

SECTION 02115
UNDERGROUND STORAGE TANK REMOVAL

GENERAL

02115-0.1 SECTION INCLUDES.

- A. Utilize industry-approved procedures for removing underground storage tanks (USTs), which includes, but is not necessarily limited to, the following:
1. Removing and disposing free product and product-contaminated liquid and residues.
 2. Purging flammable vapors.
 3. Removing and disposing of the UST.
 4. Backfilling pit.
- B. This section includes language based upon the following Regulatory References, and those technical references cited within them. The Contractor shall be thoroughly familiar with these documents, and shall consider the requirements and procedures of these documents as a part of the requirements and procedures of this section. The Regulatory References will supercede any conflicts between the Regulatory References and this section.
1. Rules of the Tennessee Department of Environment and Conservation (TDEC) Division of Underground Storage Tanks (DUST) - Chapter 1200-01-15, Underground Storage Tank Program.
 2. Tennessee: State Fire Marshal Office.
- C. Eligibility of Contractors. Contractors shall be recognized as Approved Corrective Action Contractors by the TDEC, DUST in order to be eligible for award of this contract.

02115-0.2 RELATED WORK. Related work is specified in the following sections:

Section 02225 - Selective Site Demolition

02115-0.3 SUBMITTALS.

- A. REMOVAL APPROVAL.
1. Submit closure application documentation for the USTs to the **TDEC** Memphis Environmental Field Office (EFO) immediately following contract award and no later than thirty (30) days prior to commencement of removal work. Include one (1) **TDEC** DUST Application for Permanent Closure of Underground Storage Tank (UST) Systems.
 2. Notify the City of Memphis Fire Department and the Tennessee Fire Marshal's office of the permanent closure.

- B. PRE-REMOVAL - Submit a detailed work plan and proposed schedule of tank removal and disposal activities to the F&A no later than seven (7) days prior to commencing removal work. Include:
1. Locations and results of analytical samples required by TDEC DUST per the UST System Closure Assessment Guidelines.
 2. Type of combustible gas indicator (CGI) and statement of technician's expertise.
 3. Method of vapor purging.
 4. Excavation and transportation equipment.
 5. Location and qualifications of tank disposal site(s).
- C. POST-REMOVAL
1. Submit removal and disposal documentation for the USTs to the F&A no later than fourteen (14) days after removal work is substantially complete at each Work Area. Include:
 - a. Closure Assessment Report (CAR) and all associated documentation including the Facility Classification Guide - completed and ready for Owner Signature.
 - b. A table of field screening and analytical results correlated with sample locations.
 - c. Laboratory analysis sheets identifying sample location and sample depth.
 - d. Marked-up site plan drawing showing areas of over excavation, borings, and sample points. Also include soil stockpile location dimensions, and sampling points.
 - e. All documentation (permits, manifests, etc.) relating to disposal of contaminated soils, product, product-contaminated wastes, tanks, and piping.
 2. Submit Notification Form to UST Nashville Central Office within thirty (30) days of removal.
 - a. Indicate the current status of UST system at the facility.
 - b. Include the Facility ID Number (9-791205) and mark "C Closed."

EXECUTION

02115-3.1 PREPARATION.

- A. Comply with all OSHA safety requirements. Minimize safety hazards, including placing barricades around the work site, displaying warning signs, and removing sources of potential ignition.
- B. Establish and maintain proper ventilation procedures in order to keep the work area vapor-free. Monitor for concentrations of potentially explosive vapors using a combustible gas indicator operated by trained personnel.
- C. Determine the disposal method of wastes according to hazard class, compatibility, and disposal destination as required for disposal authorization. Arrange for disposal of waste chemicals to a permitted hazardous waste facility (if required).
- D. Notify area utility companies, the local/state fire marshal, and other local authorities per

local requirements. Notify appropriate TDEC EFO at least one (1) business day prior to removal activities.

E. Designer Notification/Presence:

1. Notify F&A at least one (1) business day prior to actual removal of tank from tank pit, and subsequent soil sampling of pit; and, provide the estimated time of day which these activities shall occur.
2. Unless waived by the F&A, F&A REPRESENTATIVE OR APPOINTED DESIGNEE SHALL BE PRESENT TO OBSERVE TANK REMOVAL AND SOIL SAMPLING.
3. Actual removal of tank from tank pit, and subsequent soil sampling of pit shall occur during a normal business day (Monday through Friday, not occurring on an official state holiday) and between the hours of 8:00 a.m. and 4:30 p.m.

02115-3.2 LIQUID/RESIDUE REMOVAL AND DISPOSAL.

