©2024 CDM Smith
All Rights Reserved

SECTION 009113.09 – ADDENDUM NO. 09

1.1 PROJECT INFORMATION

A. Project Name: Horn Pond Water Treatment Plant PFAS Upgrade Project.

B. Owner: City of Woburn, MA.

C. Owner Project Number: IFB 24-15.

D. Engineer: CDM Smith.

E. Engineer Project Number: 0230-266219.

F. Date of Addendum: April 25, 2024.

1.2 NOTICE TO BIDDERS

A. This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.

C. The date for receipt of General Bids is **unchanged** by this Addendum, at same time and location. The date of receipt of Sub-Contracts is **unchanged** by this Addendum.

1. Sub-Contract Bid Date: 11:00 AM, Wednesday, April 10, 2024 (no change)

2. General Contract Bid Date: 11:00 AM, Wednesday, May 1, 2024 (no change)

D. General Contractors are advised to review the Bid Tabulation for Filed Sub-Bids, included as an Attachment to this Addendum. They are further advised to review previous Addenda for Questions and Responses which clarified scope of work for Filed Sub-Bids and the General Contractor, especially items for the Masonry FSB in Addendum No. 04 and Addendum No. 05.

1.3 ATTACHMENTS

A. This Addendum includes the Bid Tabulation for Filed Sub-Bids (1 page) (new).

B. Existing Pureflow Filter Cut Sheet.

C. Existing Pureflow Filter Media Materials Safety Data Sheet (MSDS).

D. Section 007300.13 “Supplementary Conditions” (22 pages) (reissued).

E. Section 310900 “Geotechnical Instrumentation and Monitoring” (12 pages) (new).

F. Section 315000 “Excavation Support and Protection” (10 pages) (new).

G. Section 013529 “Health, Safety, and Emergency Response Procedures” (10 pages) (new).

H. Section 026110 “Excavation and Management of Excess Soils” (8 pages) (new).

I. Section 028100 “Transportation and Disposal of Excess Materials” (7 pages) (new).

1.4 REVISIONS TO PREVIOUS ADDENDA

A. CLARIFICATION: On Article 1.9.C of Addendum No. 06: the response was in reference to the special soil and concrete testing and inspections required on Sheets SD-S-8 and SD-S-9 of the Drawings.

1.5 REVISIONS TO DIVISION 00 PROCUREMENT REQUIREMENTS AND CONTRACTING REQUIREMENTS

A. REPLACE: Section 007300.13 “Supplementary Conditions” (reissued in its entirety)

1.6 REVISIONS TO DIVISION 01 GENERAL REQUIREMENTS

A. INSERT: Section 013529 “Health, Safety, and Emergency Response Procedures” (new).

1.7 REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS

A. INSERT: Specification Section 026110 “Excavation and Management of Excess Soils” (new).

B. INSERT: Specification Section 028100 “Transportation and Disposal of Excess Materials” (new).

C. INSERT: Specification Section 310900 “Geotechnical Instrumentation and Monitoring” (new).

D. INSERT: Specification Section 315000 “Excavation Support and Protection” (new).

E. Section 323223 “Segmental Retaining Walls,” (not reissued).
   1. DELETE: Article 2.3.G, INSERT: Article 2.3.G, below:
      a. G. Precast modular block units shall be Roman Pisa® as manufactured by Ideal Concrete Block Company, 232 Lexington Street, Waltham, Massachusetts 02452, (781) 894-3200, www.idealcocnreteblock.com or approved equal.

1.8 REVISIONS TO DRAWING SHEETS

A. Drawing Sheets C-11, and C-13, and C-14: Remove the 12” OVF-DI connection between the 5-FT Manhole (receives overflow from Reclaim Tank No. 3 via two 8” lines) and CB-1 (Sheet C-

11 and C-13 not reissued). On Sheet C-14, remove 12”-OVF-DI shown in Profile 9 (Sheet C-14 not reissued).

B. Drawing Sheet CD-3: Remove the 12” OVF-DI pipe shown in Detail 2 entering the Precast Gutter Inlet Catch Basin at INV EL 41.94 (Sheet CD-3 not reissued).

1.9 QUESTIONS AND ANSWERS

A. **Question:** Please clarify who is responsible for supplying a Builders Risk Policy for this project. Will it be the General Contractor or the Owner? Supplemental Conditions SC-6.04a deleted paragraph 6.04a of the general conditions which indicated that the General Contractor was responsible for to obtain a builder’s risk policy and added an Owner Protective Liability policy by the GC.

Response: It is the General Contractor’s responsibility to provide the Builder’s Risk Policy per Article 6.04.A of Specification Section 007200 “General Conditions.” Section 007300.13 “Supplementary Conditions” is reissued in its entirety with this Addendum and has been modified to resolve confusion with the Builder’s Risk Policy. Please see Article 1.3.D and Article 1.5.A of this Addendum for revisions to the Project Manual.

B. **Question:** If Builders Risk Insurance is to be supplied by the General Contractor, the supplemental conditions SC-6.05A added paragraph 15 which indicates that loss of profits and soft cost coverage is required. Please define the limit of loss of profits and soft cost coverage required if the General Contractor is to supply a Builders Risk Policy.

Response: Section 007300.13 “Supplementary Conditions” is reissued in its entirety with this Addendum and has been modified to remove requirement of soft cost coverage. Please see Article 1.3.D and Article 1.5.A of this Addendum for revisions to the Project Manual.

C. **Question:** Since there is insufficient boring and geotechnical data available, how will removal and replacement of existing fills be paid for if encountered? The borings suggest there is potentially fill within the GAC building. Will this material need to be removed and replaced with structural fill?

Response: Please refer to Addendum No. 8 for revisions to the Project Manual which provide more information on available geotechnical data. The Contractor is responsible for removal of inadequate subgrade material. Any inadequate subgrade material located beneath footings should be removed and replaced with compacted Structural Fill. Beneath slabs on grade, the inadequate subgrade material should be removed up to a depth of 3 feet below the bottom of the slab and replaced with compacted Structural Fill. This assumes that the material at 3 feet below the bottom of the slab is granular and free of organic material, buried structures, and other deleterious matter (debris). Buried pipes or other structures below footings or slabs should be removed and replaced with compacted structural Fill. Prior to backfilling, subgrades should be proof-compacted with several passes using a vibratory plate compactor or roller.

D. **Question:** Please provide a disposal site for the existing Pureflow media that is to be removed from the existing Pureflow Filters. Is there a cut sheet on these filters for review? Please provide quantities on the new media that is to be installed.

Response: Contractor to identify a suitable disposal site for existing granular media removed from the Pureflow filters that meets all local, state, and federal requirements for transportation and disposal of material. Material is assumed to be non-hazardous. Comply with any testing requirements imposed by the disposal site to classify material. Specification Section 013529 "Health, Safety, and Emergency Response Procedures," Section 026110 "Excavation and Management of Excess Soils," and Section 028100 "Transportation and Disposal of Excess Materials" have been added by this Addendum. Refer to Article 1.3, Article 1.6, and Article 1.7 of this Addendum for revisions to the Project Manual.

A cut sheet for the existing Pureflow Filter Vessels and the Material Safety Data Sheet for the existing Pureflow media are included as Attachments to this Addendum (see Article 1.3). Approximately 70,000 lb of dewatered media (combined support media, PM-200 media, and anthracite) is expected per vessel for a total of 210,000 lbs for the project. Contractors are advised to reach out to Tech Sales NE, the local representative for Pureflow, for questions/pricing of media and installation services.

E. **Question:** Engineered Support of Excavations will be required for the reclaim tank, GAC Building, and utilities. Are there any concerns with vibration (monitoring) for existing utilities and structures? If so, please provide a specification.

Response: Specification Section 310900 "Geotechnical Instrumentation and Monitoring" (new) is provided as an Attachment to this Addendum. Please refer to Article 1.3 and Article 1.7 of this Addendum for revisions to the Project Manual.

F. **Question:** Engineered Support of Excavations will be required, can a specification section be provided covering this?

Response: Specification Section 315000 "Excavation Support and Protection" (new) is provided as an Attachment to this Addendum. Please refer to Article 1.3 and Article 1.7 of this Addendum for revisions to the Project Manual.

G. **Question:** Reference Specification 311000, paragraph 3.8.A, Since there will be excess soil from excavations, who will be responsible for testing soil for absence/presence of metals, regulated, or hazardous soils? If not by the Owner, how will testing, transportation, and disposal be paid for?

Response: Testing of excess soils for absence/presence of metals, regulated, or hazardous soils is responsibility of the Contractor. Transportation and disposal of excess soils is also the responsibility of the Contractor. The Contractor shall assume excess soil will classify as RCS-1 for bidding purposes. Specification Section 026110 "Excavation and Management of Excess Soils" and Section 028100 "Transportation and Disposal of Excess Soils" are issued with this Addendum. Please refer to Article 1.3, Article 1.6, and Article 1.7 of this Addendum for revisions to the Project Manual.

To clarify, the response for Item 1.9.C from Addendum No. 06 was in reference to the special soil and concrete testing and inspections required on Sheets SD-S-8 and SD-S-9 of the Drawings. Please refer to Article 1.4.A of this Addendum for clarification.

H. **Question:** In reference to Section 007200 "General Conditions", Section 6.05.A and Section 6.05.B and Section SC-6.04.B (Supplemental Conditions) all state that the insurer will have no rights of recovery against any insureds thereunder, or against Engineer. Please confirm

Builder's Risk coverage will be accepted without this waiver of subrogation rights against Engineer.

Response: Section 007300.13 "Supplementary Conditions" is reissued in its entirety. Please see Article 1.3.D and Article 1.5.A of this Addendum for revisions to the Project Manual.

I. **Question:** In reference to Section 007300 "Supplemental Conditions", SC 6.05.A requests for items 15 and 17 to be added to the list of items in Paragraph 6.05.A (of the General Conditions). There is no list of items in Paragraph 6.05.A. Please provide list of items numbered 1-14 and 16.

Response: Section 007300.13 "Supplementary Conditions" is reissued in its entirety with this Addendum. The paragraphs referenced have been removed. Please see Article 1.3.D and Article 1.5.A of this Addendum for revisions to the Project Manual.

J. **Question:** Please advise what the Owner's soft cost limit is under the Builder's Risk Coverage.

Response: Section 007300.13 "Supplementary Conditions" is reissued in its entirety with this Addendum. The paragraphs referenced have been removed. Please see Article 1.3.D and Article 1.5.A of this Addendum for revisions to the Project Manual.

K. **Question:** Please advise which model block is specified from Ideal Block for site retaining walls.

Response: The City would like to match in appearance, as closely as practicable, the existing segmental block retaining walls. As such, the basis of design for segmental block retaining walls is the Roman Pisa® product from Ideal Block (formerly Ideal Concrete Block Company, Waltham, MA). Please refer to Article 1.7.E for revisions to the Project Manual.

END OF DOCUMENT 009113.09

©2024 CDM Smith
All Rights Reserved

THIS PAGE INTENTIONALLY LEFT BLANK

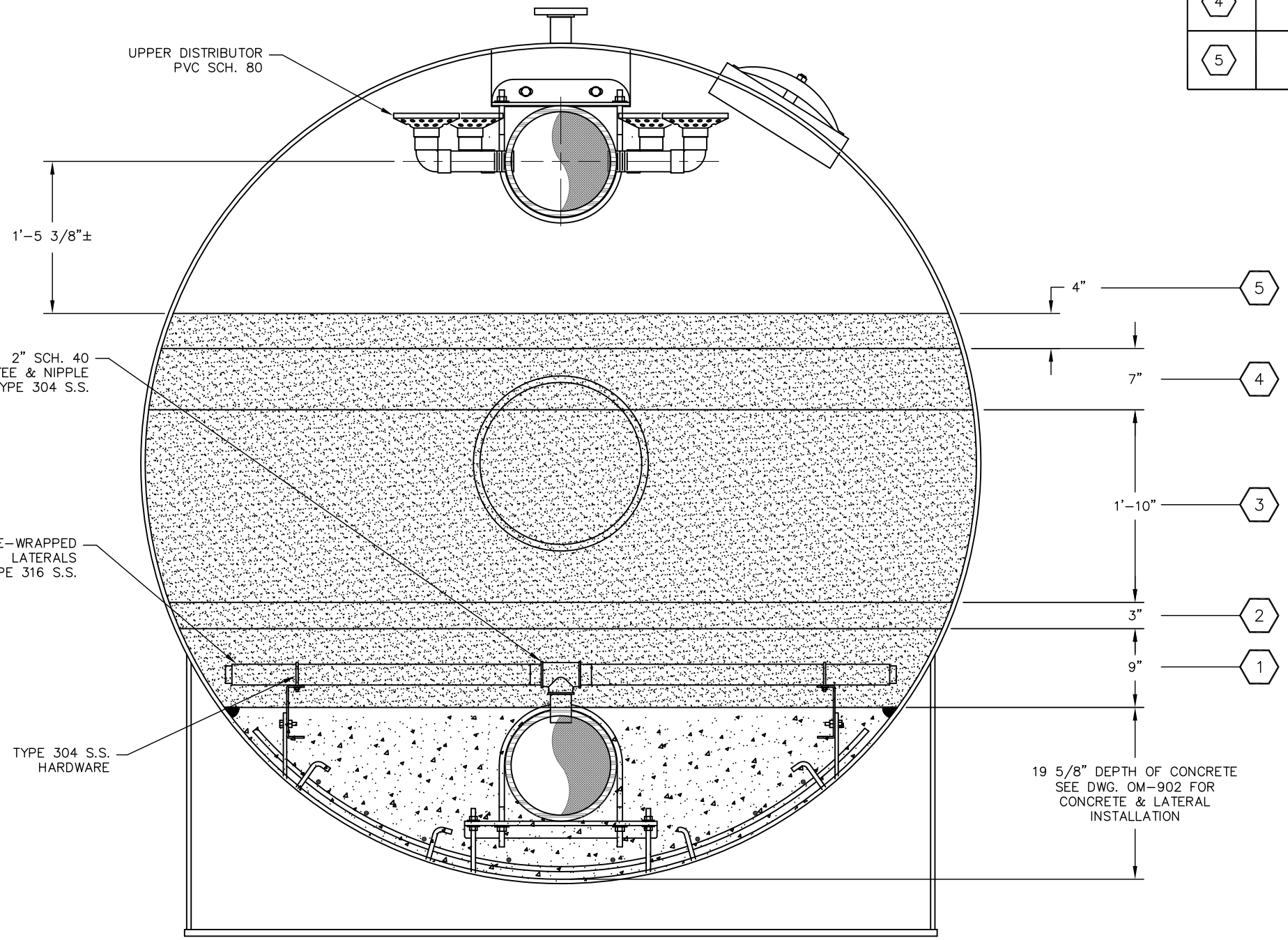
WOBURN, MA
HORN POND WTP PFAS UPGRADE
DWSRF - 12538/IFB 24-15

Filed Subbidder	Bid Price	DCAM Eligibility Certificate / Update Statement	Bid Bond	Sub-Sub Bidders (Paragraph E)	Receipt of Addenda 1 & 2	Restrictions/ Exclusions
Section 040001—Masonry						
Empire Masonry	$ 1,831,000.00	Yes	Yes	Not Required	Yes	None
Marmelo Brothers	$ 1,844,000.00	Yes	Yes	Not Required	Yes	None
Section 050001—Miscellaneous and Ornamental Iron						
L&L Iron	$433,400.00	Yes	Yes	Not Required	Yes	None
Methuen Construction	$307,960.00	Yes	Yes	Not Required	Yes	May only be used by Methuen Construction
Section 070001—Waterproofing, Damp-proofing and Caulking						
PJ Sillane Company, Inc	$176,800.00	Yes	Yes	Not Required	Yes	None
Beacon Waterproofing & Restoration, Inc.	$163,275.00	Yes	Yes	Not Required	Yes	May be used by any general bidder except G.V.W
Section 070002—Roofing and Flashing						
Stanley	$453,000.00	Yes	Yes	Not Required	Yes	None
Section 099100—Painting						
John W Egan Co. Inc.	$177,000.00	Yes	Yes	Not Required	Yes	May be used by any general bidder except Vanguard and CTA
Keltic Painting Score	$177,700.00	Yes	Yes	Not Required	Yes	None
SOEP	$155,980.00	Yes	Yes	Not Required	Yes	None
Section 220001—Plumbing						
Araujo Bros. Plumbing	$161,500.00	Yes	Yes	Not Required	Yes	May be used by any general bidder except Waterline Industries
Section 230001—HVAC						
CAM HVAC	$607,000.00	Yes	Yes	Required - Completed	Yes	May be used by any general bidder except New England Builders and B C Construction
Section 260001—Electrical						
~~AMP Electrical~~	~~$1,297,000.00~~	~~Yes~~	~~Yes~~	Required - Not Completed*	~~Yes~~	~~May be used by any general bidder except Waterline Industries~~
Griffin Electric	$1,723,901.00	Yes	Yes	Required - Completed	Yes	None

*Including Sub-sub bidders (Paragraph E) on bid form is required for this subtrade. Indicating N/A in this field disqualifies this bid

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION WITH ALL RIGHTS & TITLES RESERVED AND MAY NOT BE REPRODUCED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF PUREFLOW FILTRATION DIVISION.

MEDIA INFORMATION		APPROX. DEPTH	QTY. LBS. PER UNIT	# BAGS PER UNIT
1	PF 80 – 120	9"	14,000	280
2	PF 250	3"	6,000	120
3	PM 100	22"	22,000 ⚠6	11 ⚠6
4	PF 600	7"	11,000	220
5	ANTHRACITE	4"	2,652	51



Pureflow FILTRATION DIV.
CALIFORNIA ENVIRONMENTAL CONTROLS, INC.
6739 SOUTH WASHINGTON AVENUE
WHITTIER, CALIFORNIA 90608
(800) 926–3426 (562) 945–3425
Fax: (562) 693–5257
E–mail: pureflow@pfdiv.com

CDM
MANCHESTER, NH.

ENGINEERS

R. H. White
Construction Co., Inc.

CONTRACTOR

REVISIONS

DESCRIPTION	DATE	APP
ENG CHGS	9/24/10	A.S.
ENG CORRECTIONS	12/2/10	A.S.
⚠6 REV PM–100 QTY	3/17/11	

CITY OF
WOBURN, MA.

CLIENT

HORN POND
IRON & MANGANESE
WTP UPGRADE

PROJECT

C–3000 FILTER
MEDIA INSTALLATION

TITLE

DRAWN BY	S. JOHNSON
CHECKED BY	A. SALAMI
APPROVED BY	A. SALAMI
DATE	11/6/09
DRAWING NO.	**OM-901**
'B' SIZE SCALE	NONE
JOB NO.	**2923**
SHEET 1 OF 1	REVISION **C**

Underwriters Laboratories Inc.

