

**UNDERGROUND STORAGE TANK REMOVAL  
61 PRINCESS ST., WINNIPEG, MANITOBA**

**THE CITY OF WINNIPEG**

**SPECIFICATIONS**

**PREPARED BY**

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**Part 1            General**

**1.1                TITLE AND DESCRIPTION OF WORK**

- .1            Title of Work: Underground Storage Tank Investigation and Removal
- .2            Background of Work.
  - .1            The work is part of a larger environmental site remediation project whose objective is to address known total petroleum hydrocarbon (TPH) impacts within the soil and groundwater. The site is an active parking lot. Non-invasive investigations have shown evidence of underground storage tanks (UST) and are potential sources of known TPH impacts. The site is located downtown Winnipeg, Manitoba, in a commercial area.
- .3            Description of Work.
  - .1            Confirm Presence of USTs
    - .1            There are two locations where USTs are potentially located below ground as outlined in Site Drawings. Subcontractor is to excavate to confirm either the presence or absence of the USTs.
  - .2            Removal of USTs, Backfill, Site Restoration
    - .1            If presence of USTs is confirmed, Subcontractor to ensure that they are empty, purged and prepared for removal, in accordance with the applicable standard and guidelines.
    - .2            USTs are to be excavated and disposed of off-site by a Licenced Petroleum Technician and in accordance with the applicable standards and guidelines.
    - .3            Confirmation soil sampling and analysis of excavation limits and of backfill material.
    - .4            Backfill excavation with proper compaction in lifts.
    - .5            Apply asphalt cover.
    - .6            While most components of the work are specified in detail, the contractor has been given some latitude to utilize their experience and expertise in choosing materials, devices and methods that will meet the specifications
  - .3            The contracted work covered by these specifications include:
    - .1            Removal of concrete in areas where there is evidence of potential underground storage tanks
    - .2            Investigation of presence of USTs.
    - .3            Ensure USTs are empty and purged.
    - .4            Removal and disposal of USTs.
    - .5            Supply, installation, compaction of backfill.
    - .6            Supply and installation of hard cover.
    - .7            Re-paint parking lot divisional lines as required.
    - .8            Clean Site, remove construction derived waste, and return to previously existing condition.

**1.2 COMPLIANCE WITH REGULATORY AUTHORITY**

- .1 All work to be compliant with local, provincial and national codes and regulations.

**1.3 SCHEDULING**

- .1 Prepare and submit a schedule of activities for the scope of work specified in Earthwork and Related Work – Short Form specifications.
  - .1 Detail any scheduling conflicts which may arise due to any Site areas requiring to be blocked off (if any) during completion of work.
  - .2 Contract Administrator approval required prior to commencement of any Site work.

**1.4 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Work of this Contract comprises the investigation, excavation and site reclamation associated with the removal and disposal of potential USTs, located at 61 Princess St., Winnipeg, MB (Site).

**1.5 EXISTING SERVICES**

- .1 Establish location and extent of service lines in area of work before starting work. Notify Contract Administrator of findings.
- .2 Provide alternative routes for pedestrian and vehicular traffic if necessary.
- .3 Where unknown services are encountered, immediately advise Contract Administrator and confirm findings in writing.
- .4 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .5 Record locations of maintained, re-routed and abandoned service lines.

**1.6 CONTRACT METHOD**

- .1 Construct Work under time and materials contract.

**1.7 WORK BY OTHERS**

- .1 No other subcontractors are expected to be on-Site during the work program; however, if other subcontractors are present on-Site the following apply:
  - .1 Co-operate with other Subcontractors in carrying out their respective works and carry out instructions from Contract Administrator.
  - .2 Co-ordinate work with that of other Subcontractors. If any part of work under this Contract depends for its proper execution or result upon work of another Subcontractor, report promptly to Contract Administrator, in writing, any defects which may interfere with proper execution of Work.

**1.8 SUBCONTRACTOR USE OF PREMISES**

- .1 Subcontractor shall limit use of premises for Work, to allow work by other Subcontractors and use by property owners.
- .2 Co-ordinate use of premises under direction of Contract Administrator.

