**SECTION 33 56 10**

**FUEL STORAGE TANK DEMOLITION**

**BASED ON DFD MASTER SPECIFICATION DATED 10/1/12**

***(Note to the designer: This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written. The Division of Facilities Development expects changes and comments from you.***

**P A R T 1 - G E N E R A L**

**SCOPE**

Provide all work needed for removal and closure of underground fuel storage tanks as required in these specifications and on the drawings. Work shall be completed in compliance with applicable local, state, and federal rules and regulations governing tank removals and the handling, transport, and disposal of sludge and liquid wastes, tanks and associated piping, and other waste materials.

 Part 1 - **General**

 Summary of Work Included
 Related Work Covered Elsewhere
 References

 Quality Assurance
 Protection of Existing Work and Facilities
 Provisions for Future Work
 Construction Limits

 Notification/ Permits

 Closure Assessment Plan

 Discontinuation of Utility Services

 Tank Information

 Closure Documentation

 Part II - **Materials**

Equipment
Barricades and Warning Devices
Controlled Backfill

Owner Furnished Materials
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 Part III - **Execution**

General

Protection of Tank Site
Utility Lines
Site Demolition
Storage of Salvaged Materials
Mechanical and Electrical Components
Tank Preparation/Purging/Bottom Wastes

 Tank Removal/Cleaning/Disposal

 Site Assessment

 Contaminated Site

 Disposal of Contaminated Soil

 Backfilling

 Site Restoration

**SUMMARY OF WORK INCLUDED**

The scope of work includes but is not limited to:

* Notification of state and local authorities; development of Closure Assessment and Site Safety Plans; site demolition; other pre‑closure activities.
* Preparing tank(s) for removal and purging tank(s) of flammable vapors.
* Cleaning tank(s) and proper handling and disposal of contaminated tank wastes and sludge.
* Removal and safe disposal of the underground fuel storage tank(s) and associated piping.
* Performing assessment of tank site(s); sampling and testing soil and groundwater for possible contamination.
* Backfilling and restoring tank site(s).
* Preparing Closure Assessment Report(s) within 30 days of the date of tank removal, documenting all actions taken by the contractor and lab test results.

**RELATED WORK COVERED ELSEWHERE**

 ***(Note to designer: edit following list of related sections included/not included in this specification.)***

Other related work:

* Clearing and Earthwork: Section 02200.
* Erosion Control: Section 02270.
* Paving and Surface Work: Section 02500
* Temporary Construction Site Barriers: Section 02835

**REFERENCES**

Applicable provisions of Division 1 shall govern work of this section.

Work shall conform to procedures and practices in the following regulatory guidelines and industry standards:

* WI Admin. Code COM 10, “Flammable and Combustible Liquids”.
* NFPA 327, "Standard Procedures for Cleaning & Safeguarding Small Tanks".
* API 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks".
* API 2015, "Safe Entry and Cleaning of Petroleum Storage Tanks".
* National Institute for Occupational Safety and Health, "Criteria for a Recommended Standard.- Working in Confined Space".
* Department of Commerce, "Tank Owners Guide for Underground Storage Tanks".
* DNR Publication SW-130, "Leaking Underground Storage Tank (LUST) Analytical Guidance".
* DNR Publication SW-175, “Site Assessments for Underground Storage Tanks - Technical Guidance”.

**QUALITY ASSURANCE**

Comply with applicable rules, regulations, codes, and ordinances of local, state, and federal Authorities and regulations of public utility companies having jurisdiction over the work.

Only qualified persons certified by the Department of Commerce shall perform tank removal, tank cleaning, and site assessments.

Obtain and pay for necessary permits, licenses and certificates required.

Obtain and pay for necessary permits and certificates required and give proper notices for and during performance of site demolition and tank removal work.

Comply with local Fire Department requirements.

State and local code requirements shall control the handling, storage, transportation, and disposal of solid wastes, contaminated soils and excavation water, tank scrap materials, hazardous or non-hazardous tank bottom wastes, and other demolition materials.

**PROTECTION OF EXISTING WORK AND FACILITIES**

Tank location(s) shown on site plan is approximate. Make such explorations and probes as necessary to locate tank and ascertain any required protection measures that shall be used before proceeding with site demolition and removal of underground tank(s).