FDNP.MH25516
Drinking Water System Components

Page Bottom | Print-friendly version | Questions? | Previous Page

Drinking Water System Components

See General Information for Drinking Water System Components

MH25516

PUREFLOW FILTRATION, DIV OF
CALIFORNIA ENVIRONMENTAL CONTROLS INC
6739 S WASHINGTON AVE
WHITTIER, CA 90601 USA

ANSI/NSF STANDARD 61

Process Media

Trade Dsg	Water Contact Temp	Water Contact Mtl	Surface Area to Volume Ratio
PM-100	23	Filter Media	-

Last Updated on 2005-05-04

Page Top | Notice of Disclaimer | Questions? | Previous Page

UL Listed and Classified Products | UL Recognized Components | Products Certified for Canada

This page and all contents are Copyright © 2005 by Underwriters Laboratories Inc.®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2005 Underwriters Laboratories Inc.®"

PUREFLOW FILTRATION DIV.

Phone: 800-926-3426

MSDS No.: 2712
Date Prepared: 11/06
This Revision: 03/11

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material / Product Name(s): **PM-100 (test)**
CAS Number: 1309-48-4
Chemical Family: Inorganic Oxide
General Use: For use in Iron, Manganese, and Arsenic removal filters for potable water treatment.
Manufacturer / Supplier: PUREFLOW FILTRATION DIV.
6739 S. Washington Ave.
Whittier, CA 90601

SECTION 2. INGREDIENTS / COMPOSITION

Ingredient name:	CAS Number:	Percent:	IARC/NTP/OSHA:	Exposure Limits:
PM100	o1309-48-4	98	No	Nuisance Particulate OSHA PEL:TWA 15mg/m^3;respirable: 5mg/m^3. ACGIH TLV:TWA Total dust:10mg/m^3; respirable dust: 5mg/m^3. 25 - 50 Nuisance Particulate ACGIH TLV:TWA repirable quartz 0.05mg/m^3.

Typical Chemical Analysis, Wt.% (Loss Free Basis)
Oxides of silica, iron, aluminum and calcium Mixer 2
PM100 98
The oxides shown in the typical chemical analysis do not exist in the PM100 as free, uncombined oxides, but are combined mineralogically as calcium-magnesium silicates, aluminates and ferrites.

***Quartz.** Product may contain a trace of quartz, a polymorph of crystalline silica, which is classified by IARC as a "Known Human Carcinogen - Group 1". NTP lists respirable crystalline silica amongst substances which may "reasonably be anticipated to be carcinogens".

SECTION 3. HAZARDS IDENTIFICATION

Product hazard class: Not classified as hazardous according to GHS criteria.

HEALTH HAZARD	1 - SLIGHT
FLAMMABILITY HAZARD	0 - MINIMAL
REACTIVITY HAZARD	0 - MINIMAL
PERSONAL PROTECTION	B - Glasses, Gloves

EMERGENCY OVERVIEW:
A predominately brownish, free flowing, granular material. Not a fire or spill hazard. Contact with water may cause product to swell, generate some heat, and burst its container. Low toxicity. Dust is classified as a "nuisance particulate not otherwise regulated".

Target Organs: Chronic overexposure may cause lung damage.
Primary route(s) of entry: Inhalation
Acute effects: Particulate may cause eye and upper respiratory irritation.

HAZARD IDENTIFICATION continues on page 2

PUREFLOW FILTRATION DIV.

Phone: 1-800-926-3426

MSDS ID: 2712
Date Prepared: 11/06
This Revision: 03/11

HAZARD IDENTIFICATION continued from page 1

Chronic effects: Product dust is classified as a "nuisance particulate, not otherwise regulated" as specified by ACGIH and OSHA. The excessive, long-term inhalation of mineral dusts may contribute to the development of industrial bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease.

Signs & symptoms of overexposure:

Eye contact: Particulate is a physical eye irritant.

Skin contact: Low toxicity by skin contact.

Inhalation: Chronic overexposure by inhalation of airborne particulate may irritate upper respiratory system as well as the throat.

Ingestion: An unlikely route of exposure. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea.

SECTION 4. FIRST AID MEASURES

Eye contact: Flush eyes under slow running water for at least 15 minutes making sure eyes are held wide open and moved slowly in every direction. Ensure no solid particles remain in creases of eyelids. If so, continue to wash. If irritation persists, consult an ophthalmologist.

Ingestion: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, treat symptomatically. If bowel obstruction occurs, immediately consult a physician.. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel, since particles may be aspirated into the lungs. Seek immediate medical attention.
The most important symptoms and hazardous effects:

EMERGENCY OVERVIEW: Product contains mechanical irritants to skin, eyes and respiratory tract and may present a nuisance dust hazard. Avoid breathing dust. Avoid contact with skin. Wear protective clothing including gloves, goggles or safety glasses with side shields and NIOSH approved dust mask.

EEFFECTS OF ACUTE EXPOSURE: Dust may irritate eyes, skin, nasal passages and respiratory tract. Ingestion generally causes purging of the bowels, however, swallowing large amounts may lead to bowel obstruction.

EFFECTS OF CHRONIC EXPOSURE: No data available

The protection of first-aiders: No special procedures or protection

Notes to physicians: No special notes to physicians.

SECTION 5. FIRE FIGHTING MEASURES

Suitable fire extinguishing media: Product is not flammable or combustible. Use media appropriate to primary source of fire. Otherwise, use dry chemical, carbon dioxide, water spray or foam..

Specific hazards may be encountered during fire fighting: Wear appropriate protective equipment; avoid breathing fumes or dust; keep upwind.

Special equipment for the protection of firefighters: None known.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Ventilate enclosed spaces and use appropriate respiratory protection

Environmental precautions: Prevent any spillage from entering drains or water courses.

Methods for cleaning up: Sweep or vacuum spilled material in a manner to avoid generation of dust. Reclaim product for re-use, if possible, or collect in containers for disposal in an appropriate manner. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

Handling: Keep container closed when not in use. Avoid contact with eyes. Avoid breathing dust and only use in a well-ventilated area. Consumption of food and beverages should be avoided in work area where product is being used. After handling product, always wash hands and face thoroughly with soap and water before eating, drinking or smoking.

Storage: Store in dry, protected storage. Product is stable under normal conditions of dry storage. Do not allow water to get inside containers; reaction with water will cause product to swell, generate heat, and burst its container. Exposed, unprotected PM100 will absorb moisture and carbon dioxide from the air. Minimize dust generation during material handling and transfer.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Specific engineering controls: Local and general mechanical dust collection and ventilation in accordance with good Engineering practices should be provided to maintain dust levels below permissible exposure levels specified in Section VIII.

Personal protective equipment:

Respiratory Protection: Up to 100 MG/M3: Any dust, mist or fume respirator; any air supplied respirator; or, self-Contained breathing apparatus.

UP TO 250 MG/M3: Any supplied air respirator operated in a continuous flow mode or any powered air supplied respirator with a tight fitting face piece and a high efficiency particulate filter; any self-contained breathing apparatus with a full face piece; any supplied air respirator with a full face piece.

UP TO 7500 MG/M3: Any air supplied respirator with full face piece and operated in a pressure demand or other Positive pressure mode.

EMERGENCY or ENTRY INTO UNKNOWN CONCENTRATIONS: Self-contained breathing apparatus with full face piece and operated in pressure demand mode or air supplied respirator with full face piece operated in a pressure demand or other positive pressure mode in combination with auxiliary self-contained breathing apparatus operated in pressure demand or positive pressure mode.

ESCAPE: Any air purifying full face piece respirator with high efficiency particulate filter or any appropriate escape type self-contained apparatus.

Hand protection:	Dust impervious gloves during manual handling of product.
Eye protection:	Safety glasses with side-shields or tight fitting goggles.
Skin and body protection:	Long sleeves, buttoned collar, long pants extended over shoes or coveralls.
Hygiene measures:	Consumption of food and beverages should be avoided in work area where product is being used. After handling product, always wash hands and face thoroughly with soap and water before eating, drinking or smoking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Dry white powder to granular solid, no odor
Odor:	No odor
Odor threshold:	Not applicable
Melting point:	2800°C (5072°F)
pH value:	~ 10 (saturated solution)
Boiling point/boiling point range:	3582°C (9162°F @ 760 mm Hg
Flammability (solid, gas):	Not applicable
Flash point:	°F °C Not applicable
Test method: Open cup	Not applicable
Decomposition temperature:	>1700°C (3092°F)
Auto-ignition temperature:	Not applicable
Explosion limits:	Not applicable
Vapor pressure:	~ Zero m Hg at 20°C
Vapor density:	Not applicable

PUREFLOW FILTRATION DIV.

Phone: 1-800-926-3426

MSDS ID: 2712
Date Prepared: 11/06
This Revision: 03/11

PHYSICAL AND CHEMICAL PROPERTIES continued from page 3

Density:	3.5 to 3.6
Solubility:	Slightly soluble in water
Partition coefficient (in-octanol/water, log Kow):	Not applicable
Evaporation rate:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Stability: Stable under ambient temperatures and pressures.
Possible Hazardous reactions under specific conditions:
Conditions to avoid: Exposure to water may cause this product to very slowly hydrate over time, during which heat may be generated (exothermic reaction).
Materials to avoid: ACID (Strong) - vigorous reaction, heat generated: CHLORINE TRIFLUORIDE reacts violently, producing flame: PHOSPHORUS PENTACHLOIDE – incandesces brilliantly.
Hazardous decomposition products: If PM-100 is heated to the point of volatilization (i.e. >1700°C), PM-100 RUMES may be generated.

SECTION 11. TOXICOLOGICAL INFORMATION

Routes of exposure: Inhalation via nose (nasal passages), throat, lungs; also skin and eye contact.
Symptoms: **INHALED DUST**: sneezing, coughing, discolored sputum.
INHALED FUME: metal fume fever has influenza-like symptoms including fever, chills, perspiration, cough, nasal irritation, chest pain, nausea, headaches, vomiting and muscular weakness.
EYE CONTACT: redness, tearing, conjunctivitis
SKIN CONTACT: drying, chapping, dermatitis
Acute toxicity: PM-100 Dust: No data available (dust)
Chronic Toxicity or long term toxicity: Not designated carcinogenic by NTP, IARC, or OSHA. As with exposure to any environment without adequate personal protection, inhalation of PM-100 dust may aggravate any pre-existing respiratory disease; prolonged/frequent skin contact may lead to dermatitis. PM-100 is negative in the standard Ames microbial mutagenicity assay both with and without metabolic activation.

SECTION 12. ECOLOGICAL INFORMATION

Ectotoxicity:	No data available
Persistence and degradability:	No data available
Bioaccumulative1 potential:	No data available
Mobility in soil:	No data available
Other adverse effects:	No data available

SECTION 13. DISPOSAL INFORMATION

Methods of Waste Disposal: Dispose according to local, state/provincial and federal regulations.

If discarded in its purchased form, this product would not be hazardous waste either by listing or by characteristic.

However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFS 261.20-24)

SECTION 14. TRANSPORT INFORMATION

United Nations number (UN) No.: Not regulated under DOT. This product does not meet the criteria of any classification under Section 3 nor is it specifically listed as dangerous goods in Section 4.2 under IATA *Dangerous Goods Regulations.*

MSDS continues on page 5

PUREFLOW FILTRATION DIV.

Phone: 1-800-926-3426

MSDS ID: 2712
Date Prepared: 11/06
This Revision: 03/11

TRANSPORT INFORMATION continued from page 4

UN proper shipping name:	Not applicable
Transport hazard class(is):	Not applicable
Packing group:	Not applicable
Marine pollutant *Yes/No):	No
Specific transport measures and precautionary conditions:	Not applicable

SECTION 15. REGULATORY INFORMATION

Applicable regulations: All of the ingredient(s) contained in this produce are included in the following inventory and/or regulatory lists:

Australian Inventory of Chemical Substances (ACIS): 1309-48-4
Canada-Domestic Substance List (DSL): 1309-48-4
Canada – WHMIS: Ingredient Disclosure (PM-100 FUME) 1% item 959 (1314).
European Inventory of Existing commercial Chemical Substances (EINCS): 215-171-9
Japan – Existing and New Chemical Substances (ENCS): 1-465 (PM-100 FUME)
Korea – Existing and Evaluated Chemical Substances (KECL): KE-22728 (PM-100 FUME)
Philippines Inventory of Chemical Substances (PICCS) -: Present (PM-100)
Swiss Giftliste 1 (List of Toxic Substances 1), 31 May 1999 – G-2368 Toxic Category 4: Acute oral lethal dose of 500 – 2000 mg/kg
US Toxic Substances Control Act (TSCA) 8(b) Inventory List: 1309-48-4

***US REPORTING REQUIREMENTS*;**
CERCLA Hazardous Substance: No
SARA Title III: Section 311/312 – Categories: PM-100 – Acute hazard (nuisance dust)
Section 312 – Inventory Reporting: Although not specifically listed, PM-100 does meet the definition of a hazardous material under OSHA's Hazard Communication Standard at 29 DFR 1910.1200, and therefore is subject to Tier I and /or Tier II annual inventory reporting.
Section 313 – Emission Reporting: This notification must not be detached from this MSDS and any copying and redistribution of this MSDS must include this notice, as required by 40 CFR part 372:
PM-100 is not subject to form R reporting requirements.
Section 302 – Extremely Hazardous Substances: PM-100 is not listed.

US CLEAN AIR ACT:
This product complies in all respects to the requirements of Section 611 of title VI (Stratospheric Ozone Depletion) of the Clean air Act as amended 1990; namely, that the product neither contains, nor is "manufactured with" (as defined by U.S. EPA) any Class I or Class II Ozone Depleting Substances listed in Title VI, and therefore is not required to carry the warning stated as dictated in the amended Act.

STATE LISTS:

California Directors List of Hazardous Substances (8 CCR 339) (PM-100 FUME):	Present
Florida Hazardous Substance List (PM-100 FUME):	Present
Illinois right-to-Know Toxic Substances List (PM-100 FUME):	Present
Massachusetts right to Know List (PM-100 FUME):	Present
NJ Department of Health RTK List (PM-100 FUME):	Present (sn 1144)
Pennsylvania Right to Know List (PM-100):	Present
Rhode Island Hazardous Substance List (PM-100 FUME):	Present (toxic)

SECTION 16. OTHER INFORMATION

REFERENCES USED IN PREPARATION OF MSDS:
LITERATURE ACGIH 2000; RTECS June 1998; Sax-8th Ed.; Ind. Exposure & Control Techn. For OSHA Regulated Substances – PM-100 (FUME), March, 1998, pp. 1181-1184; NIOSH Occupational Health Guide for Chemical Substances – Vol. II, September 1978.

PUREFLOW FILTRATION DIV.

Phone: 800-926-3426

MSDS No.: 2712
Date Prepared: 11/06
This Revision: 03/11

OTHER INFORMATION CONTINUED from page 5

Preparation of MSDS: Name: Ali Salami, P.E.
Address: 6739 S. Washington Ave., Whittier, Ca 90601
Telephone: 562-945-3425

Prepared by: Information prepared from original manufacturer of product.
Date prepared: March 2011

Although reasonable care has been taken in the preparation of the information contained herein, Pureflow Filtration Div. extends no warranties, makes no representation and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

DCC: [illegible]

Date: [illegible]

NSF/ANSI Standard 61 - Drinking Water System Components - Health Effects

Unauthorized Registered Formulation

This product is currently undergoing evaluation for certification and is not authorized until it has been added to the official listing.

Customer Name: WG HEAVY MINERALS INC

Customer Number: 15611

Facility Location: FERNWOOD ID

Facility At: FERNWOOD ID

Facility Number: 15611

Function: Garnet

Size: 5 - 50 mesh

Trade Name(s)

Western Garnet

Category PRMD SECTION 7 PROCESS MEDIA

Material Type: Garnet (GARN)

Temperature: Cold (73 F 23 C)

Sample Notes

Please refer to Standard 61 sampling guide for sampling point and sampling techniques for process media. Please collect 10 lbs (4500 g) of the sample with the greatest surface area or smallest mesh size.

[illegible]

EMERALD CREEK GARNET®

Material Safety Data Sheet
(Complies with 29 CFR 190.1200)

Material Safety Data Sheet

IDENTITY (as used on label and list)

Emerald Creek Garnet® Abrasive Grains and Powders,
Wes-Jet® Garnet Abrasives

SECTION I – Company Identification ----------

Manufacturer's Name
Emerald Creek Garnet Ltd.

Address (Street, City, State, Zip Code)
P.O. Box 190, Fernwood, ID 83830

Emergency Telephone Number
(208) 666-6000

Product Information
(208) 666-6000

W.W. Meyerholtz 6/18/09

SECTION II – Chemical Identity and Information on Ingredients

---

Specific Chemical Identity:

Emerald Creek Garnet® and Wes-Jet® Garnet are a natural mixture of ALMANDINE GARNET, having a chemical composition of $Fe_3Al_2(SiO_4)_3$ with Mn and Mg in partial substitution for Fe in the formula, and other minerals. CAS No.: 1302-62-1 (Almandine).

Hazardous Ingredients:

The following substances are present and regulated by OSHA and ACGIH limits:

SUBSTANCE	WT.%	OSHA/ACGIH LIMIT IN USE*
Nuisance Dust	na	15 mg/m3
Respirable Dust	na	5 mg/m3
Crystalline Silica	<0.5%	0.10 mg/m3

***If these levels are exceeded, adequate respiratory protection must be employed.**

CTION III – Physical and Chemical Characteristics ----------

Melting Point
Circa 1315°C

Specific Gravity (H2O = 1.0)
4.0 – 4.1

Solubility in Water
Insoluble

Appearance and Odor
Deep red to pink color; no odor

SECTION IV – Fire and Explosion Hazard Data ----------

Flash Point (method used)	Flammable Limits	LEL	UEL
Material is a non-flammable solid	not applicable	na	na

Extinguishing Media
Use extinguishing media appropriate for the surrounding fire.

Special Fire Fighting Procedures
As appropriate to surrounding fire. Fire fighters should be protected from nuisance dust.

Unusual Fire and Explosion Hazards
None

SECTION V – Reactivity Data ----------

Stability ( ) Unstable
(x) Stable INERT

Hazardous Decomposition or Byproducts: None known

Hazardous Polymerization ( ) May Occur (x) Will Not Occur

Incompatibility (materials to avoid): None known

Conditions to Avoid: None known. Almandine Garnet is an inert, stable solid needing no special handling in normal use.

