimum respiratory protection shall be as follows:

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

Note:

1. Respirators assigned for higher airborne fiber concentrations may be used at lower concentrations.
2. A high efficiency filter means a filter that is at least 99.97 percent efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.
3. In addition to the selection criteria in this Section, the Contractor shall provide a tight-fitting powered air purifying respirator equipped with high efficiency filters or a full facepiece supplied air respirator operated in the pressure demand mode equipped with HEPA egress cartridges or an auxiliary positive pressure self- contained breathing apparatus for all employees within the regulated area where Class I work is being performed for which a negative exposure assessment has not been produced and the exposure assessment indicates the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full facepiece supplied air respirator operated in the pressure

demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

- I. The Contractor shall provide and require all workers to wear protective clothing in Work Areas where asbestos fiber concentration exceed permissible limits established by the OSHA or where contamination exists. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.
- J. The Contractor shall ensure that all authorized persons entering contaminated areas are equipped with proper respirators and protective clothing.

#### 1.7 WORKER PROTECTION PROCEDURES

- A. The Contractor shall monitor airborne asbestos concentrations in the workers' breathing zone to establish conditions and work procedures for maintaining compliance with OSHA Regulations Title 29 CFR Parts, 1910.1001 and Part 1926.1101.
- B. The Contractor's air sampling professional shall document all air sampling results and provide all air sampling reports as soon as feasible. OSHA air monitoring results shall be posted at a conspicuous location at the job site.
- C. All personnel air sampling shall be conducted in accordance with methods described in OSHA standards Title 29 CFR Parts 1910.1001 and Pat 1926.1101.
- D. The Contractor is responsible for complying with all additional OSHA regulations while performing work on this project.

#### 1.8 WORKER QUALIFICATIONS, TRAINING, AND EDUCATION

- A. Contractor is required to have a minimum CT-Licensed Supervisor on-site at all times work is in progress.
- B. Contractor is required to have an accredited asbestos Supervisor in each work area at all times work is in progress. Supervisor shall be fluent in English.
- C. The Supervisor shall be thoroughly familiar and experienced with asbestos abatement and related work, and shall enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of EPA, OSHA, and NIOSH requirements and guidelines.
- D. Enforce strict discipline and good working order at all times among employees, and do not employ any person not skilled in the work assigned, nor anyone who has not received documented notice of the hazards of asbestos abatement, formal training in the use of respirators, safety procedures, equipment, clothing, and work procedures. All workers shall be licensed in accordance with applicable state regulations.

#### 1.9 SUBMITTALS

- A. The Contractor will submit the following submittals to the Engineer ten calendar days prior to the commencement of removal work:

1. Submit copies of all notifications, permits, applications, licenses and like documents required by federal, state, or local regulations obtained or submitted in proper fashion.
  2. Submit the current valid State of Connecticut Asbestos Abatement Contractor license and certificate of insurance.
  3. Submit the name and address of the hauling contractor and landfill to be used. Also submit current valid operating permits and certificates of insurance for the transporter and landfill.
  4. Submit the plans and construction details for the construction of the decontamination systems and the isolation of the work areas as may be necessary for compliance with this specification and applicable regulations.
  5. Submit the training, medical, respirator fit test records, and CTDPH license of each employee who may be on the Site.
  6. If the Contractor's CTDPH-licensed Asbestos Abatement Supervisor is not conducting OSHA-required employee exposure monitoring, submit the qualifications of the air sampling professional that the Contractor proposes to use for this project for this task.
  7. Submit detailed product information on all materials and equipment proposed for asbestos abatement work on this project.
  8. Submit pertinent information regarding the qualifications of the Project Supervisor (competent person) for this project, as well as a list of past projects completed.
  9. Submit a chain-of-command for the project.
  10. Submit a site-specific Emergency Action Plan for the project. The Emergency Action Plan may include emergency procedures to be followed by Contractor personnel to evacuate the building, hospital name and phone number, most direct transportation route from the Site, emergency telephone numbers, etc. If this information is contained within an Emergency Action Plan prepared by the Site's General Contractor, a copy shall be submitted for review.
  11. Submit a written site-specific Respiratory Protection Program for employees for the Work, including make, model and National Institute of Occupational Safety and Health (NIOSH) approval numbers of respirators to be used at the Site (if applicable).
  12. Submit the proposed worker orientation plan that, at a minimum, includes a description of asbestos hazards and abatement methodologies, a review of worker protection requirements, and the outline of safety procedures.
- B. The Contractor will submit the following to the Engineer during the course of the work:
1. Daily results of all personal air sampling.



2. Certificate, training, medical, and fit-test records for new employees to start work (24 hours in advance of work).
  3. Contractor site logs.
  4. Copies of Waste Shipment Records for waste that leaves the site.
- C. The following shall be submitted to the Engineer within forty-five days of the completion of work:
1. Completed copies of Waste Shipment Records (WSR).
  2. Remaining Personal Air Sampling Results and Site Logs.

#### 1.10 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and other State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- B. All Contaminated Soils and Contaminated Materials excavated or otherwise collected, consolidated and managed during the course of the work will require Special Handling in accordance with these specifications, Contractor Health and Safety Plan, and all applicable permits, approvals, authorizations, and regulations.
- C. Perform the handling of Contaminated Soils and Contaminated Materials with equipment and techniques in accordance with the performance requirements defined in this specification.