Verify the locations of, and protect, any signs, paved surfaces, buildings, structures, sidewalks, landscaping, streetlights, hydrants, data transmission, utilities, and all other such facilities and improvements that may be encountered or interfered with during the progress of the work, both inside and outside the construction limits .

Take all measures necessary to safeguard all existing work and facilities which are outside the limits of the work or items which are within the construction limits but are intended to remain.

Provide and maintain adequate catch platforms, warning lights, barricades, guards, weather protection, dust protection, fences, planking, bracing, shoring, piling, signs, and other items required for proper protection of work.

Provide protection for workmen, public, adjacent construction, and occupants of existing building(s).

Burning of debris on property not permitted.

Provide adequate fire protection.

Explosives shall not be used.

Provide protection for adjacent private property.

Proper erosion control practices shall be employed to minimize surface runoff to adjacent properties, nearby streams, or other surface waters. Erosion control shall comply with the Wisconsin Construction Site Management Practices Handbook ***(Also see Specifications Section 02270 - Erosion Control, that may be used to reinforce this requirement if needed.)***

Be responsible for any public sidewalk, curb, gutter or street paving damaged by any operation under this contract, and be responsible for the repair of all damage in compliance with local municipality rules and regulations at no additional expense to the Owners.

Make repairs or provide new replacement of all damage which is not part of the work on project site or to adjacent property to Architect/Engineer or Owner's satisfaction.

**PROVISIONS FOR FUTURE WORK**

***(Note to the designer: in this subsection explain what future extensions, options, or additions to the currently proposed work that need to be observed by the Contractor in this work.)***

The Contractor shall coordinate hiswork and site access requirements to the site with the DFD Project Representative and user agency prior to start of work to avoid conflicts with other site activities or future work.

**CONSTRUCTION LIMITS**

The work of this Section shall be confined to the Construction Limits as indicated on the drawings. In the absence of such a designation on the drawings, the work shall be confined to the minimum area reasonably necessary to undertake the work as determined by the Engineer. All areas disturbed by the site demolition, excavation, and tank removal work, plus such additional areas as are disturbed by construction related activities including construction access and storage shall be considered the "Construction Area."

**NOTIFICATION/ PERMITS**

Notify in writing the local fire department chief, the local WI Department of Commerce authorized agent, and the Project Engineer of closure schedule at least 15‑30 days prior to removal of tank. Obtain permits, coordinate with local fire officials, and comply with local ordinances governing tank closures.

**CLOSURE ASSESSMENT PLAN**

Develop a written Closure Assessment and Site Safety Plan, including proposed field assessment procedures, tank cleaning and disposal procedures, contaminated liquid waste and sludge management, wastewater handling and disposal procedures, and a contingency plan for managing contaminated soils and excavation water. Wash water from tank cleaning shall be kept separate from contaminated liquid and sludge waste to minimize waste disposal costs. Plan shall meet minimum requirements of COM 10, Appendix B, and must be available for reference at the site during tank removal and assessment activities.

**DISCONTINUATION OF UTILITY SERVICES**

 ***(Note to Designer: Edit the following list to reflect existing site utilities that will be encountered.)***

Disconnecting and restore any utility services that may interfere with tank removal.

Notify companies and local authorities owning poles, conduit, wires or pipes running to the building or structure. Take out all required permits and pay all required fees related to this work.

Existing service piping and utilities, including but not limited to:

* Sewer, water and gas.
* Electrical service
* Telephone, fire alarm system, data, and intercommunications.

**TANK INFORMATION**

 ***(Note to Designer: All information referred to in this article may not be available and references to any unknown data should be omitted.)***

A list of tanks to be removed under this contract is attached. Also provided is available information about tank size, type of construction, contents, age, and other pertinent information.

A site location map and a plan of each tank site is attached, showing approximate location of buildings, site development, property lines, name of contact person, etc. This is not to scale and should not be used to evaluate site conditions or estimate work quantities for bidding.

**CLOSURE DOCUMENTATION**

Complete a Department of Commerce "Underground Petroleum Tank Inventory", form SBD‑7437, and submit to the Department of Commerce at the address shown on the form. Send an additional copy to the State Project Representative.