WGI Heavy Minerals Inc. Corporate Office •1875 N. Lakewood Dr. Suite 201 Coeur d'Alene, ID 83814 USA

Corporate Office	1-888-5GARNET	Fax +1-208-666-4000
European Sales	+31-78-6820672	Fax +31-78-6812391
minex Sales	+49 (0) 6155-6077-11	Fax +49 (0) 6155-6077-30
Middle East Sales	+9714-88-13067	Fax +9714-88-13068

EMERALD CREEK GARNET®

Material Safety Data Sheet

SECTION VI – Health Hazard Data ----------

Route(s) of Entry	Inhalation	Skin	Ingestion
	Possible	None	None

Health Hazards (acute and chronic due to overexposure)

Inhalation: Dust may cause irritation of nasal and respiratory tract or coughing.
Eyes: Dust may cause irritation.
Skin: May cause abrasions. Dust may cause irritation.
Ingestion: No known effects, however ingestion not recommended.

Carcinogenicity	NTP	IARC Monographs	OSHA Regulations
Crystalline Silica (quartz)	--	No. 42	0.1 mg/m3
Contains less than 0.5%	--	na	

Medical Conditions Generally Aggravated by Exposure

Chronic bronchitis, emphysema and other lung diseases may be aggravated by exposure to nuisance dust.

Emergency and First Aid Procedures

EYE CONTACT: Wash eyes with water to flush out dust particles.
SKIN CONTACT: Wash affected area with soap and water.
INHALATION: Remove from source of dust and obtain other medical assistance.
INGESTION: Obtain medical assistance, if needed.

SECTION VII – Precautions for Safe Handling and Use ----------

Steps to be Taken in Case Material is Released or Spilled

NO SPECIAL PRECAUTIONS ARE NECESSARY. Sweep or vacuum material for disposal. Prevent generation of dust during clean up.

Waste Disposal Methods

Follow local, state and federal guidelines for disposal of inert solid waste.
MATERIAL CONTAMINATED IN USE MAY REQUIRE SPECIAL HANDLING.

Precautions to be Taken in Handling and Storage

NONE --- Use good housekeeping practices to reduce dust; use approved hand, eye and respiratory protection when handling material.

Other Precautions

Use material ONLY for the purposes intended and incorporate methods of dust control to maintain airborne dust within federal or local TLV limits.

SECTION VIII – Control Measures ----------

Respiratory Protection

NIOSH/MSHA approved filters and air supplied hoods for blasters.

Ventilation	Local Exhaust	Mechanical (general)	Special	Other
Yes	Use when blast cleaning	Meet dust TLV	None	None

Protection Gloves	Eye Protection
Leather, or equivalent – in use	Safety glasses with side shields

Other Protective Clothing or Equipment

Hearing protection when working near blast cleaning operations.

Work/Hygienic Practices

Maintain a clean and safe work environment and monitor work practices.

SECTION IX – Special Precautions and Comments

The information provided is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or other warranties, express or implied, with respect to such information and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

WGI Heavy Minerals Inc. Corporate Office •1875 N. Lakewood Dr. Suite 201 Coeur d'Alene, ID 83814 USA

Corporate Office	1-888-5GARNET	Fax +1-208-666-4000
European Sales	+31-78-6820672	Fax +31-78-6812391
Kominex Sales	+49 (0) 6155-6077-11	Fax +49 (0) 6155-6077-30
Middle East Sales	+9714-88-13067	Fax +9714-88-13068

©2024 CDM Smith
All Rights Reserved

SECTION 007300.13 - SUPPLEMENTARY CONDITIONS (MA PROJECTS)
TABLE OF CONTENTS
PART I - AMENDMENTS TO GENERAL CONDITIONS

Article Number	Title
1	DEFINITIONS AND TERMINOLOGY
2	PRELIMINARY MATTERS
3	CONTRACT DOCUMENTS; INTENT, REQUIREMENTS, REUSE
4	COMMENCEMENT AND PROGRESS OF THE WORK
5	SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS
6	BONDS AND INSURANCE
7	CONTRACTOR'S RESPONSIBILITIES
8	OTHER WORK AT THE SITE
9	OWNER'S RESPONSIBILITIES
10	ENGINEER'S STATUS DURING CONSTRUCTION
11	CHANGES TO THE CONTRACT
13	COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK
14	TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK
15	PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD
16	SUSPENSION OF WORK AND TERMINATION
17	FINAL RESOLUTION OF DISPUTES
18	MISCELLANEOUS

PART II - FEDERAL AND STATE PROVISIONS

1.0. FEDERAL GOVERNMENT PROVISIONS

2.0. COMMONWEALTH OF MASSACHUSETTS PROVISIONS

©2024 CDM Smith
All Rights Reserved

SECTION 007300.13 - SUPPLEMENTARY CONDITIONS

PART 1 - AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC Document No. C-700, 2018 edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

SC-1.01A.39.

Delete paragraph 1.01A.39. of the General Conditions in its entirety and replace with the following:

39. Specifications - Sections included under Division 01 through Division 46 of the Project Manual.

ARTICLE 2 - PRELIMINARY MATTERS

SC-2.01C.

Delete Paragraph 2.01C of the General Conditions in its entirety.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01G.

Add the following new paragraph immediately after Paragraph 3.01G. of the General Conditions which is to read as follows:

H. Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though they were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

ARTICLE 4 - COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01A.

Delete Paragraph 4.01A of the General Conditions in its entirety and replace with the following:

A. The Contract Time will commence to run on the twentieth day following the Effective Date of the Agreement.

SC-4.03A.

Add the following new paragraph immediately after Paragraph 4.03A of the General Conditions which is to read as follows:

B. Engineer may check the lines, elevations, reference marks, batter boards, etc., set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered approval of Contractor's work and shall not relieve Contractor of the responsibility for accurate construction of the entire Work. Contractor shall furnish personnel to assist Engineer in checking lines and grades.

ARTICLE 5 - SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01A.

Add the following new paragraph immediately after Paragraph 5.01A. of the General Conditions which is to read as follows:

1. If all lands and rights-of-way are not obtained as herein contemplated before construction begins, Contractor shall begin the Work upon such land and rights-of-way as Owner has previously acquired.

SC-5.03

Delete Paragraph 5.03 A.1 of the General Conditions in its entirety and replace it with the following:

1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents. Engineer has relied upon the data obtained from subsurface investigations made at the site in the form of test borings. Such data is in the form of boring logs which are included in the Section 003132. The locations of the test borings are indicated on the Drawings. Such logs and samples are not part of the Contract Documents. In the preparation of Drawings and Specifications, the Engineer has relied upon the following reports and tests of subsurface physical conditions at the site.

a. Geotechnical Subsurface Explorations and Engineering Recommendations, Horn Pond Water Treatment Plant – PFAS Treatment Building, Woburn, Massachusetts

SC-5.06

Delete Paragraph 5.06A.1 of the General Conditions in its entirety and insert the following:

1. The following reports regarding Hazardous Environmental Conditions at the Site are known to Owner:
a. Pre-Demolition Asbestos and TCLP Sampling Report dated June 13, 2023 (covering Well B Building)
b. Pre-Demolition Asbestos and TCLP Sampling Report dated August 14, 2023 (covering Well A2 Building)

ARTICLE 6 - BONDS AND INSURANCE

SC-6.01B.

Add the following paragraph immediately after Paragraph 6.01B of the General Conditions:

1. Contractor shall furnish Efficiency Guarantee Bonds in accordance with Article entitled MANUFACTURER'S EXPERIENCE in the Instructions to Bidders and executed on forms approved by the Owner.

SC-6.02D

Add the following paragraphs immediately after Paragraph 6.02D of the General Conditions which are to read as follows:

1. Contractor shall provide evidence of its insurance coverage on the ACORD certificate of insurance form and shall include the following statement in its entirety in the section of the form entitled "Description of Operations/Locations/Vehicles/Special Items".

2. The City of Woburn, Massachusetts and CDM Smith Inc., and their subsidiaries, officers, directors, partners, employees and other consultants and subcontractors are named as additional insureds with respect to the insured's Commercial General Liability, Automobile Liability and Pollution Liability Insurance Policies. All insurers waive all rights of subrogation against the City of Woburn, Massachusetts and CDM Smith Inc., their subsidiaries, officers, directors, partners, employees and other consultants and subcontractors. All insurance is primary for all claims covered thereby. Commercial General Liability Insurance includes contractual liability coverage.

SC-6.02.G.

Replace the existing Paragraph 6.02.G with the following:

G. Contractor shall purchase and maintain a separate Owner's Protective Liability policy, issued to Owner at the expense of Contractor, including Owner and Engineer as named insured. This insurance shall provide coverage for not less than the following amounts:

1. Bodily Injury	$1,000,000	Each Occurrence
2. Property Damage	$1,000,000	Each Occurrence
	$1,000,000	Annual Aggregate

SC-6.03

Add new Subparagraph 6.03.A.1 as follows:

1. Contractor's Insurance
    a. Workers' Compensation: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
        1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
        2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
        3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
        4. Foreign voluntary worker compensation (if applicable)

5. Stop Gap Employer Liability for work in ND, OH, WA, WY & Puerto Rico
6. The limits of liability for the workers compensation insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by law.

(1)	Worker's Compensation	Statutory	
(2)	Employer's Liability	$1,000,000 $1,000,000	Each Occurrence Disease per employee
(3)	U.S. Longshoremen's and Harbor Workers' Compensation Act	$1,000,000	
(4)	Admiralty Jurisdiction, Coverage/Program II	$1,000,000	

b. Commercial General Liability – Claims Covered: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:

1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
2. claims for damages insured by reasonably available personal injury liability coverage.
3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
4. Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
5. Products and completed operations coverage:

    1) Such insurance shall be maintained for three years after final payment.
    2) Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

6. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to tort liability and coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
7. Severability of interest.
8. Underground, explosion, and collapse coverage.
9. Personal injury coverage.
10. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
11. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
12. There shall be no specific exclusions associated with scope or work or any cross-suit exclusions for Additional Insureds.
13. Commercial General Liability Insurance shall not be less than the following amounts.

Bodily Injury:	$2,000,000	Each Occurrence
	$4,000,000	Annual Aggregate
Property Damage:	$2,000,000	Each Occurrence
	$4,000,000	Annual Aggregate
Personal Injury:	$4,000,000	Annual Aggregate

c. Comprehensive Automobile Liability including all owned (private and others), hired and non-owned vehicles, including contractual liability coverage and MCS-90 endorsement if Contractor is hauling goods:

Bodily Injury	$1,000,000	
Each Person	$1,000,000	Each Accident
Property Damage: Each accident		
[or] Combined Single Limit of	$1,000,000	Each Occurrence

d. Umbrella or Excess Liability:

Per Occurrence	$5,000,000
General Aggregate	$5,000,000

e. Contractor's Pollution Liability:

Each Occurrence	$2,000,000
General Aggregate	$2,000,000

☐ If box is checked, Contractor is required to provide Contractor's Pollution Liability insurance under this Contract.

f. Contractor's Professional Liability:

Each Claim	$1,000,000
Annual Aggregate	$2,000,000

☒ If box is checked, Contractor is required to provide Contractor's Professional Liability insurance under this Contract.

SC 6.03 B

Add a new subparagraph 6.03 B.6 as follows:

6. All policies of insurance required to be provided by the Contractor shall contain provisions that the insurer(s) waive all rights of subrogation against the Owner, Engineer, and their officers, directors, partners and other consultants and subcontractors of each and any of them and other parties identified in the Supplementary Conditions.

SC 6.03 C.1 Additional Insureds

Add the following two sentences to subparagraph 6.03.C.1 of the General Conditions:

The City of Woburn, Massachusetts and CDM Smith Inc., and their subsidiaries officers, directors, partners, employees and other consultants and subcontractors are named as additional insureds. All insurers waive all rights of subrogation against the City of Woburn, Massachusetts and CDM Smith Inc., their subsidiaries, officers, directors, partners, employees and other consultants and subcontractors.

SC 6.04 Builder's Risk and Other Property Insurance

SC-6.04.A.1

Add the following new subparagraph after subparagraph 6.04.A:

1. In addition to Owner, Contractor, and all Subcontractors, include as insureds the following: CDM Smith Inc., and their subsidiaries, officers, directors, partners, employees and other consultants and subcontractors.

2. include by express endorsement coverage of damage to Contractor's equipment.

SC-6.04F

Add Paragraph 6.04.F after Paragraph 6.04E of the General Conditions.

F. All policies required by this Paragraph shall contain provisions to the effect that the insurer(s) waive all rights of subrogation against the Owner, Engineer and their officers, directors, partners, employees and other consultants and subcontractors of each and any of them.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

SC-7.03.

Add the following new paragraphs immediately after Paragraph 7.03C. of the General Conditions, which are to read as follows:

D. This Agreement is subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, Public Law 87-581, 87th Congress. No Contractor or Subcontractor contracting for any part of the Work shall require or permit any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times that person's basic rate of pay for all hours worked in excess of forty hours in such work week.

E. Contractor shall employ only competent persons to do the work and whenever Owner shall notify Contractor, in writing, that any person on the Work appears to be incompetent, disorderly, or otherwise

unsatisfactory, such person shall be removed from the Project and shall not again be employed on it except with the consent of Owner.

F. Contractor and Subcontractors shall, insofar as practicable, give preference in the hiring of workers for the Project to qualified local residents with first preference being given to citizens of the United States who have served in the armed forces of the United States and have been honorably discharged therefrom or released from active duty therein.

G. Contractor and all Subcontractors shall pay to all laborers and mechanics employed for the construction covered by this Contract the minimum rates of pay as determined by the Secretary of Labor in accordance with the Act of March 3, 1931, as amended, known as the Davis-Bacon Act (40 U.S.C. 276a through 276a-7). Furthermore, Contractor and Subcontractors shall adhere to the stipulations and provisions published by the Secretary of Health, Education, and Welfare in "Labor Standards (Federal Water Pollution Control Act)." The Wage Rate Schedule as prepared by the Secretary of Labor and the "Labor Standards" are part of this Contract and are included in PART II of these Supplementary Conditions.

H. Except as may be otherwise required by law, all claims and disputes pertaining to the classification of labor employed on the project under this Contract shall be decided by the governing body having jurisdiction.

I. Contractor and all Subcontractors shall comply with the Regulations of the Secretary of Labor made pursuant to the Anti-Kickback Act of June 30, 1940 (40 U.S.C. 276c) and all amendments or modifications thereto. Contractor and all Subcontractors shall furnish Owner with weekly Statements of Compliance. In case of Subcontracts, Contractor shall cause appropriate provision to be inserted in all subcontracts for the Work which Contractor may let to ensure compliance with said Anti-Kickback Act by all Subcontractors subject thereto, and Contractor shall be responsible for the submission of all Statements of Compliance required of Subcontractors by said Anti-Kickback Act except as the Secretary of Labor may specifically provide for reasonable limitations, variations, and exemptions from the requirements thereof. These Regulations are part of this Contract and are included in PART II of these Supplementary Conditions.

J. Contractor and all subcontractors shall comply with the Massachusetts Prevailing Wage law as contained in M.G.L. chapter 149 sections 26-27 which are included in Part II of these Supplementary Conditions.

SC-7.06I.

Add the following new sentence at the end of Paragraph 7.06I. of the General Conditions to read as follows:

Contractor shall make payments to Subcontractors in accordance with Massachusetts General Law Chapter 30, Section 39F which is included in Part II of these Supplementary Conditions.

SC-7.06L.

Add the following new phrase at the beginning of Paragraph 7.06L of the General Conditions to read as follows:

Except as required otherwise by Massachusetts General Law Chapter 149, Section 44F,

SC-7.08A

Delete the first and second sentences of Paragraph 7.08A of the General Conditions in their entirety and replace with the following:

Contractor shall comply with the guidelines established in the Division of Municipal Services (DMS) Policies, Policy Memorandum No. PM-2 (Permits) included in Part II of the Supplementary Conditions.

SC-7.10A

Add the following new Paragraph 7.10B to the General Conditions to read as follows:

B. Certain materials and supplies to be used in the Work of this Contract may be exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. Contractor shall obtain the proper certificates, maintain the necessary records and otherwise comply with the requirements of Chapter 14 of the Acts of 1966 and any amendments thereto.

SC-7.15A.

Delete the last sentence in Paragraph 7.15A. of the General Conditions in its entirety and replace with the following:

If Engineer determines that the incident giving rise to the emergency action was not the responsibility of the Contractor and that a change in the Contract Document is required because of the action taken by the Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

SC-7.16D.1.

Add the following new sentence at the end of paragraph 7.16.D.1 of the General Conditions to read as follows:

Approval of Shop Drawings for equipment requiring Efficiency Guarantee Bonds will be withheld until the receipt of such Bonds.

SC-7.17A.

Add the following new paragraph immediately after Paragraph 7.17A. of the General Conditions which is to read as follow:

1. The Contractor guarantees that the Work and Services to be performed under the Contract, and all workmanship, materials and equipment performed, furnished, used or installed in the construction of the same shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract Documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of substantial completion. If part of the Work is accepted in accordance with Paragraph 15.04 of the General Conditions, the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

2. If at any time within the said period of guarantee any part of the Work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction or replacements. If the Contractor neglects to commence making such repairs, corrections or replacements to the satisfaction of the Owner within seven (7) days from the date of receipt of such notice, or having commenced fails to prosecute such Work with diligence, the Owner may employ other persons to make said repairs, correction or replacements, and charge the costs, including compensation for additional professional services, to the Contractor.

3. The Contractor's guarantee under Paragraph 7.17A, is in addition to the Contractor's express or implied warranties under this Contract and State law and in no way diminish any other rights that the Owner may have against the Contractor.

SC-7.17E.

Add the following new paragraph immediately after Paragraph 7.17E. of the General Conditions which is to read as follows:

F. Manufacturer's Guaranty/Warranty

1. The Contractor shall obtain the following guaranty/warranty from the manufacturer of all major pieces of equipment furnished and installed on this Project. Such guaranty/warranty shall be for the benefit of Owner and be furnished in writing by the manufacturer. The Contractor's and manufacturer's obligations under this provision are in addition to other express or implied warranties under the Contract Documents and under the law and in no way diminish any other right that the Owner may have against the Contractor or manufacturer for faulty material, equipment or work. The warranty period shall not be interpreted as a limitation on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

2. The manufacturer warrants and guarantees for a period of one year from the date of Substantial Completion, or such longer period that may be specified in the Contract Documents, that all materials and equipment furnished and installed shall be free from flaws, defects in material and workmanship and shall be in conformance with the Contract Documents.

SC-7.18A.

Delete Paragraph 7.18A of the General Conditions in its entirety and replace with the following:

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall defend, indemnify and hold harmless Owner, Engineer and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages (including but not limited to all reasonable fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost or loss or damage:

1. is attributable to bodily injury, sickness, disease or death or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and

2. is caused in whole or in part by any act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or

anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such indemnified party unless caused by the sole negligence of a party indemnified hereunder. If through the omissions or acts of neglect on the part of Contractor, any other contractor or any Subcontractor shall suffer loss or damage on the Work, Contractor shall settle with such other contractor or Subcontractor by agreement or arbitration if such other contractor or Subcontractor will so settle. If such other contractor or Subcontractor shall assert any claim against Owner and/or Engineer, or the officers, directors, members, partners, employees, agents, consultants and subcontractors of each on account of any damage alleged to have been sustained, Owner shall notify Contractor, who shall defend, indemnify and save harmless Owner, Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each against any such claims.