#### 1.11 PRECONSTRUCTION MEETING

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

### PART 2 PRODUCTS – NOT USED

### PART 3 EXECUTION

#### 3.1 GENERAL

- A. Provide all employees and subcontractor(s) with personal protective equipment and protective clothing consistent with the levels of protection for this work as indicated in Contractor's Health and Safety Plan.
- B. The contractor, including supervisor, workers, and operators shall have valid CTDPH asbestos licensure. Workers and operators shall don proper PPE until a negative exposure assessment (NEA) indicates a reduction per OSHA 29 CFR 1926.1101.
- C. Perform all Contaminated Soils and Contaminated Material handling operations in accordance with standard engineering practices applicable to such activity, according to CTDEEP regulations, and according to the provisions of Contractor Health and Safety Plan. Utilize methods which consider the health and safety of all Contractor

and subcontractor personnel, support personnel, Engineer and his representatives, and surrounding environment.

- D. All site health and safety controls shall be fully established and in operation prior to beginning any contaminated material handling activity. Site controls shall include but not be limited to work zones properly barricaded, decontamination facilities, air monitoring, and all support equipment and supplies including personal protective equipment. Comply with the requirements of Section 01 35 00, Health and Safety Plan.
- E. Minimize the spread of contaminated materials during handling. Transport vehicles used to move contaminated soil and other contaminated materials at the Project Site shall be free from leaks. Trucks or other conveyances deemed unacceptable for use by Engineer shall not be used.
- F. Keep work areas, including but not limited to, areas adjacent to excavations, roadways leading to and from excavation areas, driveways, parking areas, and public roadways free of contaminated materials. If such materials are deposited, spilled, or spread, such material shall be removed promptly, and properly disposed of to the satisfaction of Engineer no later than the end of each working day or as requested by Engineer.
- G. Owner is the generator and will designate an authorized signatory to sign all manifests and bills of lading (if needed). Except for materials required to be transported under manifest, transport all Contaminated Soils and Contaminated Materials under bills of lading regardless of the chemical quality of the soils and materials.

### 3.2 DECONTAMINATION SYSTEM

- A. The Contractor shall establish on-site, a remote decontamination enclosure consisting of equipment room, shower room, and clean room in series.
- B. Access between rooms in the decontamination system shall be through double flap-curtained openings. The clean room, shower, and equipment rooms within the decontamination enclosure shall be completely sealed.
- C. Construct the decontamination system with plastic, wood, or metal framing and cover both sides with a double layer of 6-mil poly sheeting, sealed with spray glue or tape at the joints.
- D. The Contractor shall visually inspect barriers routinely to assure effective seal, and the Contractor shall repair defects immediately.
- E. The remote decontamination unit shall be operated in compliance with OSHA Asbestos in Construction Regulations (29 CFR 1926.1101 (j) (2)).
- F. Waste water from the decontamination must be filtered in accordance with 19a-332a-5(i) of CTDPH regulations.

### 3.3 EXCAVATION OF CONTAMINATED SOILS AND MATERIALS

- A. Excavate Contaminated Soils and Contaminated Materials to the depths and horizontal limits shown on the Drawings and as indicated by Engineer.
  - 1. Excavation shall be performed with a flat-blade excavator or hand tools.
  - 2. Following excavation, load Contaminated Soils and Contaminated Materials directly into polyethylene sheeting lined trucks and/or dumpsters for immediate disposal, if all applicable conditions of Section 02 81 00 Transportation and Disposal of Contaminated Materials have been met and approved by Engineer.
  - 3. Temporary stockpiling of Contaminated Soils and Contaminated Materials shall not be permitted, and shall only be allowed under unavoidable extenuating circumstances in small quantities.
- B. Engineer will continually evaluate field conditions to determine if additional excavation is required to achieve remedial objectives. This evaluation may require Engineer to work in close proximity to Contractor's excavation equipment, and may require frequent pauses in the work. Contractor shall work in a cooperative manner at all times during these operations to ensure the safety of Engineer, and to allow for thorough field evaluations to be conducted.
  - 1. When contaminated material excavation is undertaken, Engineer will make the final determination as to the limits of excavation required to achieve remediation objectives. Such limits may be greater than or less than the limits identified in R-101 and shall be based upon actual conditions encountered at the time of excavation.
  - 2. If required, Engineer will define those areas beyond the limits originally indicated where additional contaminated material excavation shall be required based upon field observations.
- C. Minimize the spread and loss of contaminated materials during excavation activities.
- D. Employ methods necessary to isolate Contaminated Soils and Contaminated Materials from non-contaminated soils to the degree practicable.
- E. Segregate construction debris from excavated contaminated materials at the point of excavation, prior to the movement of contaminated materials from excavation areas. Engineer may evaluate debris during excavation to determine if such material can be designated uncontaminated general demolition material.
- F. Open excavations represent a substantial hazard. Contractor shall implement measures as appropriate to secure open excavations while awaiting Engineer's confirmation test results from soils or any other period when excavations remain open.
- G. Implement measures to divert surface water around excavation sites to prevent water from directly entering open excavations.