Tank removals must be properly documented. Documentation shall conform to the minimum requirements listed in WI Admin. Code COM 10, Appendix B.

Department of Commerce "Checklist For Underground Tank Closure", form SBD‑8951, shall be completed for each tank removal and submitted to the Department of Commerce at the address shown on the form. Send an additional copy to the Project Engineer. Preferably, this form should be completed by an environmental consultant, Department of Commerce or DNR agent, local fire chief, or other neutral third party.

Prepare a Closure Assessment Report, documenting all tank removal and site assessment activities, analysis results, and other documentation within 30 days of the removal date. Copies of the report should be sent to the following:

* Bureau of Solid and Hazardous Waste Management
Environmental Response and Repair Section
Madison, WI 53707
* Division of Facilities Development
PO Box 7866
Madison, WI 53707
* State Owner Agency(as directed by Project Representative)

**P A R T II - M A T E R I A L S**

**EQUIPMENT**

Use Contractor's normal equipment for demolition and tank removal which meets all safety requirements imposed on such equipment and provides adequate safeguards against ignition of flammable vapors.

**BARRICADES AND WARNING DEVICES**

Provide traffic barricades and warning devices in accordance with governing codes and regulations and the Manual of Uniform Traffic Control Devices (MUTCD).

Provide protective barrier fencing in ***[plastic, blaze orange color OR chain link fence sections OR plywood barriers*]** together with all supports and braces necessary to provide an adequate safety barrier to unattended excavations. **(Also see S*pecification Section 02835 - Temporary Construction Site Barriers, that may be used for complex sites)***

Provide all necessary warning signing as required by OSHA, these specifications, or as shown on the drawings.

**CONTROLLED BACKFILL**

Provide sand or pit-run sand/gravel, graded from 1 inch maximum downward through the particle range. Not more than 5% of material passing #4 sieve shall pass number 200 sieve.

**OWNER FURNISHED MATERIALS**

***(This article is intended to alert the Contractor that the Owner will be furnishing some equipment or materials that will have to be received, stored, installed and/or which will need final connection for the completed project. In some cases, it may be appropriate to refer to other sections for a more complete description of the equipment being furnished or the work involved in installation.)***

**ITEMS FOR STORAGE/ REUSE**

***(Note to the Designer: Include a listing of items known to require storage and/ or reuse.)***

**P A R T I I I - E X E C U T I 0 N**

**GENERAL**

***(Note to the Designer: Discuss the interruption of any traffic or deliveries with the occupants of nearby buildings to determine how interruptions can best be made with minimum disruption. If work is required outside of regular work hours, this must be indicated in the specifications and/or working drawings. Add specifics regarding locations, hours, lengths of disruption, etc.)***

***(Add provisions, if needed, for security requirements for work performed at a correctional institution)***

All work shall be in accordance with these specifications and all applicable codes, laws, and ordinances. Accomplish all work required by drawings, including work specifically related to work notes.

The contractor shall meet with the DFD Project Representative and user agency at a preconstruction meeting to review site conditions, the Closure Assessment Plan, procedures for handling wastes, site access and control, administrative procedures, and work schedule.

Do not interrupt or change existing traffic patterns or delivery services without prior approval from the Project Representative. When interruption is required, coordinate schedule with the Owner agency to minimize disruptions. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during normal working hours.

Remove all items requiring salvage unless designated "To be removed by Owner".

Where indicated to be turned over to Owner, deliver to location on property where designated by Owner. Exercise care to insure that all items specified or designated on drawings for reuse are carefully removed and stored until they can be reinstalled by trades reusing same.

Coordinate activities to permit access by Owner and other trades required for the work, enabling them to complete work which is assigned to them.

**PROTECTION OF TANK SITE**

Provide and maintain fencing around the site and provide protective barricades, signs, warning lights, and/or other equipment necessary to keep the tank site safe under all circumstances as shown on the plan or determined necessary by the Project Representative.

No excavation shall be left unattended without adequate protection.

Protect existing vegetation outside excavation area from unnecessary damage. Provide protection barrier fencing as needed for all landscape features and structures not noted for removal.