ARTICLE 8. OTHER WORK AT THE SITE

SC-8.03 A

Delete paragraph 8.03 A of the General Conditions in its entirety and replace with the following.

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall not institute any action, legal or equitable, against Owner, Engineer, Engineer's Consultants or the Construction Coordinator or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from Owner, Engineer, Engineer's Consultants or the Construction Coordinator on account of any such damage or claim. If Contractor is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and Owner and Contractor are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, Contractor may make a claim for an extension of times in accordance with Article 12. An extension of the Contract Times shall be Contractor's exclusive remedy with respect to Owner, Engineer, Engineer's Consultants and Construction Coordinator for any delay, disruption, interference or hindrance caused by any separate contractor. This paragraph does not prevent recovery from Owner, Engineer, Engineer's Consultant or Construction Coordinator for activities that are their respective responsibilities.

SC-8.03C.

Delete Paragraph 8.03C of the General Conditions in its entirety and replace with the following.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, Engineer's Consultants, the Construction Coordinator or any person then Contractor shall promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, Contractor shall, to the fullest extent permitted by Laws and Regulations defend, indemnify and hold Owner, Engineer, Engineer's Consultants and the Construction Coordinator harmless from and against all claims, damages, losses and expenses

(including, but not limited to, fees of engineers, architects, attorneys and other professionals, and court and arbitration or mediation costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against Owner, Engineer, Engineer's Consultants or the Construction Coordinator to the extent based on a claim arising out of Contractor's performance of the Work.

ARTICLE 9. OWNER'S RESPONSIBILITIES

SC-9.13

Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions which is to read as follows:

9.13 Owner's Site Representative

A. Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee.

ARTICLE 10 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.03 Resident Project Representative

SC-10.03C.

Add the following new paragraphs immediately after paragraph 10.03B of the General Conditions which are to read as follows:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.

1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.

2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.

4. Liaison:

   a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

6. Shop Drawings and Samples:

a. Record date of receipt of Samples and Contractor-approved Shop Drawings.

b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.

7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

8. Review of Work and Rejection of Defective Work:

a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

9. Inspections, Tests, and System Start-ups:

a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

10. Records:

a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of

equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.

b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.

c. Maintain records for use in preparing Project documentation.

11. Reports:

a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.

b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

14. Completion:

a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.

b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.

c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

D. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.

5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11 - CHANGES TO THE CONTRACT

SC-11.07B.2

Delete paragraph 11.07B.2. of the General Conditions in its entirety.

SC-11.07C.1.

Delete paragraph 11.07C.1 of the General Conditions in its entirety.

SC-11.07C.2.

Delete "15 percent" in the second line of paragraph 11.07C.2.a of the General Conditions and replace with "20 percent".

SC-11.07C.2.b.

In paragraph 11.07C.2.b, before the semicolon add the following words "based on subcontractor's Cost of the Work";

Delete "5 percent" in paragraph 11.07C.2.b of the General Conditions and replace with "7-1/2 percent."

Delete "15 percent" in the third line of paragraph 11.07C.2.c, of the General Conditions and replace with "20 percent" and delete "5 percent" in the seventh line and replace with "7-1/2 percent."

ARTICLE 13 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01B.1.

Delete the second sentence in paragraph 13.01B.1. of the General Conditions in its entirety and replace with the following:

Such employees shall include foremen at the site.

SC-13.01B.1.

Add the following new paragraph immediately after paragraph 13.01B.1. of the General Conditions which is to read as follows:

a. Following award and prior to execution of a construction contract Contractor shall establish, in the Agreement, the Direct Labor Cost percentage. This percentage, where approved by Owner, will be used in the determination of the Direct Labor Cost listed in the Change Order Form included in PART II of the Supplementary Conditions. The Direct Labor Costs are defined to include social security contributions, unemployment, excise and payroll taxes, workers' and workmen's compensation, health and retirement benefits, sick leave, vacation and holiday pay, and cost of premiums for all additional insurance required because of changes in the Work.

SC-13.02.

Delete Paragraph 13.02 of the General Conditions in its entirety.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-14.06A.

Add the following new paragraph immediately after Paragraph 14.06A. of the General Conditions to read as follows:

B. If Owner stops Work under Paragraph 14.06A. Contractor shall not be entitled to any extension of Contract Time or increase in Contract Price.

ARTICLE 15 - PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01B.4.

Add the following new paragraph immediately after paragraph 15.01B.4 of the General Conditions which is to read as follows:

5. Contractor shall furnish evidence that payment received on the basis of materials and equipment not incorporated and suitably stored, has in fact been paid to the respective supplier(s) within sixty (60) days of payment by Owner. Failure to provide such evidence of payment may result in the withdrawal of previous approval(s) and removal of the cost of related materials and equipment from the next submitted Application for Payment.

SC-15.01C.1.

Delete paragraph 15.01C.1 of the General Conditions in its entirety and replace with the following:

1. Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39K, which is included in PART II of these Supplementary Conditions.

SC-15.01D.1.

Add the following new paragraphs immediately after paragraph 15.01D.1. of the General Conditions which are to read as follows:

2. Should Contractor neglect to pay any undisputed claims, made in writing to Owner within thirty days after completion of the Work, but continuing unsatisfied for a period of ninety days, Owner may pay such claim and deduct the amount thereof from the balance due Contractor. Owner may also, with the written consent of Contractor, use any monies retained, due, or to become due under this Contract for the purpose of paying for both labor and materials for the Work, for which claims have not been filed.

3. Security is provided both by the Payment Bond and the power of Owner to retain any monies for claims, but payment by one shall in no way impair or discharge the liability of the other.

4. All monies paid by Owner in settlement of liens, with the costs and expenses incurred by Owner in connection therewith, shall be charged to Contractor, shall bear interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank, and shall be deducted from the next payment due Contractor under the terms of this Contract.

SC-15.02

Add the following new paragraphs immediately after Paragraph 15.02A of the General Conditions which are to read as follows:

B. No materials or supplies for the Work shall be purchased by Contractor or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. Contractor warrants that Contractor has good title to all materials and supplies used by Contractor in the Work, free from all liens, claims or encumbrances.

C. Contractor shall defend, indemnify and save Owner and Engineer harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. Contractor shall at Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If Contractor fails to do so, then Owner may, after having served written notice on the said Contractor either pay unpaid bills, of which Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to Contractor shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon Owner to either Contractor or Contractor's Surety. In paying any unpaid bills of the Contractor, Owner shall be deemed the agent of Contractor and any payment so made by Owner shall be considered as payment made under the Contract by Owner to Contractor and Owner shall not be liable to Contractor for any such payment made in good faith.

SC-15.06B.

Delete paragraph 15.06B of the General Conditions in its entirety and replace with the following:

Engineer's Review of Final Application and Recommendation of Payment: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents,

Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will indicate in writing Engineer's recommendation of payment and present the Application to Owner for payment. Thereupon Engineer will give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of paragraph 15.07. Otherwise, Engineer will return the Application to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, Owner shall in accordance with the applicable laws and regulations, pay Contractor the amount recommended by Engineer.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

SC-16.02A.4.

Add the following new paragraph immediately after paragraph 16.02.A.4 of the General Conditions which is to read as follows:

5. If Contractor abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified.

ARTICLE 17 - FINAL RESOLUTION OF DISPUTES

SC-17.01A

Insert new paragraph 17.01A.3 of the General Conditions as follows:

3. Either Owner or Contractor may request mediation of any Claim. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of this Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract.

SC-17.01B.

Add a new paragraph immediately after paragraph 17.01B. of the General Conditions which is to read as follows:

C. Contractor shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings, unless otherwise agreed by Contractor and Owner in writing.

ARTICLE 18 - MISCELLANEOUS

SC-18.10

Add the following new paragraphs immediately after Paragraph 18.10 of the General Conditions which are to read as follows:

18.11 Addresses

A. Both the address given in the Bid Form upon which this Agreement is founded, and Contractor's office at or near the site of the Work are hereby designated as places to either of which notices, letters,

and other communications to Contractor shall be certified, mailed, or delivered. The delivering at the above-named place, or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the post office department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon Contractor; and the date of said service shall be the date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor, and delivered to Owner and Engineer. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon Contractor personally.

18.12 Wage Rates

A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. Copies of the wage schedules are included in PART II of these Supplementary Conditions. If, after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administrating the laws mentioned above. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. Contractor shall notify Owner of Contractor's intention to employ persons in trades or occupations not classified in sufficient time for Owner to obtain approved rates for such trades or occupations.

B. The schedules of wages referred to above are minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of the applicable rate contained in these Contract Documents. All disputes between Contractor and employees of Contractor in regard to the payment of wages in excess of these specified in the schedules shall be resolved by Contractor.

C. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the work.

D. Both Federal and State schedules of minimum wage rates are included in PART II of these Supplementary Conditions. Where rates differ, the higher rates shall apply as a minimum for that trade.

PART 2 - FEDERAL AND STATE GOVERNMENT PROVISIONS

Federal, State and Local Government Provisions included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with Paragraph 3.01H of the Supplementary Conditions.

1.0. FEDERAL GOVERNMENT PROVISIONS

1.1. Davis Bacon Act Requirements

1.2. Federal Wage Rates

1.3. American Iron and Steel Requirements of P. L. 113-76, the Consolidated Appropriations Act of 2014.

1.4. Build America, Buy America Act Requirements

This project is subject to American Iron and Steel and the Build America, Buy America Act (BABA). The amendments to the Clean Water Act, as part of WRRDA, apply the American Iron and Steel (AIS) requirements to all treatment works projects. Furthermore, Bipartisan Infrastructure Law (BIL) extends this procurement requirement to all State Revolving Fund (SRF) construction projects going forward with the inclusion of the Build America, Buy America Act (BABA). Starting on May 14, 2022, all steel, iron, manufactured products, non-ferrous metals, plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables), glass (including optic glass), lumber, and drywall used in infrastructure projects for federal financial assistance programs must be produced in the United States. MassDEP ensures that the required procurement language is included in contracts and conducts field verifications of project compliance.

1.5. Project Signage

Project signs or other means of publicizing the project to comply with the "Guidelines for Enhanced Public Awareness of SRF Assistance Agreements" issued by the United States Environmental Protection Agency on June 3, 2015, or the "Guidelines for Implementing the Bipartisan Infrastructure Law Signage Term and Condition for the State Revolving Fund Programs" issued by the United States Environmental Protection Agency on December 8, 2022 and revised March 2, 2023, as applicable, regarding the use of signs or other methods of enhancing awareness of SRF project.

2023 BIL guidance: https://www.whitehouse.gov/wp-content/uploads/2022/08/Building-A-Better-America-Brand-Guide.pdf

2015 guidance: https://www.epa.gov/sites/default/files/2016-07/documents/guidelines_for_enhancing_public_awareness_srf.pdf

2.0. COMMONWEALTH OF MASSACHUSETTS PROVISIONS

2.1. Owner and Contractor agree that the following State Government Provisions apply to the work to be performed under this Contract and that these provisions supersede any conflicting provisions of this Contract.

2.2. Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void and of no effect. Where conflict between Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirement shall apply.

2.3. Special Provisions for Disadvantaged Business Enterprises - Massachusetts Department of Environmental Protection, Division of Municipal Services. (Appendix E)

2.4. Massachusetts General Laws

2.4.1. Chapter 30, Section 39F (9 Pages)

2.4.3. Chapter 30, Section 39I (2 Pages)

2.4.4. Chapter 30, Section 39J (2 Pages)

2.4.4. Chapter 30, Section 39K (6 Pages)

2.4.5. Chapter 30, Section 39L (2 Pages)

2.4.6. Chapter 30, Section 39M (8 Pages)

2.4.7. Chapter 30, Section 39N (2 Pages)

2.4.8. Chapter 30, Section 39O (3 Pages)

2.4.9. Chapter 30, Section 39P (2 Pages)

2.4.10. Chapter 30, Section 39Q (4 Pages)

2.4.11. Chapter 30, Section 39R (7 Pages)

2.4.12. Chapter 30, Section 39S (3 Pages)

2.4.13. Chapter 82, Sections 40 and 40A through 40E (11 Pages)

2.4.14. Chapter 82A, Section 1 (3 Pages)

2.4.15. Chapter 149, Section 26 through 27h (28 Pages)

2.4.16. Chapter 149, Section 34 (2 Pages)

2.4.17. Chapter 149, Section 44F (23 Pages)

2.4.18. Chapter 149, Section 44G (2 Pages)

2.4.19. Chapter 149, Section 44J (4 Pages)

2.4.20. Price Adjustments for certain materials in Construction Projects. MGL Chapter 30 Section 38A. (Appendix H – 5 Pages).

2.5. State Wage Rates

2.6. Diesel Retrofit Program Requirements (Appendix B)

2.7. Division of Municipal Services Policies (Currently 16 Policy Memoranda) (Appendix F).

2.8. Department of Environmental Protection Policy for Review of Sewer Line/Water Supply Protection.

END OF SECTION 007300.13

©2024 CDM Smith
All Rights Reserved

THIS PAGE INTENTIONALLY LEFT BLANK

©2021 CDM Smith
All Rights Reserved

SECTION 310900 - GEOTECHNICAL INSTRUMENTATION AND MONITORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes performing pre-construction surveys and installing and monitoring geotechnical instrumentation and survey markers to measure.

1. Performance of excavation support systems.
2. Groundwater levels inside and outside excavation limits.
3. Vertical deformation of ground surface adjacent to and directly over the Work.
4. Vertical and horizontal deformation of existing utilities and structures adjacent to and over the Work.
5. Ground vibration levels at adjacent facilities due to Contractor activities, including but not limited to demolition, pile installation, and rock excavation.

B. Related Requirements:

1. Section 312000 "Earthwork" for earthwork materials and operations.
2. Section 312319 "Dewatering" for dewatering and drainage.
3. Section 312333 “Trenching and Backfilling” for those procedures.
4. Section 315000 "Excavation Support and Protection" for temporary procedures.

1.3 DEFINITIONS

A. Crack Gauges: Gauges mounted across cracks identified on existing structures during the preconstruction survey to monitor the crack width.

B. Deformation Monitoring Points (DMPs): Fixed markers placed on existing utilities and structures to measure both vertical and horizontal movement. Initial coordinate locations and vertical controls are determined by optical survey methods.

C. Excavation Support Monitoring Points (ESMPs): Inscribed marking or fixed makers placed on excavation support systems to measure horizontal movement of the excavation support system.

D. Seismographs: Electronic recording device with vibration transducer capable of monitoring and recording ground vibrations induced by construction activity.

E. Surface Monitoring Points (SMPs): Inscribed marking or approved surveyor's nail installed to measure vertical (elevation) movement.

F. Utility Monitoring Points (UMPs): Steel rod inside fully cased hole that is resting on existing utilities or underground structures to measure movement of the existing underground structure or utility.

1.4 ACTION SUBMITTALS

A. Submit in accordance with Section 013300 “Submittal Procedures”.

B. Submit for the Engineer’s review four weeks prior to instrument installation:

1. Installation Plan and Schedule: Full details and plan/layout of proposed instruments/points, schedule for installing and monitoring instruments/points, equipment types, installation methods, reference points, and monitoring and data reporting schedule for instruments/points, and instrumentation protection.
2. Description of methods for installing and protecting all instrumentation including but not limited to seismographs, crack gauges, monitoring points, and reference points.

C. Installations Records: Within five working days of installing each instrument, submit to the Engineer, specified as-built instrument location and its corresponding installation record sheet.

1. Include in installation record sheet, location with instrument identification numbers, established elevations, initial elevations and coordinates (baseline readings), boring log, installation, and monitoring date and time.
2. Furnish details of installed instruments showing dimensions, materials used, and as-built drawings of each instrument.
3. Submit field calibrations.

D. Reports and Records: Provide reports of monitoring data to the Engineer. include following minimum information:

1. Preconstruction survey.
2. As-installed location plan, installation records, and baseline values for instrumentation.
3. Monitoring data for instruments with plots against threshold values.
4. Weekly records of crack monitors and including photographs with readings.
5. Event reports and summary from vibration monitoring.
6. Discussion and associated action related to results exceeding threshold values.

E. Submit proposed remedial measures to the Engineer of action to be taken in event that instrument Threshold Values are reached.

1.5 INFORMATIONAL SUBMITTALS

A. Submit names, qualifications, and experience of personnel who will install instruments, perform optical level survey and vibration monitoring, read instruments, and report data to the Engineer demonstrating compliance with “Quality Assurance” Article in this Section.

B. Certificates: Submit for each seismograph or other necessary instrument that manufacturer has inspected and tested each instrument before it leaves the factory confirming that it is working correctly without defects or missing parts and current calibration records.

1.6 QUALITY ASSURANCE

A. Geotechnical Instrumentation Engineer Qualifications: Professional engineer registered in Commonwealth in which the work is performed with at least 5 years' experience in installation of specified instrumentation and will supervise and direct technicians and be responsible for instrument installation. Be present at installation sites to direct and supervise installations, oversee instrumentation reading, and supervise geotechnical instrumentation data interpretations.

B. Surveyor Qualifications: Professional Land Surveyor registered in Commonwealth in which the work is performed with at least 3 years' experience in surveying of similar instruments. Establish Deformation Monitoring Points, Surface Monitoring Points, Utility Monitoring Points, and Excavation Support Monitoring Points and take baseline readings.

C. Manufacturer Qualifications: Provide instruments and components from an approved manufacturer currently engaged in manufacturing specified geotechnical instrumentation hardware.

D. Preconstruction Survey Engineer Qualifications: Professional engineer registered in Commonwealth in which the work is performed with at least 5 years' experience in structural evaluations and condition surveys.

E. Technicians Qualifications:

1. Minimum 3 years' experience for personnel responsible for optical level surveys, instrument readings, and report data.
2. Trained in use of seismograph along with reporting results of analyzing and reporting frequency content of seismograph record.
3. Experienced in installation and reading of specified geotechnical instrumentation and equipment.

F. Factory Calibration: Conduct factory calibration on instruments prior to shipment with certification submitted to indicate that test equipment used for this purpose is calibrated and maintained in accordance with test equipment manufacturer's calibration requirements and that, where applicable, calibrations are traceable to U.S. National Institute of Standards and Technology.

1. Include a calibration curve with data points clearly indicated and a tabulation of data. Mark each instrument with a unique identification number.