### 3.4 DUST CONTROL

- A. Control dust and manage wind erosion during the Work. Prevent dust from becoming airborne and potentially affecting adjoining properties. Dust control during the project is a matter of special concern to the Owner. Stringent control of dust generation is required. Dust control measures may include (but are not limited to):
  - 1. Misting during soil excavation.
  - 2. Sprinkling or misting exposed surfaces with water.
  - 3. Uniformly applying calcium chloride on exposed soil and haul roads.
  - 4. Sweeping paved areas daily.
- B. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- C. Cease work if conditions allow visible dust to migrate off-site, or when directed by the Engineer. Resume work only when corrective measures have been implemented.
- D. Use a mechanical (wet) street sweeper, as necessary.
- E. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.
- F. Control dust during the work on-site using calcium chloride and/or water.
- G. During the Work on-site, all paved road and driveway surfaces shall be scraped and broomed free of excavated materials on a daily basis. The surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed. Soil and debris must be handled as Asbestos and Lead-contaminated and must be disposed as Mixed Asbestos/Lead Waste.
- H. Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of demolition, excavation or surface preparation for coatings.
- I. Control dust by the construction of temporary wooden frame/polyethylene sheeting walls and covering enclosures separating adjacent or nearby areas and equipment from the Work site.
- J. Submit for approval materials proposed for use for dust control, prior to start of the Work.
- K. Appropriate measures to ensure adequate dust control measures are taken during freezing conditions. Contractor shall use non-toxic, environmentally friendly methods to prevent water used for dust control from freezing when temperatures are at or below 32 degrees.
- L. Engineer will provide dust control monitoring. Monitoring will consist of:
  - 1. Particulate concentrations will be monitored continuously at the downwind perimeter of the site at temporary particulate monitoring stations. The

particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. In addition, fugitive dust migration should be visually assessed during all work activities.

2. If the downwind PM10 particulate level is 5 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques including water spray, calcium chloride spray, stockpile covering, surface sweeping, etc. must be employed. If, after implementation of dust suppression techniques, downwind PM10 particulate levels are greater than  $5 \text{ mg}/\text{m}^3$ , work must be stopped and a re-evaluation of activities initiated.
- M. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
1. All removed materials that are salvageable are the property of the Contractor unless otherwise noted in the specifications.
  2. All debris resulting from the performance of this contract will be the property of the Contractor and will be completely removed from the campus and disposed of in a legal manner.
- N. Dumpsters will be completely covered with a waterproof covering at all times when not in use. Remove from the site daily of all dumpsters that are full or over flowing.

### 3.5 BACKFILL

- A. Backfill excavations in accordance with Section 31 11 00, Excavation, Backfill, Compaction, and Dewatering.
- B. Backfill excavations as soon as possible after Engineer has indicated that test results confirm remediation objectives have been achieved and backfilling may proceed.

### 3.6 UNFORESEEN CONTAMINATED MATERIALS

- A. In the event that unforeseen contaminated materials are encountered during the course of the work, permit the Engineer sufficient time to devise an appropriate course of action based upon the conditions present.
  1. Until such appropriate course of action is devised, Contractor shall secure the work area in question such that it does not pose a health and safety risk.
  2. Engineer will provide Contractor with a scope of work and performance requirements for the collection, consolidation, removal, or excavation of unforeseen contaminated material. Contractor shall then undertake contaminated material remediation with equipment and techniques established



by Contractor in accordance with said scope of work and performance requirements.

- B. Contaminated material remediation shall be performed in accordance with the scope of work outlined in the Soil Excavation Plan (R-101) and in accordance with this specification.

### 3.7 TESTING BY ENGINEER

- A. The Engineer shall collect and analyze background Phase Contrast Microscopy (PCM) air samples to ascertain the integrity of controls, which protect from asbestos contamination. Independently, the contractor shall monitor air quality within the work area to ascertain the protection of employees and to comply with OSHA regulations.
- B. The Consultant shall collect and analyze air samples during the abatement period
  - 1. Abatement Period: The Asbestos Project Monitor shall collect samples on a daily basis during the work period. A sufficient number of background samples shall be taken outside of the work area, to evaluate the degree of cleanliness or contamination of the building during asbestos removal.
    - a. The Asbestos Abatement Project Monitor shall provide a continual evaluation of the air quality at the perimeter of the asbestos regulated work area, using his/her best professional judgments in respect to the State Department of Public Health guideline of 0.010 f/cc.
    - b. If the Asbestos Project Monitor determines that the building air quality has become contaminated from the project, he/she shall immediately inform the contractor to cease all removal operations and implement a work stoppage clean up procedure. The contractor shall conduct a thorough cleanup of areas designated by the Asbestos Abatement Project Monitor.
  - 2. Elevated fiber counts: If elevated fiber counts exceeding the establish pre-abatement level or 0.010 f/cc are recorded, the cause for such elevated readings shall be investigated. If necessary, the contractor shall be responsible for cleaning the affected area and will provide additional support to lower the air born fiber levels.
- C. After review of the Post-Excavation Horizontal Limit and Elevation Surveys and at such time the Engineer is satisfied that the limits of Contaminated Soils have been reached, Engineer will perform appropriate confirmation sampling to confirm remediation objectives have been achieved and no additional contaminated material excavation or removal is required.
- D. Contractor is hereby notified that laboratory turnaround time for the analysis of confirmation samples may be up to 7 working days from date of collection. No claim for delay will be considered based upon Contractor failing to accommodate the laboratory turnaround time as defined herein.

