



DENVER

THE MILE HIGH CITY

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS | ENGINEERING DIVISION

Storm Drainage and Sanitary Sewer Construction Detail and Technical Specifications

14.0 Removal and Disposal of Construction Debris and Contaminated Materials

14.0.1 General

The Contractor shall be required to transport all non-hazardous solid waste and construction debris to the Denver Arapahoe Disposal Site (DADS) landfill, in accordance with Executive Order 115. Only approved haul routes around DADS may be used (Contractor must contact landfill directly for these routes). Landfill fees, gate fees and applicable State surcharges will be paid for by the City and County of Denver, Engineering Division. The Contractor is responsible for any special handling charges imposed by Waste Management at DADS.

All costs associated with loading, hauling, and disposal of construction debris and/or contaminated soils at DADS shall be considered included within the unit price bid for construction of each section of sewer, the associated structures, laterals and appurtenances unless provided for elsewhere in the Contract Documents. The City and County of Denver, Engineering Division will not provide hauling tickets nor cover the fees associated with disposal of recyclable materials at the DADS landfill. Recyclable materials shall include: concrete, asphalt, clean soil, damp or saturated soils and any other materials generated onsite with a monetary value. No payment will be made for the loading, hauling and/or processing of recyclable materials.

If the waste material cannot be accepted at DADS, Conservation Services Inc. facilities are licensed to accept industrial waste. Facilities in Utah and Texas are licensed to accept hazardous waste. Landfill fees at these facilities will be paid for by the Contractor.

The work required for this section shall consist of exploratory investigation, testing, identification, removal and disposal of construction debris and contaminated materials associated with the construction of pipelines, box culverts, gulches, open channels, ponds and associated structures and appurtenances.

14.0.2 Contaminants

The contaminants required to be removed or treated may or may not be known at the time of award of the work. Contaminated soils may be encountered and have to be identified on the job site. Potentially and/or suspected contaminated sites of known and unknown origin may be listed at the end of the Contract Documents and are identified on the plans.

14.0.3 Environmental Consultant

The City and County of Denver, Engineering Division shall have an Environmental Consultant under contract to help identify, monitor and document and provide other assistance as required.

14.0.4 Contaminated Soil Identification

1. Remediation of soils with unknown contaminants will be performed by the Contractor as described herein or as directed by the Project Construction Engineer with recommendations by the Environmental Consultant. Materials visibly contaminated or having field instrument (e.g. PID, FID, OVA, etc.) readings above established action levels will be excavated, or otherwise loaded for transport to an approved disposal facility or to a temporary storage area designated by the Project Construction Engineer. Appropriate safeguards will be utilized to prevent or limit exposures to stored materials.
2. The stored material will be tested at the contractor's expense for contaminants. As dictated by the proposed disposal facility the parameters to be tested for will be based on the historical use of the area and the requirements of the facility used for disposal. The material will not be stored for more than 90 days.
3. Material identified as hazardous or non-hazardous will be disposed of in a manner consistent with current established federal, state and local regulations for waste material. A hazardous waste contractor shall be required for handling of hazardous material.
4. Materials with contaminants below action levels may be used for fill on-site or transported off-site. Materials with contaminants not specifically regulated will be disposed of as directed by the Project Construction Engineer.
5. The owner of any contaminated material will be the City and County of Denver, for the purposes of permits and disposal only.

14.0.5 Submittal (OSHA Requirements)

The Contractor will submit the following information for approval prior to beginning work or as otherwise specified:

1. **Health and Safety Plan** meeting OSHA requirements of CFR 1910.120. The Health and Safety Plan for remediation work shall address the protection of health, safety and response to contingencies which could occur during remediation. It shall describe known and potential hazards related to remediation work activities. It shall include descriptions of construction and decontamination procedures for personnel and equipment. The plan will only be implemented if contaminated materials are encountered.

The contractor shall provide a project Health and Safety Officer. The project Health and Safety Officer shall be qualified by certification or training in the area of Industrial Hygiene or Hazardous Waste Health and Safety. The officer will have the authority and knowledge to design and implement a site-specific Health and Safety Plan and Hazardous Communication Program and to verify compliance with applicable safety and health requirements.