Maintain and protect services and utilities that must remain in operation.

Furnish and install any shoring and underpinning needed to protect the excavation or nearby structures.

Protect paving, sidewalks, curbs, gutters, and landscaping that will remain in place.

Provide appropriate erosion control measures and keep streets, walks and all other adjacent paved areas clean and swept clear of dirt, mud and debris that are deposited as a result of this operation.

**UTILITY LINES**

Contractor shall verify presence of existing site utilities and contact local diggers hotline for specific line locations if needed.

Shut off, cut and cap utility services to each tank(s) to be removed in accordance with the requirements of the utility.

Notify and coordinate shutdown with user agency.

**SITE DEMOLITION**

***(Note to Designer: The following article should be edited to reflect any special site demolition requirements.)***

Demolish and remove all structures within the construction limits including platforms, steps, retaining walls, fences, slabs on grade and all paved surfaces such as walks, drives, and parking areas that interfere with removal of underground tanks. Remove completely all trees and stumps indicated on the plan to be removed.

Remove electrical system, tank related appurtenances, and other site improvements as required for tank removal.

Remove below grade items encountered such as slabs or foundations which interfere with tank removal.

Saw cut bituminous and concrete pavement around area of excavation to provide a smooth straight edge for repair.

Conduct demolition work with minimum interference of roads, streets, driveways, sidewalks and other facilities including adjacent building or structures and their occupants.

Do not close or obstruct traffic on streets, nor close sidewalks, alleys, or driveways without proper city permit. Do not store materials in streets or walks.

Properly barricade all streets, sidewalks, alleys, parking lots, or driveways which are not separated from the work activities by adequate distances to the satisfaction of the engineer.

Carry out vehicle loading as necessary within the project boundaries or as defined or indicated on the drawings, but not in locations that block vehicular traffic on the streets or pedestrian traffic on adjacent public walks.

Immediately and completely remove by scraping, sweeping, shoveling or other such method (except flushing), any demolition debris reaching a public or private roadway, parking lot, sidewalk, or other paved area and which constitutes a hazard to traffic or which may be further scattered by traffic. Any accumulations not requiring immediate attention shall be completely removed at least once at the end of each work day.

No blasting or burning will be permitted on the site(s)

Install temporary shores, struts or bracing where necessary to guard against movement, settlement or collapse of any surrounding buildings or structures designated to remain, and be responsible for repairing any damage related to this activity.

Be liable for movement, settlement, or collapse of any surrounding construction.

Completely demolish buildings and other such structures as shown on plans and remove from site. Use such methods as required to complete work within limitations of governing regulations.

Break up and remove concrete foundations and slabs-on-grade, unless otherwise shown to remain.

Inert demolition materials may be deposited in bottom of excavation prior to placement of backfill. Demolition materials not suitable for backfill are the property of the contractor unless indicated otherwise, and shall be removed from the site and properly disposed.

Backfill which contains rock, boulders, concrete, paving, masonry, other inorganic materials shall be buried under following conditions: None shall be closer than 10 feet of any structure or buried utility. When buried under paving or other surfaced areas, bury 2 foot below subgrade elevation and provide controlled fill over to subgrade elevation.

Break rubble down, not to exceed 1/2 cu. ft. in size, place in parallel layers not exceeding 12 inches with all voids filled and compacted. Provide a minimum of 6 inches compacted earth fill between each layer.

Demolition debris not containing hazardous materials may be treated as a solid waste and shall be removed from the site properly disposed. Facilities for recycle, disposal, or landfill shall be approved by the Project Representative prior to removal form the site.

**STORAGE OF SALVAGE MATERIALS**

The Contractor shall be responsible for the safe storage of all salvage materials until turned over to the Owner or reinstalled. Store salvaged materials where directed by Owner and/or where indicated on drawings until turned over to owner or accepted by the Owner following reinstallation.

**MECHANICAL AND ELECTRICAL COMPONENTS**

Remove and/or demolish all plumbing, mechanical and electrical components not requiring salvage or reuse.

Cut fire alarm systems and other electrical systems in such a manner as to insure continued operation of the Owner's systems.

Disconnect services to equipment at unions, flanges, valves, or fittings wherever possible.