- E. Engineer will inform Contractor if test results confirm remediation objectives have been achieved and backfilling may proceed.
- F. Should the results of Engineer's testing indicate additional Contaminated Soil excavation or removal is required, Engineer will define those areas beyond the limits originally indicated where additional Contaminated Soils excavation or removal shall be required.

### 3.8 STORAGE OF EXCAVATED MATERIALS

- A. All excavated Contaminated Soils and Contaminated Materials shall be loaded directly into trucks or dumpsters at the point of excavation for immediate transport to the disposal facility.
- B. Temporary stockpiling of Contaminated Soils and Contaminated Materials shall not be permitted, and shall only be allowed under unavoidable extenuating circumstances in small quantities.
- C. If temporary stockpiling of excavated Contaminated Soils and Contaminated Materials is necessary due to unavoidable circumstances, such contaminated materials shall be temporarily staged and stockpiled on-site in an area designated by the Engineer in such a manner to protect existing site surface, materials and structures from contamination, runoff and erosion.
- D. Place the Contaminated Soil and Contaminated Materials on a minimum of 6 mil polyethylene sheeting and at the end of each day the stockpiled soil shall be covered with 6 mil polyethylene sheeting and secure the covering to prevent the stockpile from becoming uncovered due to winds.
- E. Alternatively, Contaminated Soils and Contaminated Materials may be excavated and loaded into steel, water tight roll-off containers. Polyethylene liners shall be installed within the roll-off containers prior to loading with soil. Roll-off containers shall be covered with a water tight cover, which shall also be capable of preventing unauthorized access to the roll-off contents. Stage the full roll-off containers in an area designated by the Engineer.

### 3.9 DISPOSAL OF ASBESTOS-CONTAINING AND ASBESTOS-CONTAMINATED WASTE

- A. See Section 02 81 00 for disposal requirements for asbestos waste.

END OF SECTION



SECTION 02 81 00

TRANSPORTATION AND DISPOSAL OF CONTAMINATED SOIL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
  - 1. Transportation and disposal of Contaminated Soil or materials collected, consolidated, excavated, and generated during performance of the Work.
  - 2. Coordination, loading, transportation, and disposal of contaminated materials.
- B. Related Sections
  - 1. Section 01 35 00, Health & Safety Plan
  - 2. Section 02 61 00, Excavation and Handling of Contaminated Soil

1.2 DEFINITIONS

- A. Disposal: The discharge, deposit, injection, dumping, spilling, leaking, incineration or placing of any contaminated material or otherwise hazardous substance into or on any land or water so that such hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.
- B. Generator: Any person, by site, whose act or process produces hazardous waste, or whose act first causes an oil or hazardous material to become subject to regulation.
- C. Regulated Waste: Non-Resource Conservation and Recovery Act (RCRA) hazardous wastes such as oils, petroleum products or residuals, chemical liquids, chemical gases or vapors, non-Toxic Substances Control Act (TSCA) polychlorinated biphenyls (PCBs), waste chemical solids, including soils, and other contaminated material wastes not defined as RCRA Hazardous, TSCA-regulated, or Special Waste.
- D. Manifest: An approved form used as a shipping document to identify the quantity, composition, and the origin, routing, and destination of regulated or hazardous waste from the site of generation to the point of disposal, treatment, storage, or use.
- E. Shipping Paper: An invoice, bill of lading, or other shipping document serving a similar purpose; other than a hazardous waste manifest used to document the conveyance of materials between different locations, including regulated wastes when applicable.
- F. Treatment: Any method, technique or process, including neutralization, incineration, stabilization or solidification, designed to change the physical, chemical or biological character or composition of any hazardous waste so as to neutralize such waste or so as to render such waste less hazardous, non-hazardous, safer to transport, amenable to storage, or reduced in volume, except such method or technique as may be included as an integral part of a manufacturing process at the point of generation.
- G. TSCA/RCRA Landfill: This type of landfill is permitted to accept material that contains PCBs  $\geq 50$  ppm, acceptable for landfill disposal as defined in Title 40 CFR Part 761; material that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in Title 40 CFR Part 261 but meets the treatment standards established in Title 40 CFR Part 268 Land Disposal Restrictions; and all other material classified as a hazardous waste in Connecticut General Statutes (CGS) Section 22a-114 to 22a-134z Hazardous Waste Regulations. This type of landfill shall be approved to operate under a Federal Part B operating permit and shall be permitted to accept material with PCB concentrations  $\geq 50$  ppm under TSCA. The landfill shall be designed

with a double composite liner meeting minimum RCRA design requirements. The landfill shall operate a leachate collection system and shall also operate a leak detection well system. The landfill shall be capable of stabilizing materials for meeting requirements of the USEPA's present rules required under the 1984 amendments to RCRA, banning the land disposal of hazardous material.