All persons working in and entering the areas designated by the Health and Safety Officer to be hazardous due to the presence or potential of contacting hazardous substances shall have previously received training according to the requirements in the Hazardous Waste Operation Regulations (OSHA 1910.120).

General site workers involved in construction activities in the designated areas shall receive 40 hours minimum training in the health and safety of hazardous waste; site workers and workers who are on-site occasionally to perform a single specified task shall receive 24 hours minimum of training. Personnel overseeing the health and safety of other workers shall receive an additional eight hours of supervisor training in that capacity. Documents certifying that the training requirements have been met and that all personnel are current on their refresher training shall be present at the project office or trailer or otherwise be made available to the project Health and Safety Officer and/or the Project Construction Engineer.

In addition to the personnel working in the designated hazardous waste sites, all personnel working on this construction project shall be involved in the communication and understanding of potential hazards through a Hazardous Communication Program in accordance with the provisions of OSHA regulation 29 CFR 1910.12. This program shall include all elements of the regulations including training of personnel, compilation of Material Safety Data Sheets (MSDS), labeling, and placarding of hazardous chemicals, hazard identification of the construction area and monitoring of all activities to determine if new hazards are posed to the employees.

Reduced levels of training are to be identified for persons performing short duration or non-intrusive activities in areas in which the concentrations of or the potential for exposures to hazardous chemicals are reduced or shown to be minimal in the designated areas.

The training of employees in the non-designated areas are covered in the Hazard Communication Program for this phase of construction activities. This training shall include the following elements:

1. Methods of detecting hazardous chemicals.
 2. Physical and health hazards of chemicals in the area.
 3. Personal protective measures that are implemented to protect the employees.
 4. Details of the Hazardous Communication Program such as emergency response procedures and location of the Material Safety Data Sheet.
2. **A *Sampling and Analysis Plan*** (SAP) which describes methods of sampling, testing and analysis to obtain additional data on chemical constituents of the various materials. The Environmental Consultant will prepare this plan which shall be reviewed by all parties prior to the commencement of this aspect of construction. The purpose of the SAP will be to provide a basis for classifying a material as hazardous or non-hazardous and to provide confirmation and documentation of completed remediation work as it relates to project construction.
 3. ***Product Data***: Submit the following as part of a Pre-Construction Submittal Package.
 - a. Material list for items proposed to be provided under this section.
 - b. Certificates signed by the materials producer and the subcontractor stating that all material, meet or exceed the specified requirements.
 4. ***Materials Samples***: Submit adequate and representative samples of the backfill material to the Testing Laboratory for pre-construction tests.
 5. ***Test Reports***: Submit at least one week prior to beginning of the work of this section the test reports for the pre-construction testing performed by the Testing Laboratory.
 6. ***Disposal Profile Sampling***: If contaminated soil is known or believed to exist in the project alignment, the contractor shall be responsible for the collection and analysis of samples required for disposal approval. This shall be done in advance of the construction phase.

14.0.6 Materials

14.0.6.1 Backfill Materials

Materials generated on-site or if imported shall be predominantly granular non-expansive soil free from roots and other unsuitable material meeting the requirements of Section 5.0 of these Detail and Technical Specifications. The Contractor shall try to generate all backfill materials on-site. Imported fill materials will only be allowed in cases where sufficient quantities of suitable backfill material cannot be generated on-site.

14.0.6.2 Backfill of Excavated Areas

Excavated areas outside the vertical limits of construction will be backfilled and regraded using uncontaminated soils. Compaction requirements are described in Section 5.0. The fill

materials will be from on-site stockpiles as described above. The surface will be regraded to match natural contours and drainage patterns and the areas to be reseeded or otherwise restored to match existing conditions prior to the contaminated material excavation.