Take all necessary precautions while dismantling piping containing gas, gasoline, oil or other explosive or injurious fluids. Store such piping outdoors until vapors are removed.

**TANK PREPARATION/PURGING/WASTE DISPOSAL**

Drain product piping into tank. Any remaining product at least two inches above tank bottom or accumulated water level, whichever is higher, is considered reusable and shall be removed by the contractor using explosion proof pumping equipment and recycled.

Excavate to top of tank. Remove fill pipe or other fixtures. Vent should be left intact until tank is purged. Plug all other tank openings.

Topsoil shall be stockpiled for reuse in site restoration. Other non‑contaminated soil may be saved for backfill if acceptable. Non‑acceptable materials must be removed from the site and properly disposed. Contaminated soil shall be handled and disposed in accordance with the Contractor's Contingency Plan and as specified.

Appropriate precautions must be taken to prevent ignition of flammable vapors. Purge the tank of flammable vapors while in ground and before performing any other work on the tank using one of the methods described in API Recommended Practice 1604. Vent vapors from the tank at a minimum height of twelve feet above grade or three feet above adjacent roof lines.

Vapor concentration of tank atmosphere and excavation area should be tested using a properly calibrated combustible gas indicator. Concentrations should be less than 10% of the lower explosive limit of the tank contents before removal of tank bottom wastes or removal of the tank from the ground. Persons performing vapor testing must be completely familiar with the use of the gas indicator instrument and interpretation of its readings.

The remaining tank bottom wastes shall be removed from the tank and properly disposed in accordance with the contractor's Waste Management Plan. Wastes may be classified as either hazardous or non‑hazardous depending upon the flammable characteristics of the tank contents. Contractor shall determine if waste materials are hazardous and handle accordingly. Liquid and sludge wastes classified as hazardous must be handled, transported and disposed in accordance with DNR hazardous waste regulations.

Document the chain of custody and disposal method used. The owner agency will arrange for an EPA Hazardous Waste Generator ID Number, if needed.

**TANK REMOVAL/CLEANING/DISPOSAL**

 ***(Note to Designer: Also see Specification Section 02200 - Clearing and Earthwork that may be used for complex tank excavations, or if needed appropriate provisions form Section 02200 can be added to this article.)***

After the tank has been freed of vapors, and before it is removed, plug or cap all holes, leaving a 1/8 inch vent hole at the highest point in the tank.

Excavate around the tank to uncover it for removal. Contaminated soil shall be stockpiled on‑site in a location designated by the property owner in accordance with the Contractor’s Contingency Plan.

Remove tank from excavation and place it on a level surface, and block to prevent movement. Use screwed plugs to plug any corrosion holes in the tank shell.

The tank must be thoroughly cleaned of any remaining sludge or other residues before transport from the site. Tank washwater or other non‑hazardous wastes should be collected separately and properly disposed in accordance with the contractor's Waste Management Plan. The tank becomes the property of the Contractor and should be cut up on site and sold as scrap or properly disposed as solid waste.

Document the chain of custody and tank disposal method used. Tanks removed from the site should be properly labeled and transported in accordance with local, state, and federal regulations.

**SITE ASSESSMENT**

 Soil sample collection and analysis procedures shall be completed in accordance with the contractors Field Procedures Plan. Samples must be collected by persons who are familiar with the plan and who are certified by the Department of Commerce to perform site assessments, or are working under the supervision of a certified person.

Field instruments including photoionization detectors (PID's), flame ionization detectors (FID's), and portable gas chromatographs (GC's) may be used for field screening of soil samples and to choose samples for lab testing. by a certified lab. Field instruments shall be used in accordance with DNR approved techniques, WI Admin. Code COM 10, Appendix B.

Soil samples shall be taken following recommended procedures in the DNR publication, “Site Assessments for Underground Tanks” and in the WI Admin. Code, COM 10 Appendix B, and submitted to a DNR certified lab for appropriate analysis per DNR requirements. Up to Three soil samples and lab tests shall be included in the base bid for each tank, including heating oil tanks less than 4,000 gals. If additional samples and lab tests are needed, they will be paid as an extra based on actual costs.