- H. RCRA Landfill: This type of landfill is permitted to accept soil that contains PCBs levels below 50 ppm; soil that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261 but meets the treatment standards established in 40 CFR Part 268 Land Disposal Restrictions. This type of landfill shall be approved to operate under a Federal Part B operating permit. The landfill shall be designed with a double composite liner meeting minimum RCRA design requirements. The landfill will operate a leachate collection system and will also operate a leak detection well system. The landfill shall be capable of stabilizing soils for meeting requirements of the land ban.
- I. Non RCRA Out of State Lined Landfill: This type of landfill shall be state approved or permitted to accept soil that is defined as a hazardous material in Connecticut General Statutes (CGS) Section 22a-114 to 22a-134z Hazardous Waste Regulations, but is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261; soil containing PCBs below 50 ppm; and all other soil not permitted or unsuitable for in state disposal or recycling.

### 1.3 SUBMITTALS

- A. Submit all pertinent information relating to the transport and disposal of materials specified herein, within 14 days after issuance of the Notice to Proceed and prior to transport and disposal. The information submitted be in one package and shall include the following, as a minimum:
  - 1. Information for proposed treatment/disposal facility or facilities including the following:
    - a. General Information
      - 1) Facility Name
      - 2) Facility Address
      - 3) Name of Contact Person
      - 4) Title of Contact Person
      - 5) Telephone Number of Contact Person
      - 6) Permit Number
    - b. The facility shall specify the volume of material that can be accepted from the Project on a weekly and a total basis.
    - c. The facility shall provide written confirmation that they are permitted to accept and will accept the classified contaminated materials the general quality and quantity described by these specifications.
    - d. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and treatment/disposal of the contaminated materials described by these specifications.
  - 2. Connecticut Department of Transportation Transporter Identification Number and expiration date.
  - 3. Name and address of all hazardous material transporters to be used to transport materials including proof of permit, license, or authorization to transport hazardous material in all affected states.
- B. Upon receipt of final approval from treatment/disposal facility to accept contaminated materials, submit copy of said approval.



- C. Within ten (10) working days after the off-site transportation of contaminated materials, submit copies of all paperwork related to transportation of contaminated materials. Such paperwork may include, but not be limited to receipts, weight tickets, and disposal certificates.
  - 1. Provide certified tare and gross weight slips for each load received at the designated treatment/disposal facility which shall be attached to copy of related manifest or bill of lading.
- D. Prior to receiving progress payment, submit documentation certifying that all materials were transported to, accepted, and disposed of, at the selected treatment/disposal facility. The documentation shall include the following, as a minimum.
  - 1. Documentation for each load from the site to the disposal facility, including all manifests and any other applicable transfer documentation.
  - 2. All documentation for each load shall be tracked by the original manifest or bill of lading document number assigned at the project site at time of signature by authorized Engineer.

#### 1.4 REGULATORY REQUIREMENTS

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

### PART 2 PRODUCTS – NOT USED

### PART 3 EXECUTION

#### 3.1 GENERAL

- A. Sample, test, or analyze contaminated material for approval of final disposal. Engineer will sample and analyze contaminated soil.
- B. Contaminated materials to be disposed of include, but are not limited to contaminated soil, rock, miscellaneous contaminated debris, petroleum fuels, petroleum residuals, concrete, and other materials from remediation, demolition and decontamination operations.
- C. All contaminated materials excavated, consolidated, or otherwise managed during the course of the work will require special handling in accordance with these specifications, the Contractor's Health and Safety Plan, and all applicable permits, approvals, authorizations, and regulations.
- D. Dispose of contaminated materials at facilities approved by Owner or Engineer.
- E. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Site Health and Safety Plan.
- F. Contractor shall select treatment/disposal facilities to receive contaminated materials from the Project which are established, fully operational, and in full compliance with all applicable Federal, State, and local regulations.
- G. Perform collection of characterization (except soils) samples and laboratory analyses to satisfy the acceptance criteria for selected receiving facility(s).
- H. Remove all contaminated materials from the project site and legally dispose of materials.

#### 3.2 CHARACTERIZATION FOR DISPOSAL-CONTAMINATED SOIL

- A. Contaminated soil characterization sampling will be conducted by the Engineer.
- B. The Engineer will collect soil samples. Such samples may be collected from within Excavation Areas, or following deposition of Contaminated Soil in the Temporary Controlled Stockpile Area.

### 3.3 DISPOSAL COORDINATION AND TRANSPORT

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

### 3.4 MANIFESTS AND SHIPPING PAPERS

- A. Owner is designated as the "Generator" and will sign all Manifests and Shipping Papers. Manifests and Shipping Papers shall be prepared by Contractor twenty four (24) hours in advance of shipment of contaminated materials. Authorized Owner's representative will sign as "Generator" as each load of contaminated material leaves the Project Site. Contractor shall forward appropriate original copies of Manifests or Bills of Lading to Engineer on the same day the contaminated materials leave the Project Site.