- A. Drain product piping into the tank, being careful to avoid any spillage. Cap or disconnect product piping from tank. If piping is disconnected, cap or plug opening.
- B. Remove liquids and residues from the tank by using explosion-proof or air-driven or hand pumps. Bond pump motor and suction hoses to the tank to prevent electrostatic ignition hazards. Small quantities of free liquids may be solidified or absorbed and removed.
- C. Drain into Tennessee Department of Transportation (TDOT) approved containers. Combine, at the Contractor's discretion, wastes which are determined to be compatible for disposal in large containers.
- D. Solidify, absorb, and dispose of spilled liquids. Contractor shall be responsible for any costs such as sampling, analysis, removal, and disposal resulting from spillage contamination caused by Contractor.
- E. Handle all liquids and residues removed from the tank in accordance with all applicable federal, state and local regulations. Lead compounds and other residues from the tank may be classified as hazardous wastes.
- F. Label, transport and manifest (if required) wastes to the disposal facility(ies) in accordance with all applicable federal, state and local regulations.

02115-3.3 FLAMMABLE VAPOR REMOVAL.

- A. Inerting or purging shall be done in the time period immediately prior to removal of the tank.
- B. Begin excavation to expose the top of the tank. If shown on the Drawings where only portions of asphalt/concrete requires removal, neatly sawcut these surfaces prior to excavation. Remove the minimum amount of concrete or asphalt necessary, or to nearest reasonable pavement joint, to excavate the tanks. Otherwise, remove homogenous surfacing entirely.
- C. Remove ancillary equipment, except a single vent line, which should remain connected

until inerting is completed. Alternatively, install a threaded 12-foot galvanized pipe in the access port opposite the one to be used for the inerting process. In either case, the vent should terminate at least 12 feet above grade and 3 feet from adjacent roof lines.

- D. Temporarily plug remaining tank openings until tank purging is complete.
- E. Purge tank and piping thoroughly to displace vapors using one of the following approved methods: Adding 1.5 pounds of dry ice (solid CO₂) per 100 gallons of tank capacity. Purging vapors by means of compressed air or fan ventilation. Or, by passing an inert gas such as Nitrogen or Carbon Dioxide through the tank under low pressure. Other methods may be utilized upon approval by Designer.
- F. Test tank interior atmosphere using a properly calibrated and maintained combustible gas indicator. Readings shall be taken at the bottom, middle, and upper portions of the tank. Continue purging as required to ensure that subsequent natural ventilation will not result in the reinstatement of a flammable atmosphere.
- G. The tank shall be considered sufficiently purged of vapors when readings indicate an explosive level not exceeding 20 percent of the lower flammable limit for the regulated substance.
- H. Remove any obstructions from the vent pipe to allow for continuous ventilation. The tank shall be tested at periodic intervals for explosive limits up to the point that the tank leaves the site.

02115-3.4 SOLIDS REMOVAL DISPOSAL.

- A. Remove all free liquids, expose tank top, and purge all vapors from tank as described in Sections 3.2 and 3.3.
- B. If contractor chooses to remove portions of the tank top wall to aid in removal of the solids, care must be taken to prevent ignition sources. Cutting torches and spark producing tools shall not be used.
- C. Place solids into TDOT approved containers. Combine, at the Contractor's discretion, wastes which are determined to be compatible for disposal in large containers.
- D. Solidify, absorb, and dispose of spilled liquids. Contractor shall be responsible for any costs such as sampling, analysis, removal, and disposal, resulting from spillage contamination caused by Contractor.
- E. Handle all materials removed from the tank in accordance with all applicable federal, state and local regulations. Lead compounds and other residues from the tank may be classified as hazardous wastes.
- F. Label, transport and manifest (if required) wastes to the disposal facility(ies) in accordance with all applicable federal, state and local regulations.

02115-3.5 TANK REMOVAL AND DISPOSAL.