G. Perform instrument installations in presence of the Engineer.

H. Be responsible for installation, maintenance, and monitoring of geotechnical instrumentation.

PART 2 - PRODUCTS

2.1 DESIGN AND PERFORMANCE REQUIREMENTS

A. Project Requirements:

1. Install geotechnical instrumentation to monitor ground conditions, ground response, and facilities to achieve specified project requirements and prevent damage to facilities potentially affected.
2. Install instrumentation in accordance with approved Instrumentation Schedule.
3. Engineer's monitoring of installed instruments does not relieve Contractor of its obligation to complete project within the requirements specified herein taking necessary additional measurements.

B. Pre-Construction Survey:

1. Prior to start of demolition, excavation work, installation of excavation support and dewatering work, engage the services of an independent licensed professional engineer, to conduct a pre-construction survey of existing structures and conditions within 100 feet of the anticipated demolition, excavation work, installation of excavation support, and dewatering work.

    a. Coordinate activities, issue notices, obtain clearances and provide photographic and secretarial assistance necessary to accomplish the survey.
    b. Give notice in writing, to property owners and representatives of local authorities required to be present at such survey. Notify in writing the dates on which surveys are planned so that representatives are present during the examination. Provide copies of notices to Owner and the Engineer

2. Record observations of the existing conditions for buildings and other structures, which are affected.

    a. Provide the survey consisting of a description of interior and exterior conditions. Locate cracks, damage or other defects existing and include information to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exists, or for defects too complicated to describe in words, photographs shall be taken and made part of the record.
    b. Records of each property examined must be signed by the representatives present and, if practicable, by property owners, whether or not they are present at the examinations.

3. Record of the pre-construction survey shall consist of written documentation, video and photographs of the conditions identified. At the completion of the survey, submit copies of the documentation to Owner.

4. Upon completion of all excavation work, installation of excavation support and dewatering work, the complete a similar examination of properties and structures where complaints of damage have been received or damage claims have been filed. Give notice to interested parties so that they may be present during the final examinations. Records of the final examination shall be signed and distributed as the original pre-construction survey.
5. Retain records in Contractor's file for at least 3 years after completion of the Contract. In the event of damage claims, prepare a report on the particular structures as requested by the Engineer from those notes and photographs and submitted to Owner. Repair damage attributed to Contractor’s activity promptly and completely to property owners’ satisfaction to restore the conditions of the property to that existing prior to work.

C. Provide and facilitate safe access to the instruments at all times. Engineer may perform additional monitoring in a manner that will minimize unnecessary work delays. Allow and facilitate instrument monitoring as required by the Engineer. No claim for lost production time due to this activity will be allowed.

D. Maintain instrumentation. Report damaged or non-functional instrumentation to the Engineer within 24 hours. Replace damaged instruments within 24 hours.

E. Availability of Data:

1. Instrumentation readings shall be collected by the Contractor's Geotechnical Instrumentation Monitoring Firm. Contractor may take their own supplementary readings in addition to those specified.
2. Monitoring data is the property of Owner and is not to be disclosed or published to third parties without Owner's written permission.
3. Contractor is expected to make their own interpretations for their own purposes without additional compensation.
4. Coordinate with the Engineer to verify consistency of collected data.

2.2 INSTRUMENTATION - GENERAL

A. Provide instruments and materials, including readout units, installation tools, materials, and miscellaneous instrumentation components.

B. Provide surface protection for instruments flush with surface in paved or other ground surface areas at the time that work is completed.

C. Minimum Quantity of Instruments: While quantities in following Paragraph are considered minimums, obtain data from instrumentation in quantity to monitor construction, performance, and safety aspects of the Work.

D. Following subparagraphs identify instrument type, minimum number to be provided, and approximate installed depth from below bottom of excavation / tunnel invert:

	Instrument Type:	Number:	Depth:
1.	Seismographs:	1	N/A.
2.	Surface Monitoring Points:	As Needed	N/A.
3.	Deformation Monitoring Points:	As Needed	N/A.
4.	Excavation Support Monitoring Points:	As Needed	N/A.
5.	Crack Gauges	(as req'd to monitor existing cracks)	

E. Locate instruments and obtain approval from the Engineer.

2.3 MONITORING POINTS

A. Surface Monitoring Points (SMPs):

1. Use to monitor vertical deformation at or near ground surface, clearly identifying points with permanent easily readable letters and numbers as approved by the Engineer.

2. Paved Areas: 2 inches long masonry nail, manufactured from hardened zinc–plated steel and driven into an asphalt covered surface. Identify each nail individually with an identification tag or surface marking.
3. Non-Paved Areas: 3 feet by 3/4 inch diameter steel rod driven into ground or set in concrete such that no more than 3 inches of rod is exposed above ground surface. Round top of rod and punch-mark it at its center. Identify each rod with a surface marking.
4. Utility Manholes: Observable cross mark or welded bead on top horizontal surface of manhole rim. Clean surface within 3 inches of point and mark it using fluorescent spray paint adjacent to point to permit easy identification of exact location.

B. Deformation Monitoring Points (DMPs):

1. Use to monitor vertical and horizontal movement of adjacent utilities and structures with following approved by the Engineer.
2. Materials: Nails, screws, reinforcing bars, bolts, and similar materials with well-defined measurement points.
3. Firmly attach and protect from damage and vandalism. Remove or cover points protruding more than 1/4 inch with a protective box or cap.
4. Clearly identify with permanent easily readable letters and numbers.

C. Excavation Support Monitoring Points (ESMPs):

1. Use as fixed markers on vertical elements of excavation support system and to monitor horizontal deformation of excavation support system designed by Contractor.
2. Clearly identified points with permanent easily readable letters and numbers as approved by the Engineer.
3. Clean surface within 3 inches of each point and clearly identify using fluorescent spray paint adjacent to point.

D. Non-Shrink Cement Grout: Suitable for intended application.

2.4 SEISMOGRAPHS

A. Portable for monitoring ground vibrations velocities resulting from construction activities, calibrated within the previous six months, and having following characteristics:

1. Measure three mutually perpendicular components of particle velocity in directions vertical, radial, and perpendicular to vibration source.
2. Measure and display maximum peak particle velocity continuously during vibration-generating activities.
3. Have a low frequency omnidirectional transducer for measuring air blast overpressure with a flat frequency response within the limits of 2 Hertz to 200 Hertz with a tolerance equal to or better than plus or minus 10 percent.
4. Seismic Range: 0.01 inch to 4 inches per second with an accuracy of plus or minus 5 percent of measured peak particle velocity or better at frequencies between 10 Hertz and 100 Hertz, and with a resolution of 0.01 inch per second or less.
5. Acoustic Range: 110 dB to 140 dB (referenced to 20 micro-Pascals) with an accuracy and resolution of plus or minus 1 dB.
6. Frequency Response (plus or minus 3 dB: 2 Hertz to 200 Hertz.

7. Two Power Sources: Internal rechargeable battery and charger capable of supplying power to monitor vibrations continuously for up to 24 hours at 115 volts AC.
8. Self-triggering wave form capture mode that provides plot of wave forms, peak particle velocities, peak overpressure, and frequencies of peaks.
9. Continuous monitoring mode capable of recording single-component peak particle velocities and frequency of peaks with an interval of 1 minute or less.

B. Provide for full-time use on the project during vibration causing construction activities.

2.5 CRACK MONITORS

A. Crack Gauges:

1. Clear plastic plates that are installed on each side of the crack or joint to measure horizontal and vertical movement.
2. Range of at least 1 inch and precision of 1 mm or better.

B. Basis-of-Design Manufacturer - Provide Humbolt Mfg. Model HC-2937, or equal for monitoring width of existing cracks and joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with the Engineer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prior to commencing installation of demolition, excavation support, excavation, and dewatering work, furnish instrumentation and related components that are to be installed during construction and conduct pre-construction surveys.

B. Protect from damage and maintain instruments. Repair or replace damaged instruments.

C. Implement remedial measures based on interpretations of monitoring data program.

3.3 GENERAL REQUIREMENTS

A. Perform a pre-construction survey prior to any dewatering, excavation, demolition, or installation of excavation support.

B. Install instruments at the Engineer approved locations in accordance with approved installation procedures. Engineer may modify instrument locations depending on field conditions and

monitoring objectives. Install instrumentation in accordance with approved installation schedule. Install instruments and obtain baseline data before construction starts.

C. Allow the Engineer access to instrument locations and assistance required in obtaining monitoring data.

D. Clearly mark and label instruments and protected to avoid being obstructed or otherwise damaged by construction operations or general public. Immediately following installation, survey location and top of instruments to provide horizontal and vertical coordinates.

1. Resurvey if the Engineer questions instrument locations.

E. Assign a unique identification number to each instrument and each point that is clearly marked in a non-destructible manner.

F. Initial Reading: Immediately following instrument installation take two sets of initial readings in the Engineer's presence to provide baseline readings and to demonstrate adequacy of completed installation.

3.4 MONITORING POINTS

A. Monitoring Points: Include but not be limited to SMPs, DMPs, and ESMPs. Monitor these control points using surveying methods. Modify locations to meet site constraints with the Engineer's approval.

B. SMPs and DMPs: Install as described below near excavations and open trench locations. Additional SMPs and DMPs, may be required by the Engineer.

C. SMPs:

1. Install in pavement or ground surface within 5 feet along each side of trench excavation that are over 10 feet deep and located within 25 feet of structures. Install at spacing not exceeding 25 feet.
2. Install on rim of utility manhole covers located within 25 feet of open excavations.

D. DMPs:

1. Install on exterior walls of buildings or structures located within 30 feet of open excavations, or 100 feet of pile installation. Preferred installations are on supporting walls or columns. Avoid installation in brick unless no other option exists.
2. As a minimum, install on exterior wall corners of buildings, structures, or property boundary walls at not more than 50 feet spacing. Install additional DMPs to monitor building movement at other locations when determined by the Engineer.
3. Install DMPs in cooperation with property Owners so that installations are inconspicuous and acceptable to them. Existing features of building foundations that are permanent and can be repeatedly surveyed may be substituted for DMPs, if approved by the Engineer.

E. ESMPs:

1. Install on excavation support systems other than trench box along support walls at spacing not more than 25 feet.
2. Install prior to excavation within exaction support system.
3. Read results at least daily during associated excavation and twice a week until backfill is completed.

F. SMPs and DMPs:

1. Obtain two sets of measurements for each monitoring point to establish baseline data within three days of installation. Make at least 24 hours apart, but not more than 48 hours.
2. Check monitoring points with initial surveyed elevations or offsets as appropriate differing by more than 0.08 inch for secure installation and resurvey.
3. Read monitoring points prior to installing excavation support, beginning demolition, excavation, operation of groundwater control system, or start of installation of excavation support at the site.
4. Read daily during demolition, excavation, dewatering, filling and backfilling, and excavation support installation located within 50 feet of the work, then at least twice a week until excavation, dewatering, and backfill has been completed.

G. Crack Gauges:

1. Install on exterior walls of buildings or structures with existing cracks located within 30 feet of open excavations.
2. Install crack gauges in accordance with manufacturer's recommendations and in cooperation with property Owners so that installations are inconspicuous and acceptable to them.

3.5 VIBRATION MONITORING

A. Take seismograph readings during demolition and excavation support installation or other activities causing ground vibrations within 50 feet of existing structures to document that peak particle velocities do not exceed specified limit criteria.

B. Install seismographs near existing structures when vibratory or impact hammers are used for the installation of excavation support within 50 feet of existing structures, and as directed by the Engineer.

3.6 INSTRUMENT PROTECTION, MAINTENANCE AND REPAIR

A. Protect instruments from damage. Replace damaged or destroyed instruments within 72 hours of damage, without additional compensation. If necessary, suspend work in areas being monitored by damaged instrument and take remedial action.

B. Maintain instruments by draining water and flushing debris from under protective covers and keeping covers locked and sealed at all times.

3.7 MONITORING

A. Collect, tabulate, plot, and interpret survey monitoring data and provide the Engineer with tabulated and plotted data. Report status of demolition, excavation, bracing, groundwater levels, and backfilling at time of data collection with each report.

B. Monitoring frequency may be modified as directed and approved by the Engineer.

C. Submit data from readings of monitoring points to the Engineer within 24 hours of reading. Communicate verbally with the Engineer immediately after visual observations or data collection if excessive movements or other anomalies are indicated.

D. For seismograph data, submit a summary report with event summary of peak particle velocity and frequency. Submit a strip chart indicating time and magnitude of maximum single-component peak particle velocity measured during each 5-minute interval of monitoring period. List a summary of vibration producing activities for that week along with specific events causing anomalous readings.

E. Make visual observations of ground conditions and building conditions in site vicinity and communicate immediately with the Engineer if signs of ground or building movements are observed.

F. Engineer may take independent instrumentation measurements. Cooperate with the Engineer during instrumentation monitoring by providing access to instrumentation locations in a timely manner and by providing and maintaining safe means of access to instrumentation locations for data collection. Data acquired by the Engineer will be made available to Contractor in a timely manner.

G. Contractor may make their own interpretations of monitoring data for their own purposes. Do not publish or disclose data or interpretations shall to other parties without advance written permission of Owner.

H. For data collected from an instrument that has been installed to replace a damaged instrument, use formal initial reading as an initial reading for replacement instrument so that data are continuously plotted, without an offset at time of damage. Note time of damage and replacement on plot.

3.8 INTERPRETATION AND RESPONSE VALUES

A. Make interpretations of data resulting from monitoring programs.

B. Threshold and Limiting Values for Instruments:

	Instrument	Threshold Value	Limiting Value
1.	Seismographs:	1.0 in/sec over 40 Hz	2.0 in/sec over 40 Hz
		0.75 in/sec at 30 to 40 Hz	1.5 in/sec at 30 to 40 Hz
		0.50 in/sec at 20 to 30 Hz	1.0 in/sec at 20 to 30 Hz
		0.25 in/sec under 20 Hz	0.5 in/sec under 20 Hz

		25 mm/sec over 40 MHz 19 mm/sec at 30 to 40 MHz 12 mm/sec at 20 to 30 MHz 6 mm/sec under 20 MHz	50 mm/sec over 40 MHz 38 mm/sec at 30 to 40 MHz 25 mm/sec at 20 to 30 MHz 12 mm/sec under 20 MHz
2.	SMPs:	0.5 inch	1.0 inch
3.	DMPs:	0.25 inch	0.5 inch
4.	ESMPs:	1.0 inch	2.0 inches

NOTES: * below bottom of excavation or trenchless crossing.

** at bottom of excavation or trenchless crossing.

C. Values are subject to adjustment by the Engineer as indicated by prevailing conditions or project circumstances. Crack Gauge criteria will be established based upon existing conditions identified during preconstruction survey.

D. If a Threshold Value is reached:

1. Engineer and Contractor will meet to discuss remedial measures.
2. Increase instrument monitoring frequency as directed by the Engineer.
3. Install and monitor additional instruments as directed by the Engineer.
4. Implement remedial measures in event Threshold Value is reached, so Limiting Value is not reached.

E. Take necessary steps so Limiting Value is not exceeded. Engineer may direct Contractor to suspend activities in affected area with exception of those actions necessary to avoid exceeding Limiting Value.

3.9 TOLERANCES

A. Survey Measurements: Initial location of each instrumentation elements consisting of determining elevation and horizontal positions with respect to the Engineer approved benchmarks.

B. Monitoring Points (SMPs, DMPs, and ESMPs):

1. Instrumentation Elevations: Determine to accuracy of plus/minus 0.01 foot.
2. Horizontal Position of Surface Monitoring Points: Determine to accuracy of plus/minus 0.01 foot.
3. Horizontal Position of Deformation Monitoring Points and Excavation Support Monitoring Points: Determine to accuracy of plus/minus 0.01 foot.

C. If actual field conditions prohibit installation at location and specified elevations, obtain prior acceptance from the Engineer for new instrument location and elevations.

3.10 DISPOSITION OF INSTRUMENTS

A. Monitoring Points and Crack Gauges: Remove monitoring points and crack gauges during cleanup and restoration work, unless directed otherwise by the Engineer.

B. Seismographs: Remove units following completion of demolition, installation of excavation support and excavation

END OF SECTION 310900

©2021 CDM Smith
All Rights Reserved

SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Temporary excavation and trench support and protection systems.
2. Delegated design.

B. Related Requirements:

1. Section 013233 "Photographic Documentation" for recording preexisting conditions and excavation support and protection system progress.
2. Section 014000 “Quality Requirements” for testing and laboratory services.
3. Section 310900 “Geotechnical Instrumentation and Monitoring” for monitoring equipment.
4. Section 312000 "Earthwork" for excavating and backfilling.
5. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
6. Section 312319 "Dewatering" for lowering and disposing of ground water during construction and dewatering excavations.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site .

1. Review geotechnical report.
2. Review existing utilities and subsurface conditions.
3. Review coordination for interruption, shutoff, capping, and continuation of utility services.
4. Review proposed excavations.
5. Review proposed equipment.
6. Review monitoring of excavation support and protection system.
7. Review coordination with waterproofing.
8. Review abandonment or removal of excavation support and protection system.

1.4 ACTION SUBMITTALS

A. Shop Drawings: For excavation support and protection system, prepared by or under the supervision of a qualified professional engineer, meeting the minimum performance requirements in Part 2 of this Section.

1. Include overall system plan, indicating clearances, dimensions, material properties, member sizes, locations, spacing and member penetrations depths, and locations of various types of lateral supports.
2. Show details, layout, arrangement, equipment requirements, and method of construction of proposed excavation support system.
3. Indicate existing and proposed utilities, structures, or other obstructions.
4. Show wall elevations and locations of bracing.
5. Show overall installation sequence and removal of bracing. Indicate work levels to be performed before bracing is installed or removed.
6. Method of preloading bracing, if required, including preload for each member, and method of locking-off the preload. Submit detailed drawings of connections, jacking supports, and method of shimming.
   Include procedures for resolving difficulties arising from misalignment of members exposed during excavation and criteria for implementing those procedures.

1.5 DELEGATED DESIGN SUBMITTALS

A. Design Calculations: For excavation support and protection system. Include analysis data prepared, signed, and sealed by professional engineer responsible for their preparation.

1. Include loads on excavation support system for all stages of excavation, bracing removal, and concrete placement, including material and equipment loads on adjacent ground during construction.
2. Include design of wall and bracing members including details for all construction stages.

3. Include theoretical deflections of excavation support system and deformation of structures, pipelines, and other improvements located within areas influencing excavations.

B. Submit to the Engineer for review and acceptance, a plan of action to be implemented in the event any deformation threshold value is reached as specified in Section 310900 “Geotechnical Instrumentation and Monitoring.” Identify positive measures in action plan to further limit wall movement, including but not limited to trenching for struts and wales, placement of granular earth berms against the wall, installation of additional struts, or combinations thereof.