### 3.5 TRANSPORT OF CONTAMINATED MATERIAL

- A. Transport contaminated materials off site after all treatment/disposal facility documentation has been completed and the material accepted by said facility.
- B. Transport contaminated materials from the site to treatment/disposal facility in accordance with all United States Department of Transportation (DOT), USEPA, Connecticut regulations and other regulations of all affected states.
- C. The Hauler(s) shall be licensed in all states affected by transport.
- D. Provide to Engineer copies of all weight slips, both tare and gross, for every load weighed and disposed of at the accepted disposal facility. The slips shall be tracked by the original manifest document number that was assigned by Engineer at the site. Owner will only make progress payments upon receipt of these weight slips.
- E. Minimize the potential for development of free liquid during transport. Do not load wet soils for transport. If free liquid does develop during transport, Contractor shall be responsible for proper collection and disposal of same.
- F. Soil located in the Temporary Stockpile Area shall be removed from the Project Site in accordance with the requirements of this section.

### 3.6 DISPOSAL OF ASBESTOS-CONTAINING AND ASBESTOS-CONTAMINATED WASTE

- A. All asbestos-containing and or asbestos-contaminated material disposal must be in compliance with requirements of the CTDEEP, CTDPH, and the EPA NESHAP regulations.
- B. All asbestos-containing waste material transported off the facility site shall have a waste shipment record that includes the following information:
  - 1. The Owner's name, address, and telephone number.
  - 2. The name of the Disposal Site Operator, address, and telephone number
  - 3. The name of the Disposal Site, address, telephone number, date transported, and certification of the Disposal Site for accepting asbestos containing waste
  - 4. The name of the Waste Transporter(s), address, and telephone number. Certification provided to the Owner or Engineer that the contents of the waste are accurately described by proper shipping name, accurate classification, packaged, labelled/marked, and are in good condition for transport.
  - 5. The approximate quantity of asbestos waste in cubic yards, friable or non-friable asbestos, type of packaging utilized for disposal.

- C. Disposal approvals shall be obtained from the CTDEEP before commencing asbestos removal if waste will be disposed of in Connecticut.
- D. Waste container storage locations shall be pre-approved by the Owner and Engineer.
- E. A copy of approved disposal authorization shall be provided to the Owner and Engineer and any required federal, state or local agencies.
- F. Copies of all landfill receipts will be retained by the Engineer as part of the project file. The receipts will be signed by the landfill operator on receipt, and the quantity of asbestos debris leaving the job site and arriving at the landfill acknowledged.
- G. All asbestos debris shall be transported in covered, sealed vans, boxes or dumpsters, which are physically isolated from the driver by an airtight barrier. All vehicles must be properly licensed to meet United States Department of Transportation (USDOT) requirements.
- H. Liquid wastes solely associated with asbestos-containing materials shall be solidified. Liquids associated with PCB removal shall not be solidified and shall be disposed of PCB Remediation waste in leak-tight containers. At no time will liquid wastes be permitted to be stored on site.
- I. Completed Waste Shipment Records (WSR) signed by the landfill must be returned to the Owner or Engineer no later than 45 days from the time the waste was transported off-site. Completed waste shipment records that are not received by the Owner within 35 days shall require the Contractor to begin tracking the waste. The Contractor must notify the Owner of intentions on tracking the waste.
- J. The Contractor must take appropriate actions as outlined in Title 40 CFR Part 61 NESHAP regulations when completed WSR are not forwarded to the Owner or Engineer within 45 days from the time the waste was transported off-site.

END OF SECTION

SECTION 31 00 00

BACKFILL, COMPACTION AND DEWATERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Backfill and compaction following contaminated soil excavation
2. Removal, handling, and disposal of rock
3. Earth retention systems
4. Excavation, backfill and compaction for the abandonment of existing pipe and structures
5. Temporary dewatering systems

B. Related Sections

1. Section 02 61 00, Excavation and Handling of Contaminated Soil
2. Section 32 90 03, Lawns and Grasses

1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
- B. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- C. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- E. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F

1.3 DEFINITIONS

- A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- H. Temporary Dewatering System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

#### 1.4 SUBMITTALS

- A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.
  - 1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.
- B. Performance data for the compaction equipment to be utilized.
- C. Construction methods that will be utilized for the removal of rock.
- D. Dewatering plan for the excavation locations.

#### 1.5 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart



P), and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

- B. The following test procedures will be performed by the Owner's inspection agency. Results will be submitted to the Engineer for review.
  - 1. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:
    - a. For suitable soil materials removed during excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.
    - b. For borrow materials; perform tests at frequency specified in Section 31 23 23 - Borrow Materials.
  - 2. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled. The Engineer will determine the locations and lifts to be tested.
    - a. The Engineer may specify additional compaction testing when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
    - b. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than 95% of maximum dry density at optimum moisture content, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.
    - c. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where excavation sidewalls impact the attenuation of the gamma radiation or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.
- C. Employ the services of a dewatering specialist or firm when well points, deep wells, recharge systems, or equal systems are required. Specialist shall have completed at least 5 successful dewatering projects of equal size and complexity and with equal systems.