14.0.7 Execution

14.0.7.1 Removal

1. Contaminated materials will be removed to a depth of 3 feet below construction within the horizontal limits of construction at the direction of the Project Construction Engineer. If the contamination extends less than three (3) feet, a minimum thickness of three (3) inches of soils below the contaminated materials will be removed, loaded, transported, and disposed of.
2. Upon completion of initial contaminated material removal, the excavated area will be inspected by the Project Construction Engineer and or the Environmental Consultant and additional materials will be removed as deemed necessary based on visual observations, instrument readings, and the results of initial and confirmatory laboratory testing.

14.0.7.2 Disposal

The contaminated soils requiring disposal will be transported to a land fill approved to accept the waste. The landfill will be approved by the Project Construction Engineer prior to transport and landfill fees will be paid for by the Contractor. A payment item is provided for this in Section IV of this Bid Form and Submittal Package. The Denver Arapahoe Disposal Site (DADS) and the Conservation Services Inc. facilities are licensed to accept non-hazardous waste. Facilities in Utah and Texas are licensed to accept hazardous waste.

14.0.7.3 Confirmation Sampling

1. Upon completion of the contaminated material removal in each area, a confirmation soil sample will be collected by the Environmental Consultant in accordance with a Sampling and Analysis Plan (SAP) and the samples shipped to an approved testing laboratory for analysis.
2. The SAP will be prepared by the Environmental Consultant prior to construction and should contain methods of sampling and analysis to confirm if a material is hazardous or non-hazardous and that remediation work has been completed. The sampling will either be from a discrete location or composited, if appropriate. Duplicate and blank samples will be collected for laboratory quality assurance at the frequency described in the SAP. All samples will be labeled and sealed and appropriate chain-of-custody and shipping procedures followed.

14.0.7.4 Field Testing

1. The Testing Laboratory as designated by the Environmental Consultant, will perform tests and report results as approved by City of Denver Environmental Services (CDEVS) and the City and County of Denver, Engineering Division on soil samples obtained by the Project Construction Engineer. The City's Office of Environmental Services may act as internal consultant to the City and County of Denver, Engineering Division as needed.

2. Obtain the Project Construction Engineer's approval of subgrade materials with respect to the City and County of Denver, Engineering Division requirements before subsequent construction is performed.
3. Notify the City and County of Denver, Engineering Division and the Environmental Consultant of conditions contrary to accepted requirements.
4. The Colorado Department of Hazardous Wastes Management Division (CDHWMD) is the state's agency for reviewing cleanup measures. Since the contaminants and their levels are unknown and the Colorado Department of Hazardous Wastes Management Division does not have specific regulations for cleanup of materials that may be found, they will only "suggest" or review cleanup measures. They will in some cases provide a letter suggesting that they concur with the levels selected but make no commitments regarding long-term liabilities. They will maintain a file on each project if the information is provided to them. The following cleanup levels will be used for the site, but may be modified by CDEVS or CDHWMD.
 - Petroleum Product – 100 ppm TPH, 20 ppm BTEX (RACI)
 - Metals (CERCLA, Ep-Tox or TCLP levels)
 - Volatile and semi-volatile organics – 10 ppm total
 - PCB's – 10 ppm (TSCA regulation)

Cleanup levels are determined on a case-by-case basis for contaminants not specifically regulated under Resource Conservation Recovery Act or Toxic Substances Control Act. The cleanup will be implemented using visual observation of stained areas and an established action level for PID readings in a headspace test of 50 ppm for petroleum contaminated soils and 10 ppm for organic contaminants. If either of these conditions are met, the material will be considered contaminated and stockpiled for sampling, analysis and appropriation of disposal or potential reuse.

5. Test Report: At least once a week prior to the work of this Section, submit test reports for the pre-construction testing performed by the Testing Laboratory.

14.0.7.5 Protection of Storm and Sanitary Sewers

1. Concrete Cut-off Walls as shown in figure 3 of the City and County of Denver, Engineering Division, Standard Detail for Trenching and Bedding (S-301.1) shall be constructed upstream and downstream of the contaminated area to prevent piping of hazardous material from off-site areas.
2. All joints for storm sewer pipe shall be internally and externally grouted to prevent contamination of the storm sewer system.