1. Include description and details of mitigating measures, work schedule, location and availability of materials, and structural details for connections to wall and support elements.
2. Be prepared to work 24 hours per day to implement such measures.
3. Perform remedial work and mitigating measures at no additional cost to Owner.

C. Qualifications Statement: Submit qualifications for licensed professional.

1.6 INFORMATIONAL SUBMITTALS

A. Submit quality control measures to ensure that performance of excavation support system complies with project requirements.

B. Qualification Data: For design engineer.

C. Maintain at least one copy of design at job site during excavation that includes a plan indicating sizes, types, and configurations of the materials to be used in protective system. Identity registered Contractor's design engineer who stamped the design.

D. Do not proceed with excavation support or protection activities until submittals have been reviewed and acceptedby the Engineer.

E. Submit inspection documentation:

1. On-site inspections of excavation support system as the systems are constructed.
2. Review of quality control measures and performance data.
3. Certification that excavation support system is constructed per applicable design following completion of each support system and following Contractor modifications during construction.

1.7 QUALITY ASSURANCE

A. Contractor Qualifications: Minimum 5 years' experience compatible to indicated Work, and who employs labor and supervisory personnel similarly experienced in Work of this Section.

B. Contractor's Design Engineer: Registered Professional Engineer in Commonwealth where the work is located with at least 5 years' professional experience in design and construction of support of excavation systems and having completed a minimum of 5 successful excavation support projects of equal type, size, and complexity to specified work.

C. Existing Conditions: Using photographs or video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by inadequate performance of excavation support and protection systems. Submit before Work begins.

D. Regulatory Requirements: Comply with authorities having jurisdiction, including OSHA requirements.

E. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

1.8 FIELD CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Contact utility companies and other responsible authorities to locate and mark underground utilities.
2. Notify Owner no fewer than two days in advance of proposed interruption of utility.
3. Do not proceed with interruption of utility without Owner's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent soil borings and tests, conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection according to the performance requirements.
2. The geotechnical report is referenced elsewhere in Project Manual.

C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 “Quality Requirements,” to perform the delegated design.

B. Provide delegated design, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads within specified movement criteria (Section 310900 “Geotechnical Instrumentation and Monitoring”).

1. Prevent surface water from entering excavations by grading, dikes, or other means.
2. Install excavation support and protection systems to minimize horizontal and vertical movements without damaging existing buildings, structures, and site improvements adjacent to excavation.
3. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

C. Do not permit excavations below the level of the base of adjacent existing foundations or retaining walls, unless excavation design and bracing includes an analysis of stability of structure supported by foundation and if necessary, incorporates required bracing or underpinning of foundation.

D. For support systems in which bracing is installed between opposite sides of the excavation, design excavation support of both sides to be nearly the same as feasible.

E. Where necessary to resist point loads, fill pipe piles used as soldier piles with concrete. Do not consider concrete strength in design of pipe pile for bending stress.

F. Design, install, operate, and maintain ground water control system to control ground water inflows, prevent piping or loss of ground, and maintain stability of the excavation. Refer to the requirements of Section 312319 “Dewatering.”

G. Design review and field monitoring activities by Owner or the Engineer does not relieve Contractor of its work responsibilities.

2.2 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A36/A36M, ASTM A690/A690M, or ASTM A992/A992M.

C. Steel Pipe Used as Soldier Piling: ASTM A252, Grade 2 or better.

D. Steel Sheet Piling: ASTM A328/A328M, ASTM A572/A572M, or ASTM A690/A690M; with continuous interlocks.

E. Steel Liner Plates: ASTM A1101, structural quality hot-rolled carbon steel sheets or plates of either the two- or four-flange type, punched for bolting on all sides. Space bolts according to manufacturer’s standards and be multiples of plate length, so members having same curvature are interchangeable with bolt numbers and patterns determined by liner supplier.

1. Tensile Strength: 42,000 psi.
2. Yield strength: 28,000 psi.

F. Wood Lagging: Lumber, mixed hardwood, nominal rough minimum thickness of 3 inches with minimum allowable flexural strength of 1,100 psi.

G. Cast-in-Place Concrete: ACI 301, with minimum compressive strength of 3,000 psi, unless a higher strength is required for application.

H. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that instrumentation required under Section 310900 “Geotechnical Instrumentation and Monitoring” is installed and initialized prior to start of work required by this Section.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Obtain permits from local authority having jurisdiction prior to initiating excavation work.

B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

C. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
2. Install fencing, gates, lights, and signs around excavations and staging areas to provide for public safety.

D. Locate excavation support and protection systems clear of permanent construction so that construction and finishing of other work is not impeded.

3.3 GENERAL

A. Install excavation support systems in accordance with the shop drawings and applicable permits.

B. Fill voids between excavation support system and earth with materials acceptable to the Engineer.

C. If unstable material is encountered during excavation, take immediately measures to contain it in place and prevent ground displacement.

D. If settlement or deflections of supports indicate that support system requires modification to prevent excessive movements, redesign and resubmit revised shop drawings and calculations to the Engineer without additional compensation.

E. Maintain sufficient quantity of material on site for protection of work and for use in case of accident or emergency.

3.4 PORTABLE TRENCH BOXES

A. Use portable trench boxes or sliding trench shields only for worker protection.

B. Additional excavation, backfilling, and surface restoration required as result of trench box use shall be provided without additional compensation.

C. Design, construct, and maintain trench boxes or shields to meet acceptable engineering and industry standards.

D. Install shields in a manner to restrict lateral or other hazardous movement of the shield in the event of sudden lateral loads.

E. Maintain a written copy of trench box manufacturer's specifications, recommendations, and limitations at job site during excavation work.

3.5 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation.

1. Install using impact hammer or vibratory hammer in predrilled holes.
2. Soldier Piles in Predrilled Holes:

    a. Provide casing or other methods of support to prevent caving of holes and loss of ground.
    b. Backfill with concrete from elevation of bottom excavation to pile tip elevation. Backfill remainder of predrilled hole with lean concrete or sand.
    c. Predrill hole of sufficient diameter allowing for proper alignment and concrete backfilling of pile.

3. Install driven piles with driving shoes where hard driving is anticipated.
4. Advance driven soldier piles without aid of a water jet.

B. Extend soldier piles below excavation grade level to depths shown on reviewed Shop Drawings. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

C. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging.

1. Install lagging so ground loss does not occur between adjacent or below lowest board. As excavation proceeds, do not exceed maximum height of 4 feet for unlagged face of excavation.
2. Do not exceed unlagged face of 2 feet, if water seeps or flows from excavation face or excavation face becomes unstable.

D. Fill voids behind lagging with soil, and compact.

E. Install wales at locations indicated on Drawings and secure to soldier piles.

3.6 STEEL SHEET PILING

A. Thoroughly cleaned and inspect sheet piles for defects and proper interlock dimensions prior to installation. Provide a tool for checking interlock dimensions.

B. Before starting excavation, drive one-piece sheet piling lengths in plumb position and tightly interlock vertical edges for its entire length to form a continuous barrier. Form a continuous diaphragm throughout length of each run of wall, bearing tightly against original ground.

1. Exercise care in driving so interlocking members can be extracted without damaging adjacent structures or utilities.
2. Use driving, cutting, and splicing methods conforming to approved Shop Drawings.

3. Use templates or other temporary alignment facilities to maintain piling line.

C. Accurately place piling, using templates and guide frames unless otherwise recommended in writing by sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 5 feet. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

D. Install each sheet pile having sufficient clearance in interlocks to slide under its own weight into interlock of previously placed sheet pile.

E. Do not excavate in advance of steel sheet piling installation.

F. Where obstructions are anticipated, pre-excavate or pre-drill along sheet pile wall alignment without additional compensation. Do not extend pre-excavation and pre-drilling below lowest excavation level or into bearing soils for existing or future structures.

G. Remove obstructions encountered before the specified embedment for piles. Where obstructions cannot be removed, re-evaluate sheet pile system by Contractor's design Engineer show reduced embedment and additional toe stability measures to be implemented for sheet pile wall realignment. Submittal proposed design measures to the Engineer for review.

H. Withdraw damaged or faulty aligned pilings with provide new piling, driven properly in its place without additional compensation.

I. Cut tops of sheet piling to uniform elevation at top of excavation.

3.7 INTERNAL BRACING

A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work, unless otherwise approved by the Engineer.
2. Install internal bracing if required to prevent spreading or distortion of braced frames.
3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

B. Provide internal bracing to carry maximum design load without distortion or buckling.

C. Include web stiffeners, plates, or angles required to prevent rotation, crippling, or buckling of connections and points of bearing between structural steel members. Allow for eccentricities caused by field fabrication and assembly.

D. Install and maintain bracing support members in tight contact with each other and with the surface being supported. Do not use wood shims.

E. Coordinate excavation work with installation of bracing. Extend excavation no more than 2 feet below any brace level prior to installation of the bracing.

F. Use procedures that produce uniform loading of bracing member without eccentricities, overstressing, or distortion of system members.

3.8 FIELD QUALITY CONTROL

A. Survey-Work Benchmarks: Resurvey benchmarks regularly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Engineer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.

C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.9 REMOVAL

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder in place.
2. Fill voids immediately with approved backfill compacted to density specified in Section 312000 "Earthwork."
3. Repair or replace, as approved by Engineer, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Do not remove vertical support members that were installed within zone of influence of new or existing structures. Cut off support members installed within this zone at 5 feet below finished grade and abandon in place.

C. Do not remove internal bracing or transfer loads to permanent structure without prior acceptance of the Engineer.

D. Begin removal at excavation bottom and progress upward. Slowly release members noting indication of possible failure of remaining members or possible cave-in of excavation sides.

E. Progress backfilling together with removal of support systems from excavations.

F. Remove all portions of excavation support, unless otherwise indicated by approved Shop Drawings.

1. Zone of Influence Definition: Zone extending down and away from outer edge of the structure at 1 horizontal to 1 vertical.

G. Do not leave untreated wood as part of abandoned portion of the work.

H. When removing excavation support system, do not disturb or damage adjacent buildings, structures, waterproofing material, or utilities. Fill voids immediately with lean concrete or well-graded cohesionless sand or as directed by the Engineer.

I. Immediately remove excavation support system material from site.

END OF SECTION 315000

© 2024 CDM Smith
All Rights Reserved

SECTION 013529 – SAFETY, HEALTH, AND EMERGENCY RESPONSE PLAN REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes the following:

1. Site specific health and safety procedures, including a detailed accident prevention plan are required due to the potentially hazardous conditions at this site. These procedures shall be described in a Safety, Health and Emergency Response Plan (SHERP) prepared by the Contractor. The SHERP shall be submitted to the Engineer and be reviewed by the Engineer and Owner before any Work at the site can be initiated. The Contractor is responsible for the Contractor's workers and subcontractors' health and safety. Implement, maintain and enforce the SHERP procedures at the appropriate time prior to and during all phases of the Work.
2. Utilize the services of a health and safety professional to develop and implement the SHERP. Conduct initial site-specific training and provide support for all health and safety activities as needed, including the upgrading or downgrading of the level of personnel protection.

    a. A Site Safety and Health Officer (SSHO) shall assist in the continued implementation and enforcement of the SHERP. The SSHO shall be assigned to the site and shall be either the Contractor's employee or a subcontractor who reports to the Contractor in matters pertaining to site safety and health.

B. Site Background:

1. No soil or groundwater pre-characterization has been conducted.
2. A search of existing Massachusetts Contingency Plan (MCP) surrounding the site was conducted and there are multiple Regional Tracking Numbers (RTN) assigned to the electrical substation located to the south of the site related to historical mineral dielectric fluid releases, PCB releases, and detections of bis(2-ethylhexylphthalate in groundwater. Response actions for these releases have been completed and have resulted in four class A2 RAOs (RTNs 3-26170, 3-2819, 3-21665, and 3-19646), one class A3 RAO (3-11710), and one class B-1 RAO (3-12481), one RTN is still active and has been assigned a tier 2 classification (3-36845).Related Requirements:

1.3 DEFINITIONS

A. Health and Safety Manager (HSM): The employee assigned to develop the SHERP and assume full responsibility for the health and safety program. The HSM shall meet the qualifications of a Certified Industrial Hygienist as defined below.

B. Site Safety and Health Officer (SSHO): The employee assigned to the site on a full-time basis for the duration of the project with functional responsibility for implementation of the SHERP.

C. Monitoring: Indicates the use of field instrumentation to provide information regarding the levels of organic vapors which are being released during remedial action. Monitoring shall be conducted to evaluate employee exposures to toxic materials.

D. Physician: A licensed physician with experience in the practice of occupational medicine.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data:

1. Designate an individual as the Health and Safety Manager (HSM). HSM shall be a Certified Industrial Hygienist (CIH) or a Certified Safety Professional (CSP) and shall develop and implement the SHERP. The qualified individual shall be the Contractor's internal review and acceptance authority for the SHERP.
2. Designate an individual as the Site Safety and Health Officer (SSHO) who shall assist and represent the HSM in the continuous implementation and enforcement of the SHERP. The SSHO shall be assigned to the site on a full-time basis and shall report to the Contractor and the HSM in matters pertaining to site safety and health. The SSHO shall be responsible for preparing and maintaining daily SHERP site logs and reports.
3. Submit the qualifications of the SSHO in accordance with Section 013300 "Submittal Procedures", and within 7 days of usance of Notice to Proceed and prior to the development of the SHERP. The qualifications include:

    a. A minimum of 2 years working experience in prior health and safety roles during remediation or construction.
    b. A working knowledge of Federal, State, and local safety and health regulations.
    c. Specialized training in personal and respiratory protective equipment program implementation and in the proper use of air monitoring instruments and air sampling methods and procedures.
    d. Current certification in first aid and cardiopulmonary resuscitation (CPR) by a recognized approved organization such as the American Red Cross.
    e. In addition to 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste training, 8-hour OSHA Refresher training, and participation in a qualified medical surveillance program, the SSHO shall also be, 8-hour OSHA Supervisory Trained, and OSHA 30-hour Construction Safety trained within the last five years.
    f. Has the authority and knowledge necessary to implement the site-specific SHERP and verify compliance with applicable safety and health requirements.

B. Training Certificates:

1. Submit SSHO training certificates that verify 40-hour OSHA HAZWOPER training, 30-hour OSHA Construction, 8-hour OSHA Supervisory Training, current 8-hour OSHA Refresher training, and current medical monitoring.
2. Submit documentation of successful completion of a 10-hour course on construction safety approved by OSHA for all other employees to be employed at the worksite (including subcontractors).
3. Provide names and documentation of training for all individuals designated as OSHA Competent Persons.

C. Submit the Safety, Health and Emergency Response Plan (SHERP).

1.5 REGULATORY REQUIREMENTS AND APPLICABLE PUBLICATIONS

A. Site specific health and safety procedures, including a detailed accident prevention plan are required. These procedures shall be described in a Safety, Health and Emergency Response Plan (SHERP) prepared by the Contractor. The SHERP shall be submitted to the Engineer and be reviewed by the Engineer and Owner before any Work at the site can be initiated. The Contractor is responsible for the Contractor's workers and subcontractors health and safety. Implement, maintain, and enforce the SHERP procedures at the appropriate time prior to and during all phases of the Work.

B. Provide a specific SHERP consistent with the requirements of the following:

1. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926.
2. United States Environmental Protection Agency (USEPA) Standards and Regulations contained in Title 40 Parts.

C. Provide a SHERP that contains, at a minimum, the following components:

1. Site Description and Evaluation.
2. Names of key personnel and alternates responsible for site safety and health (responsibilities and chain of command).
3. Safety and health hazard assessment and risk analysis for each site task and operation (Accident Prevention Plan).
4. Education and Training.
5. Personnel Protective Equipment.
6. Medical Surveillance.
7. Air Monitoring.
8. Standard Operating Procedures, Engineering Controls and Work Practices.
9. Site Control Measures (Work Zones, Communications and Security including sign-in and sign-out procedures).
10. Personnel Hygiene and Decontamination.
11. Equipment Decontamination.
12. Emergency Equipment and First Aid Requirements.
13. Pre-Emergency Planning, Emergency Response Plan and Contingency Procedures.
14. Emergency recognition and prevention.
15. Safe distances and places of refuge.
16. Site security and control.

17. Evacuation routes and procedures.
18. Emergency medical treatment, first aid, and hospital route.
19. Personnel roles, lines of authority, training and communication.
20. Heat/Cold Stress Monitoring.
21. Logs, Reports and Record Keeping.
22. Copies of Safety Data Sheets for all chemicals to be used.
23. Any additional employee training that is required for this project.
24. Biological Hazards.
25. Lockout Tagout Procedures.
26. Fall Protection.
27. Excavation safety.
28. Crane and manlift use (if applicable).

D. A copy of the site specific SHERP shall be submitted to the Engineer within 7 days following the Effective Date of the Agreement and must be approved prior to commencement of any on-site work.

E. Determination of the appropriate level of worker safety equipment and procedures shall be made by the Contractor as a result of initial site survey review of existing data and a continued safety and health monitoring program performed by the SSHO and approved by the Engineer, in accordance with the requirements specified herein. Existing data indicate that all work can be performed in Level D with contingency procedures to move to Level C protection.

F. Standards delineated in this Section are in addition to or an amplification of procedures and requirements of the above referenced regulations and documents.

G. Should any unforeseen or site-specific safety related factor, hazard, or condition become evident during the performance of work at this site, it shall be the Contractor's responsibility to bring such to the attention of the Engineer both verbally and in writing as quickly as possible, for resolution. In the interim, the Contractor shall take prudent action to establish and maintain safe working conditions and to safeguard employees, the public and the environment.

H. Should the Contractor seek relief from, or substitution for, any portion or provision of the SHERP, such relief or substitution shall be requested of the Engineer in writing and if approved, be authorized in writing.

I. The SHERP developed by the Contractor shall include provisions for work related to initial site preparation prior to implementation of the facilities described in this Contract. It shall be the responsibility of the Contractor to conduct whatever testing and monitoring is deemed necessary to assure a safe operation during the initial site preparation work.

1.6 SITE CONTROL

A. Communications

1. Ensure access to portable telephone communication at the site to reach emergency numbers, including police, fire, ambulance, hospital and Owner, shall be prominently posted.

B. Security

1. Unauthorized access to these areas shall be restricted. Specific components of this security operation are as follows:

    a. Vehicular access to all fenced areas shall be restricted to authorized vehicles only.
    b. Maintain a log of security incidents.
    c. Require visitors having access to all fenced areas to sign-in and sign-out and shall keep a record of all site access.
    d. All approved visitors shall be briefed on safety and security and escorted by the Contractor SSHO throughout their visit.

1.7 TRAINING

A. Develop a training program to inform employees, Subcontractors, supplier's representatives, and official visitors to the project site of the special hazards and procedures (including PPE, its use and inspection) to control these hazards during field operations. This program shall be consistent with the requirements of 29 CFR 1926.65. "Official visitors" include but are not limited to Federal Agency Representatives, State Agency Representatives, Municipal Agency Representatives, subcontractors, etc.