## 1.6 PROJECT CONDITIONS

- A. Notify Call Before You Dig (CBYD) at 1-800-922-4455 or 811 and obtain CBYD identification numbers.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

- C. Make explorations and Excavations to determine the location of existing underground structures, pipes, house connection services, and other underground facilities in accordance with Paragraph 3.2.D of this Section.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

- A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.
- B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP.
- C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2 inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.
- D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.
- E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.
- F. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or top soil to be placed on site during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and that metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserves the right to collect and analyze samples from any proposed fill material prior to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained

3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

## 2.2 DEWATERING MATERIALS

- A. Provide haybales and silt fence in accordance with Section 31 25 00.
- B. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Public Safety and Convenience
  1. Take precautions for preventing injuries to persons or damage to property in or about the Work.
  2. Provide safe access for the Owner's and Engineer's representatives at site during construction.
  3. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

### 3.2 CONSTRUCTION

- A. Earth Retention Systems
  1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.
  2. Maintain Earth Retention Systems for the duration of the Work.
  3. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.
  4. Drive sheeting ahead of and below the advancing trench excavation to avoid loss of materials from below and from in front of the sheeting.
  5. Sheet piling is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.
  6. Remove sheeting, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.
  7. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

BACKFILL, COMPACTON, AND DEWATERING

B. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section, at no additional cost to the Owner.
2. Excavate with equipment selected to minimize damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.
3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.
4. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.
  - a. Excavated material not required or not suitable for backfill shall be removed from the site.
  - b. Perform grading to prevent surface water from flowing into the excavation.
  - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the trench nor the Work itself. Avoid obstructing sidewalks and driveways.
  - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
5. Make pipe trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipe.
6. The final 6 inches of excavation and grading of the trench bottom shall be performed by hand so as not to disturb the material below the grade required for setting the pipe or appurtenances.
  - a. Where suitable bedding materials will be placed and compacted throughout the length of the trench, hand excavation of the final 6 inches will not be required.
  - b. Grade the trench bottom to provide uniform bearing and support for the bottom quadrant of each section of pipe.
  - c. Excavate bell holes at each joint to eliminate point bearing.
  - d. Remove stones greater than 6 inches in any dimension from the bottom of the trench to avoid point bearing.
7. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of

excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.

8. Where trenching and backfilling for a new pipe in place of an existing pipe along the same route, removal of the existing pipe shall be included under this item.

C. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.
3. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project. Moving this excess material from one portion of the Project and placing it in another portion of the Project will be at no additional cost to the Owner.
  - a. Use borrow material if there is no excess of excavated material available at other portions of the Project.
4. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
5. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
6. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches.
7. Do not drop large masses of backfill material into the trench endangering the pipe or adjacent utilities.
8. Install pipe in rock excavated trenches on a dense graded stone bedding with a minimum depth of 6 inches. Shape the stone bedding at the pipe bells to provide uniform support. Encase the pipe in the dense graded crushed stone bedding to a grade 6 inches over the top of the pipe and 12 inches on each side of the pipe.
9. Backfill from the bottom of the trench to the centerline of the pipe with the specified material. This initial backfill is to be placed in layers of no more than 6 inches and thoroughly tamped under and around the pipe. This initial backfilling shall be deposited in the trench for its full width on both sides of the pipe, fittings and appurtenances simultaneously.

10. Where excavation is made through permanent pavements, curbs, paved driveways or paved sidewalks, or where such structures are undercut by the excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction.
  11. Place and compact backfill around manholes, vaults, pumping stations, gate boxes or other structures in six inch layers, from a point 1 foot over the pipe. Exercise care to protect and prevent damage to the structures.
- D. Test Pit Excavation
1. General requirements of test pits are specified in Section 02 30 00.
- E. Dewatering
1. Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
  2. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.
  3. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition, at no additional cost to the Owner.
  4. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.
  5. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.
  6. Brace or otherwise protect pipelines and structures not stable against uplift during construction.
  7. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.
  8. If open pumping from sumps and ditches results in “boils”, loss of fines, or softening of the ground, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred at no additional cost to the Owner.

9. Where subgrade materials are unable to meet the subgrade density requirements due to improper dewatering techniques, remove and replace the materials in accordance with Section 31 23 23 at no additional cost to the Owner.
10. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no additional cost to the Owner.
11. Dewatering discharge:
  - a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
  - b. Transport pumped or drained water without interference to other work, damage to pavement, other surfaces, or property. Pump water through a silt filter bag prior to discharge to grade of drainage system.
  - c. Do not discharge water into any sanitary sewer system.
  - d. Provide separately controllable pumping lines.
  - e. The Engineer reserves the right to sample discharge water at any time.
12. Install erosion/sedimentation controls for velocity dissipation at point discharges onto non-paved surfaces.
13. Removal
  - a. Do not remove dewatering system without written approval from the Engineer.
  - b. Backfill and compact sumps or ditches with screened gravel or crushed rock.
  - c. Remove well points and deep wells. Backfill abandoned well holes with cement grout having a water cement ratio of 1 to 1 by volume.

END OF SECTION

SECTION 32 90 03  
LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Restoration of all vegetated areas disturbed during construction including:
  - a. Lawn areas
  - b. Grass surfaces
2. New loam and seed areas
3. Loam, starter fertilizer, lime, lawn seed
4. Mulch

B. Related Sections

1. Section 31 00 00 – Backfill, Compaction, and Dewatering

1.2 REFERENCES

- A. ASTM D5539 – Standard Specification for Seed Starter Mix

1.3 QUALITY ASSURANCE

- A. Place seed only between the periods from April 15<sup>th</sup> to June 1<sup>st</sup>, and from August 15<sup>th</sup> to October 1<sup>st</sup>, unless otherwise approved by the Engineer.