If groundwater is found within the tank excavation, a sample of groundwater must also be properly collected and submitted to lab for appropriate analysis. The cost of groundwater testing will be paid as an extra based on actual costs.

**CONTAMINATED SITE**

If obvious contamination exists, the contractor shall **immediately** notify the Project Representative. If free product, heavily saturated soils, or other conditions dictate that a remedial investigation and extensive corrective actions will be needed for clean closure, the soil sampling and lab testing may not be completed, and the excavation shall be protected by backfilling filling with clean soil or providing a temporary barricade as directed by the Project Representative.

The Base Bid will be adjusted for the addition or reduction in scope of work resulting from a contaminated site, including the omission of soil samples and lab tests, the omission of backfill, and/or the addition of a temporary barricade.

If the contamination is judged as minimal based on observations and field screening, the Project Engineer may direct the contractor to proceed with over‑excavation, up to a maximum of 30 cubic yards, to achieve a clean closure. Excavation and stockpiling of contaminated soils may be governed by OSHA "Hazardous Waste Operations and Emergency Response Standard 1910.12".

Contaminated soil from over‑excavation shall be combined with that from tank removal and stockpiled on site in a location designated by the property owner. Stock pile shall be placed on an impervious surface and covered with an impervious membrane securely fastened in place. Contaminated excavation water shall be handled and disposed in accordance with the Contractor’s Contingency Plan.

**DISPOSAL OF CONTAMINATED SOIL**

***(Note to Designer: Disposal of contaminated soil may be accomplished by other methods depending upon the site conditions and anticipated quantity involved. the following article must be edited to reflect the disposal method selected.)***

Responsibility for disposal of contaminated soil may be assigned to the Contractor. If directed by the Project Representative, Contractor shall collect samples from stockpiled soils following DNR recommended procedures, submit samples to lab for appropriate lab analysis, and prepare and submit to DNR an "Application To Treat Or Dispose of Petroleum Contaminated Soils", Form 4400‑120. After receiving DNR approval, the contaminated soil shall be removed from the site, and properly transported and disposed.

Costs related to authorized over-excavation, including additional excavation and resulting additional backfill, additional sampling and testing, permitting for disposal, and transport and disposal of contaminated soil and excavation water will be paid as an extra based on actual documented costs.

**BACKFILLING**

Following tank removal, excavations in non paved areas shall be backfilled with satisfactory soil materials consisting of broken concrete, clean excavation materials, or borrow fill provided by the Contractor. Borrow fill may not contain broken concrete or stones grater than 2 inch in diameter and must be free from debris, trash, frozen materials, roots and other organic matter organic matter.

Excavations under roads, parking lots, sidewalks, or other paved areas shall be backfilled with materials meeting the specification for controlled backfill materials.

Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen materials, trash and debris.

Completely fill below grade areas and voids resulting from demolition of structures and tank removal.

Place fill materials in uniform horizontal layers not exceeding 6" in loose depth. Machine compact each layer at optimum moisture content of fill material to a density equal to original adjacent ground, unless subsequent excavation for new work is required.

After fill placement and compaction grade surface to meet adjacent contours and to provide flow to surface drainage structures.

**SITE RESTORATION/CLEANUP**

***(Note to Designer: Site restoration may be covered by other related sections of this specification and paving may be required as part of Base Bid rather than being optional. Also see Specification Section 02500 - Paving and Surfacing that may be used if needed, or appropriate provisions from Section 02500 may be added to this article. Edit the following to reflect actual site restoration requirements of the project.)***

Surface restoration in tank excavation area shall consist of the placement of least four inches of top soil in non‑paved areas and crushed gravel base course in paved areas. Crushed gravel must be mechanically compacted to eight inches depth. Finish grades must conform with surrounding area.

The Contractor is responsible for repairing all site damage outside the tank excavation area as directed by the Project Representative. All debris and excess materials shall be removed from the site, and waste storage areas shall be properly cleaned up and restored. Site utility systems disconnected for tank removal must be completely restored.

If directed by the Project Representative, contractor shall provide repairs to bituminous concrete pavement, concrete walks, sod, seeding, or other site finishes within the tank excavation area. Site finishes shall match existing. Costs for optional site finishes will be paid as an extra based on actual documented costs.

END OF SECTION