B. Certify that all personnel assigned to or regularly entering the site for the purpose of performing or supervising work, for health, safety, security, or administrative purposes, for maintenance, or for any other site-related function, have received appropriate safety training in accordance with the SHERP. Documentation of all such training shall be submitted to the Engineer before any employees will be allowed to perform work at the site.

1.8 MEDICAL SURVEILLANCE

A. If the SHERP identifies the need for a medical surveillance program, the Contractor shall provide the physician with site-specific information and the physician must provide the Contractor with a written medical opinion.

1. Additional clinical tests may be included at the discretion of the attending physician performing the physical examination.
2. Periodic surveillance examinations shall be performed:

    a. At the discretion of the attending physician performing the physical examination.

3. In addition, a non-scheduled medical examination shall be conducted under the following circumstances:

    a. After acute exposure to any toxic or hazardous material.
    b. At the discretion of the Contractor's HSM/SSHO or consulting physician, when an employee has been exposed to dangerous levels of toxic or hazardous materials.

4. Maintain all medical surveillance records in accordance applicable OSHA requirements and make these records available to the Engineer or other regulatory agencies as required.
5. These records shall be maintained for a period of 30 years. One copy of all records shall be turned over to the Owner as specified in Section 017839 “Project Record Documents.”

1.9 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. Develop contingency plans including evacuation procedures and routes to places of refuge or safe distances from the danger area, for the following potential emergencies: chemical exposure, personal injury, potential or actual fire or explosion, environmental accident (spill or release) and discovery of radioactive material. In the event of any emergency associated with remedial action, without delay: take diligent action to remove or otherwise minimize the cause of the emergency; alert the Engineer and institute whatever measures might be necessary to prevent any repetition of the conditions or actions leading to, or resulting in, the emergency.

B. Emergency medical care services shall be prearranged at a nearby medical facility with established emergency routes. The staff at the facility shall be advised of the potential medical emergencies that might result.

C. Establish emergency communications with health and emergency services. The name of this facility, name of contact, emergency routes and emergency communications arrangements shall be provided in the SHERP. In addition, the Contractor shall provide the following equipment:

1. At least one first aid kit shall be provided and maintained fully stocked at a first aid station which is in close proximity to the work, but not inside a hazardous work area. First aid kit locations shall be specially marked and provided with adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions.
2. Have at least one certified First Aid Technician on the site at any time there is work being performed. This person may perform other duties but must be immediately available to render first aid when needed. Certification shall be by the American Red Cross or other approved agency and shall be submitted to the Engineer.
3. 2A-10 B:C type dry chemical fire extinguishers shall be provided at the site office.

1.10 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

A. Develop an emergency response and contingency plan for on-site and off-site emergencies, as specified in OSHA 29 CFR 1910.120(l), which shall address at a minimum:

1. Pre-emergency planning.
2. Personnel roles, lines of authority, training and communication.
3. Emergency recognition and prevention.
4. Safe distances and places of refuge.
5. Site security and control.
6. Evacuation routes and procedures.
7. Decontamination.
8. Emergency medical treatment and first aid.
9. Emergency alerting and response procedures.
10. Critique of response and follow-up.
11. Personal Protection Equipment (PPE) and emergency equipment.

B. In the event of any emergency associated with Response Action, without delay: take diligent action to remove or otherwise minimize the cause of the emergency; alert the Engineer and institute whatever measures might be necessary to prevent any repetition of the conditions or actions leading to, or resulting in, the emergency.

C. Emergency medical care services shall be prearranged at a nearby medical facility with established emergency routes. The staff at the facility shall be advised of the potential medical emergencies that might result and that the patients clothing and skin might be contaminated.

D. Establish emergency communications with health and emergency services. The name of this facility, name of contact, emergency routes and emergency communications arrangements shall be posted at the site. The posted list shall include the following minimum points:

1. Contractor physician name, address and telephone number.
2. Ambulance service and fire department telephone numbers.
3. Procedure for prompt notification of Engineer and DER.

E. In the event that an accident for some other safety related incident occurs during the course of the project, the Engineer shall be telephoned immediately and receive a written notification within 24 hours. The report shall include the following items:

1. Name, organization, telephone number, and location of the Contractor.
2. Name and title of the person(s) reporting.
3. Date and time of accident/incident.
4. Location of accident/incident, including site location and facility name.
5. Brief summary of accident/incident giving pertinent details including type of operation ongoing at time of accident.
6. Cause of accident/incident, if known.
7. Casualties (fatalities, disabling injuries).
8. Details of any existing chemical hazard or contamination.
9. Estimated property damage, if applicable.
10. Nature of damage; effect on contract schedule.
11. Action taken by Contractor to ensure safety and security.
12. Other damage or injuries sustained (public or private).

1.11 PERSONAL PROTECTIVE EQUIPMENT

A. Provide all on-site personnel with appropriate personal safety equipment and protective clothing, and ensure that all safety equipment and protective clothing is kept clean and well maintained. The Contractor's HSM shall establish upgrade/downgrade "action levels" from the specified minimum levels of protection based upon air monitoring results and direct contact potential. Protocols formally changing the level of protection and the communication network for doing so shall be described in the SHERP. Any changes to the minimum level of protection shall be approved by the SSHO and the Engineer.

1. All prescription eyeglasses in use on the site shall be safety glasses.
2. Footwear used on site shall be steel-toed, steel shank safety shoes or boots, with chemical resistant soles.
3. All on-site personnel shall wear a hard hat when engaging in construction or drilling activities.

1.12 PERSONAL HYGIENE AND DECONTAMINATION

A. Provide and require use by personnel of:

1. Hand washing facilities.
2. A designated lunch and/or break area.
3. A smoking area.

B. Disposable outerwear shall not be reused, and when removed, shall be placed inside disposal containers provided for this purpose located in the Contamination Reduction Zone.

C. Smoking and chewing shall be prohibited except in a designated Contractor provided smoking area.

D. Eating and drinking shall be prohibited except in a designated Contractor provided lunch or break area.

E. Contractor personnel shall be required to thoroughly cleanse their hands and other exposed areas before entering the smoking or lunch area.

1.13 AIR MONITORING

A. General Requirements:

1. The Contractor's HSM shall design, develop, and implement an Air Monitoring Program as necessary based on the hazards identified in the SHERP.
2. Information gathered during the air monitoring program shall be used to determine appropriate safety and personnel protective measures to be implemented during construction.

B. General Responsibilitie
1. Establish and document baseline (background) air quality conditions prior to commencement of work, for conducting air monitoring during onsite work, and for documenting air quality conditions after completion of site remediation work.
2. All air monitoring equipment required shall be provided by the Contractor and shall be maintained and calibrated according to EPA and NIOSH analytical methods and/or manufacturers' recommendations. Such maintenance and calibration data shall be recorded.
3. All air monitoring equipment shall be operated by personnel trained in their specific use (i.e., SSHO).

C. Action levels developed for the exclusion zone, for the upgrade or downgrade of worker personal protective equipment, shall be based upon information published by the American Conference of Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA), and the United States Environmental Protection Agency (USEPA). Action levels shall be based upon established Permissible OSHA Exposure Limit and ACGIH Threshold Limit Values. Action levels shall be established for each work activity and contaminant present. Provide a table for each activity listing the contaminant(s) to be measured, measuring instrument, frequency of measurement, duration of measurement, action level, and required action.

D. Action levels developed for the exclusion zone perimeter, for the implementation of dust suppression measures and other engineering control measures to protect non-40-hour health and safety trained construction workers, the Engineer, and the Owner from the release of airborne contaminants, shall be based upon information published by the American Conference of

Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA), and the United States Environmental Protection Agency (USEPA). Action levels shall be based upon established Permissible OSHA Exposure Limit and ACGIH Threshold Limit Values. Action levels shall be established for each work activity and contaminant present. Provide a table for each activity listing the contaminant(s) to be measured, measuring instrument, frequency of measurement, duration of measurement, action level and required action.

1. Provide the support necessary for air monitoring during the program, for the interpretation of the analytical results and for the recording and documentation of the results.

1.14 EQUIPMENT DECONTAMINATION

A. The procedures for decontamination of vehicles and equipment shall be outlined in the SHERP. Monitoring all vehicle decontamination prior to exiting the site.

B. The following EPA Standard Operating Procedures (SOP), as amended, for field application shall be used to wash or decontaminate all equipment that comes in contact with contaminated ground water.

1. Cleaning Procedures for Stainless Steel or Metal Sampling Equipment Used for the Collection of Samples for Trace Organic Compounds and/or Metals Analyses, subsection B-4, Appendix B, Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. Environmental Protection Agency, Region IV, Environmental Services Division, Athens, Georgia, April 1, 1986.

C. All water used for decontamination, shall be uncontaminated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

3.1 SHERP IMPLEMENTATION

A. Implement and maintain the SHERP throughout the performance of work within the project limits, as indicated in the Contract Documents or by the SHERP. In work locations and areas identified as having a potential risk to worker health and safety and any other areas deemed appropriate by the SSHO, the Contractor shall be prepared to immediately implement the appropriate health and safety measures, including but not limited to the use of PPE, and engineering and administrative control.

B. Should any unforeseen hazard become evident during the performance of the work, the SSHO shall immediately bring such hazard to the attention of the Contractor, HSM, Engineer and the Owner. In the interim, the Contractor shall take action, including Stop Work Orders and/or upgrading PPE as necessary to re-establish and maintain safe working conditions and to

safeguard on-site personnel, visitors, the public and the environment. The SHERP shall then be revised/amended to reflect the changed condition.

C. The SHERP shall be maintained on-site by the Contractor and shall be kept current with abatement, excavation, demolition, material handling, and construction activities and general site conditions under this Contract. The SHERP shall be recognized as a flexible document which shall be subject to revisions and amendments, as required, in response to actual site conditions, changes in work methods and/or alterations in the relative risk present. All changes and modifications shall be signed by the Contractor's HSM and shall require the review and acceptance by the Owner or Engineer prior to implementation of such changes.

D. The Contractor shall be responsible for the health and safety of his employees and subcontractors during the progress of the work.

E. If the Engineer observes deficiencies in the Contractor's operations with respect to the SHERP, they shall be assembled in a written directive and given to the Contractor. The Contractor shall immediately correct the deficiencies and respond, in writing, as to how each was corrected. Failure to bring the work area(s) and implementation procedures into compliance may result in a Stop Work Order and a written directive to discuss an appropriate resolution(s) to the matter. When the Contractor demonstrates compliance, the Engineer shall remove the Stop Work Order. If a Stop Work Order has been issued for cause, no delay claims on the part of the Contractor will be honored.

END OF SECTION 013529

© 2024 CDM Smith
All Rights Reserved

SECTION 026110 - EXCAVATION AND MANAGEMENT OF EXCESS SOILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section is provided for the management of soil generated during construction. Within the project work area described in Paragraph 1.2 (B) below, furnish all labor, materials, tools, equipment necessary for screening, tracking, stockpiling, and management of excavated soil.

B. No sampling has been conducted to date. A search of existing Massachusetts Contingency Plan (MCP) surrounding the site was conducted and there are multiple Release Tracking Numbers (RTNs) assigned to the electrical substation located to the south of the site related to historical mineral dielectric fluid releases, PCB releases, and detections of bis(2-ethylhexylphthalate in groundwater. Response actions for these releases have been completed and have resulted in four class A2 RAOs (RTNs 3-26170, 3-02819, 3-21665, and 3-19646), one class A3 RAO (3-11710), and one class B-1 RAO (3-12481), one RTN is still active and has been assigned a tier 2 classification (3-36845).

C. Furnish all labor, materials, tools, and equipment necessary for screening, tracking, and stockpiling of excavated soil, and sampling of soil if determined to be surplus. Utilize the services of an Environmental Professional (EP) to perform the work of this Section. If determined necessary due to a Reportable Condition under the MCP, utilize the services of a Licensed Site Professional (LSP) for preparation of applicable documentation and oversight of Contractor’s work in compliance with the MCP.

D. Section Includes:

1. Excavating, screening, tracking, stockpiling, stockpile sampling, and managing of excavated soil.
2. Provide Delegated Design services of an Environmental Professional (EP) or remediation specialist.

E. Related Requirements:

1. Section 013529 “Health, Safety and Emergency Response Procedures.”
2. Section 028100 “Transportation and Disposal of Excess Material.”

1.3 DEFINITIONS

A. Contaminated Groundwater: Groundwater with contaminant concentrations above MCP reportable concentrations standards, RCGW-1.

B. Contaminated Soil: Excavated soil with visual or olfactory evidence of environmental impact, or with headspace readings greater than or equal to 10 ppm or with contaminant concentrations above MCP reportable concentration standards, RCS-1.

C. EP: Environmental Professional – Someone who is certified by the State or specializes in soil remediation to conduct site investigations and/or remedial actions at hazardous waste sites.

D. EPA: United States Environmental Protection Agency.

E. NPDES: National Pollutant Discharge Elimination System.

F. Site-Related Contaminants of Concern: Contaminants identified in the existing hazardous material information that exceed permissible regulatory cleanup standards.

G. Suitable Soil: Excavated soil that is uncontaminated and physically suitable for use as backfill material.

H. Excess Soil: Excavated soil that will not be re-used on-site for this project.

I. Uncontaminated Soil: Excavated soil that is not visually and/or does not contain site-related contaminants of concern.

J. Unsuitable Soil: Excavated soil that is physically unsuitable for use as backfill material.

K. Uncontaminated Groundwater: Groundwater that does not contain site-related contaminants of concern.

L. United States Environmental Protection Agency (EPA).

M. National Pollutant Discharge Elimination System (NPDES).

N. Massachusetts Department of Environmental Protection (MDEP).

O. Massachusetts Contingency Plan (MCP).

1. MCP reporting category defined in 310 CMR 40.0361(1)(b) - (RCS-1).
2. MCP reporting category defined in 310 CMR 40.0362(1)(b) - (RCGW-1).

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review geotechnical data.
2. Review existing utilities and subsurface conditions.
3. Review coordination for interruption, shutoff, capping, and continuation of utility services.

4. Review proposed excavations.
5. Review proposed equipment.
6. Review monitoring of excavation support and protection system.
7. Review coordination with waterproofing.
8. Review abandonment or removal of excavation support and protection system

1.5 ACTION SUBMITTALS

A. Regulatory Requirements.

1. United States Department of Environmental Protection (EPA).

a. Federal Hazardous Waste Regulations, 40 CFR Parts 261-268.

2. Massachusetts Department of Environmental Protection (MDEP).

a. Massachusetts Contingency Plan, 310 CMR 40.0000.
b. Massachusetts Hazardous Waste Regulations, 310 CMR 30.000.
c. Interim Remediation Waste Management Policy for Contaminated Soils, Policy # WSC-94-001.
d. Reuse and Disposal of Contaminated Soils at Massachusetts Landfills, Policy # COMM-97-001.

B. Soil Management Plan (SMP) – Submit a work plan providing details of soil excavation, tracking, stockpiling, reuse of soil on-site, and/or off-site disposal. The work plan shall detail the handling, potential reuse, and disposal of the soil within the proposed scope of work limits including proposed transporters, facilities' contact information, sampling requirements, and acceptance criteria. Pre-characterization sampling has not been conducted, complete soil sampling as necessary to meet the requirements of off-site soil disposal facilities.

C. Laboratory shall be approved by the Commonwealth of Massachusetts. Preservation of samples for analysis shall be consistent with the laboratory requirements.

D. Shop Drawings:

1. The Engineer will be responsible for preparing all MCP filings, if required including but not limited to:

a. Release Notification Form (RNF),
b. Release Abatement Measure (RAM) Plan,
c. RAM Completion Report,
d. Response Action Outcome (RAO) Statement.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: The Environmental Professional (EP) shall have the following minimum qualifications:

1. A minimum of five years of demonstrated experience on contaminated site projects.

2. A minimum of 3 assignments where similar soil screening program has been undertaken.
3. A.S. or B.S. degree in engineering, engineering technology or science.
4. Registration as a P.E. (Professional Engineer), LSP (Licensed Site Professional), QEP (Qualified Environmental Professional) or CHMM (Certified Hazardous Materials Manager).
   40-hour OSHA (Occupational Safety and Health Administration) health and safety training, 8-hour OSHA supervisory training, current 8-hour OSHA refresher training and current medical monitoring.

B. Product Certificates: For each type of material

1. High density polyethylene (HDPE) liner.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: All laboratory results including the data validation reports.

B. Operation and Maintenance Data: For the groundwater treatment system to include in operational records, operation, and maintenance manuals.

1.8 PRECONSTRUCTION TESTING

A. No pre-characterization analytical samples have been collected.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing MassDEP and/or EPA notification regulations before beginning work. Comply with hauling and disposal regulations of authorities having jurisdiction.

2.2 HIGH DENSITY POLYETHYLENE (HDPE) LINING

A. The high-density polyethylene shall be manufactured of new, first-quality product designed and manufactured specifically for the intended use and have the following properties:

1. The material shall be 3-ply polyethylene reinforced with a non-woven grid of high strength nylon cord.
2. The material shall be U.V. resistant (black in color) and cold crack resistant to minus 40 degrees F.
3. The material shall be manufactured in a minimum 12-ft seamless width. Labels on the rolls shall identify the thickness, length, width, and manufacturer's mark number.

© 2024 CDM Smith
All Rights Reserved

PART 3 - EXECUTION

3.1 HEALTH AND SAFETY APPLICABILITY

A. As a minimum, the requirements of Section 013529 “Health, Safety and Emergency Response Procedures”, shall apply to all Work involving Contaminated Soil and or Contaminated Groundwater.

B. At the direction of the Engineer, decontaminate grossly contaminated equipment by means of dry methods such as brooms and absorbent towels.

C. Provide workers with personal protective equipment as necessary to comply with the Health and Safety Plan.

3.2 EXCAVATED SOIL MANAGEMENT

A. Stockpile excess soil on HDPE lining and collect samples to comply with disposal facility requirements. Stockpiles designated to the same disposal category may be combined but stockpiles designated for separate disposal categories shall remain segregated. The Contractor is responsible for all sampling required for the approval of soil disposal or reuse at an off-site facility.

B. Contractor is responsible for the development and implementation of their approved Soil Management Plan (SMP) for handling of both contaminated and uncontaminated material. Manage excavated soil in accordance with the SMP, SHERP and all other procedures in the Contract documents. Contractor is responsible for all soil management costs (stockpiling, transportation, and disposal), including laboratory analysis required by the disposal facilities.

C. Temporarily stockpile excavated soil on site in stockpiles in accordance with Article 3.4 and not exceeding the volumes specified in Article 3.5, as applicable, pending re-use in the project area or off-site disposal. All excavated soil shall be stockpiled and handled in accordance with the most recent version of MassDEP guidance policies. Contractor shall not co-mingle soil from different Soil Disposal Categories and assign each stockpile a unique identifier.