1.4 SUBMITTALS

A. Submit the following for approval:

1. Lawn seed mixture including percent by weight of each seed type, and manufacturer/supplier name.
2. Suitable laboratory analysis of the soil to determine the quantity of fertilizer and lime to be applied.
3. Lime and starter fertilizer application rates based on laboratory soil tests.



- B. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or top soil to be placed on site during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and that metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserves the right to collect and analyze samples from any proposed fill material prior to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained
3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### A. Loam

1. Loam shall consist of fertile, friable, natural topsoil typical of the locality without admixture of subsoil, refuse or other foreign materials and shall be obtained from a well-drained arable site. It shall be such a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter. Topsoil as delivered to the site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees Celsius. The topsoil shall meet the following mechanical analysis:

	PERCENTAGE FINER
1-in screen opening	100
No. 10 mesh	95 to 100
No. 270 mesh	35 to 75
0.002 mm*	5 to 25

\* Clay size fraction determined by pipette or hydrometer analysis.

2. Place a minimum of 4 inches of loam.

#### B. Starter Fertilizer

1. Starter fertilizer shall bear the manufacturer's name and guaranteed statement of analysis, and shall be applied in accordance with the manufacturer's directions.
2. Starter fertilizer shall be Scott's Starter Fertilizer, or equal, with timed nitrogen release to prevent burning.

#### C. Lime

1. Lime shall be an agricultural type ground limestone.
2. Lime shall be pelletized type for prolonged time release to soil.

#### D. Lawn Seed

1. Seed shall be of the previous year's crop.
2. Required ranges:

- a. Purity > 90%
  - b. Germination > 80%
  - c. Crop < 0.5%
  - d. Weed < 0.3%
  - e. Noxious Weed – 0%
  - f. Inert < 8%
3. The standard seed mixture shall be applied at a minimum rate of 175 lbs./acre, 4 lbs./1,000 sf.

OPEN FIELD MIX	% WEIGHT
Red Fescue (Creeping)	60%
Red Top	10%
Crown Vetch	30%

4. All seed shall comply with State and Federal seed laws.
5. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment. Responsibility for satisfactory results rests entirely on the Contractor.

E. Mulch

1. Shall be a specially processed 100 percent Virgin wood fiber mulch containing no growth or germination-inhibiting factors. Wood fiber mulch shall be Second Nature Regenerated wood fiber as by Central Fiber Corporation, Wellsville, KS or equal. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogenous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the wood fiber shall be marked by the manufacturer to show the air dry weight content and not contain in excess of 10 percent moisture.

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. Salvage all existing loam and stockpile at an acceptable on-site location. Under no circumstances shall existing topsoil be removed from the Project site unless specifically identified within the contract documents.
- B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.
- C. Perform a laboratory soil test on the proposed loam before placing any lime, fertilizer, or seed. This work shall be in accordance with ASTM D5539.

- D. Loam surface that has been raked smooth and prepared for sod installation shall be watered as directed by grower for plant species supplied.

### 3.2 LAWN AREAS

- A. Apply fertilizer and lime to the surface of the ground in accordance with the manufacturers' instructions, and based on the results of the certified soils test.
- B. Place the seed using a drop or rotary spreader at the rate recommended by the seed manufacturer for the intended use of the lawn or grass area being restored.
- C. After spreading the seed, lightly rake the surface to work the seed in. The surface shall then be rolled.
- D. All seed on banks and slopes of three to one (3:1) and greater shall be netted and staked.
- E. As sodding is completed in any one section, roll the entire section by making four passes with a hand roller weighing not more than 100 lbs/ft of width.

### 3.3 MAINTENANCE

- A. Maintain loamed and seeded areas by mulching, covering, netting, watering and fencing until an acceptable stand of vegetation is approved by the Engineer.
- B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas. After the grass has started to grow, all areas and parts of areas that fail to show a uniform stand of grass shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass.

### 3.4 SPECIAL CONSIDERATIONS

- A. Following the final top course of paving, all pavement edges, waterways, sidewalks and berms shall be brought to grade with loam, fine graded, raked, seeded, and rolled to the satisfaction of the Engineer. The final surface of the loam backup shall slope away from the surface edge to allow proper sheeting of runoff. The Contractor shall protect, maintain, and repair seeded areas until a satisfactory start of healthy grass is established.

### 3.5 RESTORATION

- A. In locations where the Work passes through existing grass, weed brush or tree-surfaced areas that are not covered by a specific lawn repair item, surface restoration shall be as follows:
  - 1. After completion of backfilling, the existing loam and organic ground cover materials that were salvaged during excavation shall be returned to the top of the trench.

2. After natural settlement and compaction has taken place, the trench surface shall be harrowed, dragged and raked as necessary to produce a smooth and level surface.
3. The area is then to be sowed with “orchard grass” or “rye grass” or other such materials to hold the soil and produce a growth similar to that existing prior to construction.

### 3.6 GUARANTEE PERIOD AND FINAL ACCEPTANCE

- A. At the end of the guaranteed period, inspection will be made by the Engineer upon written request submitted at least 10 days before the anticipated date. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.
- B. After all necessary corrective work has been completed, the Engineer shall certify in writing the final acceptance of the seeded areas.

END OF SECTION