- A. Prior to beginning the tank removal work, and prior to beginning each day required for completion, test tank interior atmosphere to assure an explosive level not exceeding 20 percent of the lower flammable limit for the regulated substance. If necessary, additional vapors shall be purged from the tank as described in Part 3.3 of this section.
- B. Install one 1/8th inch vent hole at top-most portion of tank to allow for tank interior pressure equalization with outside atmosphere. Plug or cap all remaining tank holes. The tank must always be positioned with vent hole on top.
- C. Excavate the tank, removing soil as necessary for removal of the tank. In the event that the boundaries of the excavation may jeopardize the structural integrity of adjacent structures or utilities, install an excavation support system.
- D. The excavated soil shall remain on-site until it has been analyzed for possible contamination and the excavation is approved for backfilling. Place soil adjacent to the tank excavation area onto polyethylene (6 mil minimum) surrounded by straw bales. Cover soil with 6 mil polyethylene at the end of each work day. If olfactory or visual detection readily indicates contamination, Contractor may haul soil to designated stockpile area. In any case, maintain separately soils obviously contaminated from soils not obviously contaminated.
- E. Stockpile clean soil for later use as backfill. Place clean soil adjacent to the tank excavation area onto polyethylene (6 mil minimum) surrounded by straw bales. Cover stockpiled soil with 6 mil polyethylene at the end of each workday.
- F. Remove the tank, as a whole, from the excavation using lifting equipment of adequate capacity. THE TANK SHALL NOT BE CUT INTO SECTIONS ON-SITE. Place tank on a level surface. Use wood blocks or rubber tires to prevent movement of tank.
- G. Immediately after removal from the ground and prior to removal from the site, label the tank. Regardless of the condition of the tank, the label must contain a warning against certain types of reuse. The former contents and present vapor state, including vapor-free treatment and data should also be indicated. The label should be similar to the following, and written with legible letters at least 2 inches high:

"TANK HAS CONTAINED <insert type of fuel (JetA or 100LL)>
VAPOR FREE
NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS
NOT INTENDED FOR HUMAN OR ANIMAL CONSUMPTION
DATE OF REMOVAL: MO/DAY/YR"
- H. Just prior to removal from the site, test tank interior atmosphere to assure an explosive level not exceeding 20 percent of the lower flammable limit for the regulated substance. If necessary, additional vapors shall be purged from the tank as described in Part 3.3 of this section.
- I. Secure tank onto a truck of adequate capacity for transportation to the storage or disposal site, and positioned with the 1/8th inch vent hole located at the top of the tank. All other holes or penetrations shall be capped, plugged, or otherwise sealed. Tanks shall be transported in accordance with applicable local, state, and federal regulations.

- J. Upon completion of the UST removal operation, leave tank pit site in a suitable condition for excavation, backfilling and grading operations as specified below.

02115-3.6 EXCAVATION, BACKFILLING AND GRADING

- A. **SUMMARY.** Section includes operations required to achieve required excavation, backfilling and grading associated with the function of proper removal of underground storage tanks (USTs) and demolition of associated structures and appurtenances. The Contractor shall be attentive to the particular hazards associated with such operations, and take appropriate safety precautions.
- B. **SUBMITTALS.** Imported backfill and top-soil shall be subject to the approval of the F&A. Submit source and sample of material to be used.
- C. **BACKFILL.** Cost of backfill material sufficient to replace contaminated pit fill and to fill overexcavated areas, if required, shall be included in the cost of the tank removal.

Inspect areas to receive backfill material to insure they are free of wood, rubbish, water and any other deleterious materials. Do not begin work until soil is dry enough to be tillable.

Place and compact backfill materials in uniform horizontal layers no more than 12 inches deep (loose measurement). The backfill shall be compacted to a density of not less than 95% of the maximum density as determined by ASTM 698. The material to be compacted shall be within +/- 2% of the optimum moisture content before rolled to obtain the prescribed compaction (except for expansive soils).

Demolished material and rubble shall not be used as backfill material.

- D. **TANK PIT EXCAVATION AND FIELD SCREENING.** Following removal of the tank from the pit, field screen soil immediately underneath the tank using a Volatile Organic Compound Analyzer, such as PID or FID. Excavate remaining backfill material until native soil or rock is encountered and perform field screening.
- a. If field screening of native soil indicates no contamination, then proceed with collection of final samples and backfilling and grading operations as specified beginning with Part 3.8 of this section.
 - b. If field screening of native soil indicates presence of volatile organic compounds above the regulatory limits, then notify F&A to receive one of the following instructions:
 - i. If F&A concludes that conditions indicate a substantial release of petroleum has occurred which cannot be removed by overexcavation of up to 100 cubic yards, then F&A shall issue a "stop work" order to determine the appropriate course of action.
 - ii. If F&A concludes that field screening results indicate feasibility that overexcavating not-to-exceed 100 cubic yards will render free of contaminated soils, then F&A shall instruct Contractor to proceed with overexcavating operations as specified in Part 3.6 (E) of this section.