D. All excavated soil requires proper handling and management, until it has been identified for reuse in the project area or for off-site disposal.

E. Work and decontamination procedures in areas containing contaminated material shall be performed in accordance with standard industry practices including use of decontamination facilities, barriers, liners, and other means to control cross-contamination.

F. Employ methods necessary to isolate contaminated soils from uncontaminated soils, including benching.

G. Reuse uncontaminated soil in the project area as much as possible if determined to be physically suitable in accordance with Section 312000 “Earthwork.” Contaminated soil may be permissible for reuse in the project area, upon review and agreement by the LSP of Record. Any reuse of contaminated soil requires compliance with a Release Abatement Measure (RAM) Plan and applicable regulations.

3.3 SOIL SCREENING

A. Soil screening shall be performed at the point of excavation.

B. Jar headspace testing shall be performed as follows:

1. Half-fill two clean 500 ml glass jars with the sample to be analyzed. Quickly cover each open top with one sheet of clean aluminum foil and screw on jar lid tightly.
2. Allow the samples to sit for at least 10 minutes. Vigorously shake jars for 15 seconds both at the beginning and end of the waiting period. Store samples inside a heated vehicle or building if temperature is below 32 degrees F.
3. Remove jar lid exposing aluminum foil seal. Quickly puncture foil seal with a photoionization detector (PID) to a point one-half of the "headspace" depth. Record PID reading within 2 to 5 seconds.
4. Calibrate and operate PID instruments to yield "total organic vapors" in ppm (v/v) as benzene with a 10.0 +/- eV lamp source.

C. Visual evidence shall include obvious staining, discoloration or other irregularity.

D. Olfactory evidence shall include petroleum, gasoline, hydrogen sulfide ("rotten egg") or any other chemical odor.

E. Perform soil screening at a frequency of one sample per 10-wheel dump truck load. Soil screening includes visual and olfactory observations and jar headspace testing.

F. Utilize screening form included at the end of this Section or develop similar one.

3.4 STOCKPILE MANAGEMENT

A. All excavated soil requires proper handling, stockpiling, and management, until it has been reused in the project area or taken for off-site disposal. Stockpiles shall be securely barricaded and clearly labeled. Hay bales shall be placed around the stockpiles.

1. Excavated materials shall be placed on a base lined with 20 mil (or higher gauge) HDPE and be completely and securely covered with 10 mil (or higher gauge) HDPE.
2. The HPDE shall be bermed around the edges to prevent any infiltration of stormwater or exfiltration of leachate. Place hay bales or other berm material in a manner that prevents sediment and soil from spilling out of the stockpile. The berm height shall be a minimum of 12 in.
3. Contractor will not co-mingle soil from different Soil Disposal Categories.
4. Assign each stockpile a unique identifier.
5. Track stockpiles to provide complete data necessary to locate any stockpile within the site. All Work necessary to coordinate stockpiling from placement to disposal shall be included. Provide Engineer with duplicate copies of all documentation at the time of stockpiling. The stockpiled soil must be removed from the site in accordance with applicable regulatory deadlines or no later than the completion date of this Contract, whichever is less.
6. Stockpiled material must be covered securely (from rain and wind disturbances) with a top liner (cover) at the end of each workday.

7. Top liner and stockpiled material must be configured in a manner to prevent pooling of rainwater.
8. The location of the hay bales or other berm material will be adjusted based on the volume of stockpiled material to prevent sagging of the top liner and to promote drainage off of the top liner.
9. The HDPE cover shall be adequately secured using a network of sandbags secured to one another by rope or approved equal to prevent damage or loss by wind or other weather elements.
10. Contractor shall inspect stockpiles on a daily basis, and maintain the stockpiles including berms, top liner, and bottom liner, throughout construction activities.

3.5 SOIL TRACKING, STOCKPILING AND TESTING

A. Pre-characterization analytical sampling has not been completed. Collect analytical soil samples from soil stockpiles to meet requirements of offsite disposal facilities. Each soil designation shall be stockpiled separately, and each soil stockpile shall be given a unique identifier. Record excess soil movement including excavation location, quantities, and final disposition on a tracking form for the duration of the project. Manage stockpiles in accordance with Article 3.4.

B. Suitable and unsuitable soil shall be kept separate.

C. Stockpile contaminated soil to meet the disposal facility requirements, in stockpiles not exceeding a volume of 500 cubic yards. Contaminated soil shall be segregated and stockpiled separately from uncontaminated and uncharacterized soil. Multiple categories have been identified for disposal of soil, therefore each separate soil category (i.e., out of state, in-state lined landfill, in-state unlined landfill) shall be segregated separately and properly labeled to prevent comingling of soil. Contaminated Soil shall be placed on a base lined with 20 mil HDPE lining and be completely covered with 10 mil. HDPE lining. The HDPE cover shall be adequately secured using a network of sandbags secured to one another by rope or approved equal to prevent damage or loss by wind or other weather elements. The base liner shall be bermed around the edges to prevent infiltration of stormwater or exfiltration of leachate. The berm height shall be a minimum of 12-in. Stockpiles shall be securely barricaded and clearly labeled. Hay bales shall be placed around the stockpiles.

D. After proposed soil disposal facilities have been submitted to the Engineer for approval and the acceptance criteria for each facility have been established, Contractor shall be responsible for the collection of samples required for characterization based on the requirements of the disposal facility(s) identified by the Contractor. The Contractor will be responsible for identifying a backup facility for material that does not meet the requirements of the identified facility.

E. Identify appropriate disposal facilities, provide waste profiles and acceptance criteria to the Engineer, and secure approvals from the disposal facilities for soil disposal. Contractor shall be responsible for preparing the waste profiles and shipping documents in accordance with Section 028100 “Transportation and Disposal of Excess Material” and providing to Engineer for review, approval, and signature as LSP-of-Record.

F. Reuse uncontaminated suitable soil in accordance with this Section and Section 32000 “Earthwork.”

G. Dispose of excess and unsuitable soil in accordance with Section 028100 “Transportation and Disposal of Excess Material.”

3.6 DISPOSAL FACILITY TESTING

A. The Contractor shall be responsible for characterizing the soil (and groundwater, if required) for the purpose of obtaining approvals for final disposal of contaminated and surplus soil. The Contractor shall collect soil samples to perform testing required by the disposal facility and the requirements of Section 028100 “Transportation and Disposal of Excess Material.”

B. Soil disposal shall be conducted in accordance with Section 028100 “Transportation and Disposal of Excess Material.”

3.7 POST EXCAVATION SAMPLING AND ANALYSIS

A. If required, the Engineer will collect discrete soil samples to verify removal of contaminated soils or soils at the boundary of different Soil Disposal Categories. Provide access to the Engineer for sampling the base and sidewalls of excavations. Excavations must be left open until the Engineer evaluates laboratory data.

END OF SECTION 026110

© 2024 CDM Smith
All Rights Reserved

SECTION 028100 - TRANSPORTATION AND DISPOSAL OF EXCESS MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section is provided for the management of excess and contaminated soil generated during construction that requires off-site disposal. No pre-characterization analytical soil samples have been collected. Both uncontaminated and contaminated soils may be encountered, and all soil will require proper handling and management.

B. Furnish all labor, material, tools and equipment necessary for the transportation and disposal of excess material generated from activities specified in Section 026110 “Excavation and Management of Soil.”

C. Section includes: Requirements for all labor, material, tools and equipment necessary for the transportation and disposal of contaminated materials generated from activities specified in Section 026110 “Excavation and Management of Excess Material.”

D. The Contractor shall be responsible for determining the appropriate disposal location based on sampling results. Disposal determination will be subject to the Engineer's approval.

E. The Owner will be the generator and will sign all waste profiles, bills of lading and hazardous waste manifests. Owner information is as follows:

1. Owner's Name: Anthony Blazejowski, City of Woburn
2. Owner’s Title: Water Treatment Plant Manager
3. Owner’s Address: Water Treatment Plant Manager
4. Owner's Telephone Number: (781) 897-5945
5. Owner's E-Mail Address: ablazejowski@cityofwoburn.com
6. Project Name: Horn Pond Water Treatment PFAS Upgrade
7. Site Address: 5 Cove Street, Woburn, MA 01801
8. Generator's EPA Identification Number:

F. For contaminated soil disposal, where more than one disposal option exists, the Contractor shall select the least costly disposal option.

G. Related Requirements:

1. Section 312319 “Dewatering.”
2. Contaminated Soil Excavation is included in Section 026110 “Excavation and Management of Excess Material.”

3. Health and Safety Plan Requirements are included in Section 013529 "Health, Safety and Emergency Response Procedures."

1.3 DEFINITIONS

A. Less than RCS-1 Facility (< RCS-1 Facility) – This type of facility is approved to accept soil that has concentrations less than the RCS-1 criteria. These facilities have their own acceptance criteria which may be more stringent than the RCS-1 criteria for certain chemical constituents and may require soils to be less than the Limiting Soil Concentrations found in Table 2 of MassDEP Guidance WSC#-13-500, Similar Soils Provision Guidance. Contractor shall review applicability of a less than RCS-1 facility based on an individual facility(s) acceptance criteria. In addition, most less than RCS-1 facilities have requirements regarding headspace readings and visual/olfactory contamination. Designate an in-state unlined landfill as a backup for all less than RCS-1 material in case a portion of the material is unacceptable at the less than RCS-1 facilities.

B. In-State Landfill - This type of landfill shall be approved by the Commonwealth of Massachusetts to accept soil for reuse with concentration levels below the Department of Environmental Protection Policy # COMM-97-001 criteria listed below:

FACILITY MAXIMUM CONTAMINANT LEVELS		
Contaminant	Lined Landfill Reuse Levels (mg/kg)	Unlined Landfill Reuse Levels (mg/kg)
Total Arsenic	40	40
Total Cadmium	80	30
Total Chromium	1,000	1,000
Total Lead	2,000	1,000
Total Mercury	10	10
Total Petroleum Hydrocarbons	5,000	2,500
Total PCBs	<2	<2
Total SVOCs	100	100
Total VOCs	10	4
Listed or Characteristic Hazardous Waste (TCLP)	None	None

C. In-State Recycling Facility - This type of facility shall be approved by the Commonwealth of Massachusetts to accept soil for reuse Listed Waste Material – Soil that indicates the presence of any of F-code wastes set forth in 40 CFR 261.31 or U-code wastes set forth in 40 CFR 261.33.

D. Out-of-State Landfill - This type of landfill shall be state approved or permitted to accept soil that is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261or PCB waste as defined in 40 CFR 761. This type of landfill shall accept soil for disposal and reuse purposes.

E. Out-of-State Recycling Facility - This type of facility shall be state approved or permitted to accept soil that is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261or PCB waste as defined in 40 CFR 761.

F. RCRA Landfill – This type of landfill shall be state and federally approved to accept soil that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR261.

G. RCRA TSD Facility – This type of facility shall be state and federally approved to accept soil that is classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR 261.

H. Surplus Soil - Excavated soil that is not usable for project backfill or reuse. If excavated soil has been stockpiled for use as backfill, but there are no excavations left to be backfilled, the remaining stockpile could be surplus. This includes (but is not limited to) topsoil, soil excavated during utility installation, building construction, and soil from site grading. Includes excavated soil that cannot be re-used due to physical or chemical characteristics of the material or project restrictions.

I. TCLP Material – Soil, through TCLP analysis, that exceeds the regulatory limit established for any one or more RCRA metals set forth in Table 1 of 40 CFR 261.24.

J. Listed Waste Material – Soil, through VOC analysis, that indicates the presence of any of F-code wastes set forth in 40 CFR 261.31 or U-code wastes set forth in 40 CFR 261.33.

K. Disposal Facility – In-state Landfill, In-State Recycling Facility, Out-of-State Landfill, Out-of-State Recycling Facility, RCRA Landfill or RCRA TSD Facility.

L. TSD – Treatment, storage and disposal.

M. Underlying Hazardous Constituent (UHC) – As defined in 40 CFR 268.2, "Any constituent listed in 40 CFR 268.48, Table UTS – Universal Treatment Standards, except fluoride, selenium, sulfides, vanadium and zinc which can be reasonably expected to be present at the point of generations of the hazardous waste, at a concentration above the constituent-specific UTS treatment standard." For this project, metals and PAHs are the UHCs, "reasonably expected" to be present above applicable UTS.

N. Universal Treatment Standard (UTS) – Numerical standards set forth in 40 CFR 268.48, Table UTS – Universal Treatment Standards. Non-wastewater and wastewater treatment standard levels that are used to regulate most prohibited hazardous wastes. Applicable UTS for soils are defined in 40 CFR 268.49(c).

O. OHM – Oil and Hazardous Materials

1.4 ACTION SUBMITTALS

A. Submit, in accordance with Section 013300 “Submittal Procedures”, all pertinent information relating to the transport and disposal of materials specified herein. The information submitted shall include the following:

1. Transporter Information:

a. Name and address of common carrier transporters to be used on project.
b. Name and address of licensed transporters to be used on project. Provide current licenses and permits to operate in all states affected by transport. Provide current EPA transporter license.

2. Facility Information

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 provide written confirmation that they are permitted to accept and will accept material of the general quality and quantity described by these Specifications.
c. 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 management of materials specified in this Contract.
d. Submit a complete list of the disposal facility's permitted allowable contaminant levels and physical characteristic requirements for contaminated material, and list any required regulatory approvals for individual waste streams.

B. Prepare and submit to the Engineer for approval all waste profiles, specialists’ opinion letters, and coordinate with disposal facilities.

C. Provide the Engineer with originals of all hazardous waste manifests, non-hazardous waste manifests and bills of lading, and material shipping records, no less than 7 days in advance of shipping OHM off site.

D. Prepare bill of lading forms and material shipping records. Submit these to the Engineer for approval at least 7 days before transport. Engineer will sign as LSP on bill of lading and LSP opinion letter and will be responsible for obtaining Owner's signature prior to said use.

E. Submit to Owner and the Engineer, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected receiving facility.

1. Facility signed manifests and original bills of lading (forms BWSC-12A, -12B and -12C) and material shipping records.

F. Certified tare and gross weights for each waste load removed from the site.

PART 2 - PRODUCTS

2.1 GENERAL

A. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Health and Safety Plan described in Section 013529 “Health, Safety and Emergency Response Procedures.”

B. Massachusetts Department of Environmental Protection

1. Massachusetts Contingency Plan, 310 CMR 40.0000
2. Massachusetts Hazardous Waste Regulations, 310 CMR 30.000
3. Interim Remediation Waste Management Policy for Contaminated Soils, Policy # WSC-94-001.
4. Reuse and Disposal of Contaminated Soils at Massachusetts Landfills, Policy # COMM-97-001.

C. United States Department of Environmental Protection (EPA).

1. Federal Hazardous Waste Regulations, 40 CFR 261-268.

D. Disposal of TCLP material at RCRA Landfills is subject to all applicable provisions of the Phase IV Land Disposal Restrictions (LDR) of 40 CFR 268. The Work of this Section shall include all necessary supplemental treatment required to reduce concentrations of all Underlying Hazardous Constituents (UHCs) to levels below applicable Universal Treatment Standards (UTS) prior to landfill disposal.

PART 3 - EXECUTION

3.1 GENERAL

A. The Owner will be the generator and will sign waste profiles, hazardous waste manifests, non-hazardous waste manifests, bills of lading and material shipping records.

B. Identify appropriate disposal facilities and make all necessary arrangements for disposal of materials.

3.2 DISPOSAL FACILITY TESTING

A. Provide to the Engineer the sampling and analysis requirements for each of the selected soil disposal facilities (i.e., analytical requirements, sampling frequency, etc.).

B. Complete all sampling necessary for obtaining the final approval from the disposal facility.

1. Submit a copy of all analytical results to the Engineer within 10 days of receipt of the laboratory report. Disposal facility testing can be integrated into the stockpile testing specified in Section 026110 “Excavation and Management of Excess Material.”

C. If a less than RCS-1 disposal facility selected by Contractor requires jar headspace screening as a part of their disposal characterization testing, The Contractor will conduct the headspace testing. Based on the headspace readings and/or visual/olfactory observations, Engineer will determine if the material is acceptable to go to the proposed less than RCS-1 facility. If the material is not accepted at an RCS-1 facility, the material would require disposal at the Contractor’s proposed backup in-state unlined landfill facility.

D. If disposal facility testing results exceed the applicable acceptance criteria for the disposal facility identified, soil shall be disposed of at the next applicable category of disposal facility.

E. Sampling of contaminated soil shall be done at sufficient and adequately distributed locations so that the concentrations of the chemical constituents are adequately characterized.

F. Coordinate schedule so that Engineer may observe sample collection.

G. If sample results indicate that the TCLP concentration for any metal exceeds the regulatory limit set forth in Table 1 of 40 CFR 261.24, the soil shall be stabilized to render TCLP concentrations less than the regulatory limit prior to removal.

3.3 WASTE PROFILES AND SHIPPING DOCUMENTS

A. Identify disposal facilities and provide to the Engineer all disposal facility soil acceptance information, including but not limited to waste profile forms, certifications, and acceptance criteria. Perform all coordination with the disposal facilities.

B. Prepare all soil acceptance packages including waste profiles, questionnaires, and material shipping records (MSR) and provide to the Engineer for review and approval. Engineer will review shipping paperwork, prepare and sign as LSP on BOL and LSP opinion letters, and will be responsible for obtaining Owner's signature prior to said use.

C. Following review, submit the completed acceptance packages to the receiving facilities.

D. Prepare all manifests and if necessary, land ban certifications. Engineer will review, approve, and be responsible for obtaining Owner's signature prior to said use.

E. Submit to Owner and the Engineer, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected receiving facility.

1. Facility signed manifests and original bills of lading and material shipping records.
2. Certified tare and gross weights for each load.

© 2024 CDM Smith
All Rights Reserved

3.4 TRANSPORT AND DISPOSAL

A. The Contractor shall not be permitted to transport materials off-site until all disposal facility documentation has been received, reviewed, and accepted by Owner and the Engineer.

B. Transport and dispose in accordance with all United States Department of Transportation (DOT), USEPA, MDEP regulations and other regulations of all affected states.

C. The Contractor shall be responsible for ensuring that free-liquid does not develop during transport. "Wet soils" shall not be loaded for transport. The Contractor shall be responsible to properly dispose of any free liquids that may result during transportation.

D. For TCLP Material, stabilize and reduce UHCs to below applicable UTS to comply with Phase IV of the Land Disposal Restrictions (LDR).

E. Dispose of hazardous waste within 90 days of generation.

END OF SECTION 028100

© 2024 CDM Smith
All Rights Reserved

THIS PAGE INTENTIONALLY LEFT BLANK