- E. **TANK PIT OVEREXCAVATION AND FIELD SCREENING.** Upon receipt of written

instructions by F&A, Contractor shall proceed with overexcavation operations as follows:

- a. Overexcavate soils in area(s) of contamination indicated by the field screening results of the excavated pit. Conduct field screening of the overexcavated soil continuously. Stockpile soils as indicated in contract documents.
- b. Stop overexcavation at any point prior to, or upon overexcavating up to 100 cubic yards, when field screening of soil being excavated indicates that contamination has been removed, and no visual evidence of a petroleum release or strong petroleum odors exist in the undisturbed soil in the pit, then proceed with collection of final samples and backfilling and grading operations as specified beginning with Part 3.6 of this section.
- c. If field screening of native soil upon overexcavating 100 cubic yards still indicates presence of volatile organic compounds above the regulatory limits, contractor shall stop work immediately and notify F&A to receive one of the following instructions:
 - i. If F&A concludes that limited additional excavation would remove contaminated soil, then F&A shall instruct Contractor to continue overexcavation and field screening within not-to-exceed limits, collect final samples and backfill the excavation.
 - ii. If F&A concludes that limited additional excavation would not remove contaminated soil, then F&A shall issue a "stop work" order to determine the appropriate course of action.
- d. Document the work of each overexcavation producing a scaled drawing on 8.5 x 11 inch paper of the tank pit, overexcavation area(s), and sample points. Label each sample point in a manner which corresponds with the actual sample identification labeling.

- F. **SUBGRADE GRADING.** Place grade stakes wherever necessary to bring the work accurately to elevations required. Verify that backfill and unfilled excavations have been previously graded and compacted to six inches (6") below finish grade.

Grade to the depths required for the Work as follows:

- a. Grade uniformly with rounded surfaces at the tops and bottom of abrupt changes of planes.
- b. Protect graded areas from undue erosion, and repair and regrade areas where erosion does occur. Refill areas where noticeable settlement has occurred.
- c. Grade areas that are to receive stone base to six inches (6") below finished contour elevations.
- d. Where existing subgrade is used for areas to receive paving, scarify subgrade to depth of three inches (3").

Finish grade the entire site to match existing grade elevations to provide uniform slope and positive drainage of the site.

- G. **EXCESS MATERIALS.** Dispose of excess materials and debris away from the site.

02115-3.7 DEWATERING. Dewatering during excavation may be required during the removal of underground storage tanks. Water obtained from the excavation may be contaminated with petroleum products in concentrations above the TDEC DUST allowed levels.

The Contractor shall be responsible for selecting, furnishing, maintaining, operating, and removing the water as necessary in the performance of work specified herein and as related to other sections of these specifications. The water will be handled as specified in the TDEC DUST Chapter 1200- 01-15.

The Contractor shall also dewater the excavated areas should precipitation, surface runoff, groundwater or any other liquid accumulate during excavation and backfilling, as necessary.

A. SUBMITTALS. Manifests documenting disposal of contaminated water.

02115-3.8 FINAL SOIL AND WATER SAMPLING. Sample in accordance with the Rules of the TDEC Division of Underground Storage Tanks, Chapter 1200-01-15-.07(5).

Water encountered in tank excavations shall be removed and properly disposed in accordance with the Rules of the TDEC DUST, Chapter 1200-01-15-.07.

Collect excavated material samples in accordance with TDEC DUST, Chapter 1200-01-15-.07.

Final samples shall be submitted to Environmental Testing and Consulting laboratory for analysis, which shall follow the current analytical requirements for soil and water samples in TDEC DUST, Chapter 1200-01-15-.07.

Upon receipt of results of laboratory analysis, submit to the appropriate field office the following documentation:

- a. Laboratory analysis sheets (original or carbon copy - not photocopy);
- b. Site map showing all sampling points and a distance referenced from the stockpile to a permanent fixed point.
- c. Field screening data.

METHOD OF MEASUREMENT

02115-4.1 Underground Storage Tank removal will be measured by the unit for the completion of the work as described above and will include removal of tank, any associated pipes, cathodic protection, etc. Payment will be made on a lump sum basis.

Removal and proper disposal of petroleum contaminated soil shall be measured by the cubic yard for completion of the work as described above.

Removal and proper disposal of petroleum contaminated water shall be measured by the gallon for completion of the work as described above.

BASIS OF PAYMENT

02115-5.1 Lump sum payment shall be made by the unit for the completion of the work as described above, and partial payment will be made according to the following schedule:

PAYMENT SCHEDULE

Percent of Total Contract Amount of Estimate	Percent of Lump Sum Bid Item
2%	20%
10%	40%
20%	50%
40%	65%
60%	80%
80%	100%

Payment will be made under:

Item 02115-1 Remove one 10,000 gallon tank - per Lump Sum

Item 02115-2 Remove one 10,000 gallon tank - per Lump Sum

Item 02115-3 Remove and properly dispose of petroleum contaminated soil- per cubic yard

Item 02115-4 Remove and properly dispose of petroleum contaminated water - per gallon

END OF SECTION 02115