**1.9 GUARD RAILS AND BARRICADES**

- .1 Provide temporary barriers around excavations as required to perform work and protect the public. Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

**1.10 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy of each document as follows:
  - .1 Health and Safety Plan and Other Safety Related Documents.

**1.11 PERMITS**

- .1 Obtain all necessary Federal, Provincial and Municipal permits required to complete work.
- .2 Submit copies of permits to Contract Administrator in accordance with Section 01 33 00 – Submittal Procedures.

**1.12 ADDITIONAL WORKS**

- .1 Provide unit rates for additional work items/activities as listed on attached Contractor Unit Rates form.
- .2 Add work items/activities not listed on the form, as appropriate.

**1.13 INSPECTION AND DECLARATION**

- .1 Contract Administrator's Inspection: Upon award, Contract Administrator and Subcontractor shall conduct an inspection of Work, identify deficiencies and defects, and Subcontractor will repair as required to conform to Contract Documents.
- .2 Contract Administrator t will be on-Site for all work activities.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1 American Society for Testing and Materials (ASTM)
  - .1 ASTM D 698-91, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft<sup>3</sup>) (600kN-m/m<sup>3</sup>).
- .2 Canadian Council of Ministers of the Environment (CCME)
  - .1 2003 Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Products
  - .2 M.R.188/2001, Storage and Handling of Petroleum Products and Allied Products Regulation

**1.2                MEASUREMENT PROCEDURES**

- .1 Backfill Granular B material will be measured in cubic metres, compacted in-place.
- .2 Asphalt material will be measured in square metres.

**1.3                REGULATIONS**

- .1 Perform all work in accordance with Provincial and Municipal regulations, whichever is more stringent.

**1.4                SUBMITTALS**

- .1 Submittals: in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Contract Administrator prior to commencement of work, Health and Safety Plan in accordance with Section 01 35 29.06 Health and Safety Requirements.
- .3 Submit to Contract Administrator t backfill material sources 2 weeks prior to commencement of work.
- .4 Submit to Contract Administrator all Proctor Analysis test results prior to applying asphalt cover.

**1.5                TESTS AND INSPECTIONS**

- .1 Before commencing work, conduct, with Contract Administrator, condition survey of existing structures, trees and other plants, lawns, fencing, service poles, wires, and paving, survey bench marks and monuments which may be affected by work.
- .2 Do not begin backfilling operations until material has been approved for use by Contract Administrator t.
- .3 Compaction of backfill lifts to be measured in relation to Standard Proctor Dry Density.

## **1.6 BURIED SERVICES**

- .1 Before commencing work establish the location of all buried services on and adjacent to the site and provide Contract Administrator with proof of inspection.
- .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
- .3 Remove obsolete buried services within 2 m of work area.

## **1.7 PROTECTION**

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Contract Administrator's approval.
- .3 Protect existing trees, if present, from damage.
- .4 Protect adjacent existing Site features and/or Site infrastructure from damage.
- .5 Protect buried services that are required to remain undisturbed.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Backfill: Granular B. Source of granular B to be provided to Contract Administrator prior to 2 weeks prior to commencement of excavation.
- .2 Asphalt: Thickness to match existing (15 cm). Type in accordance with Section 32 12 16.01 Asphalt Paving – Short Form.

### **2.2 SITE PREPARATION**

- .1 Saw cut outline is asphalt and/or concrete of excavation areas as outlined in site drawings
- .2 Remove and dispose of sections of asphalt and/or concrete in excavation areas to allow for investigative digging, as required as per the dimensions outlined in Site Drawings and in accordance with Section 02 41 13.14 Asphalt Pavement Removal.

### **2.3 EXCAVATION**

- .1 Excavated shallow depths to determine presence of underground storage tanks.
- .2 Excavate and clear associated plumbing within excavation footprint in accordance with Section 02 65 00 Underground Storage Tank Removal; all tank decommissioning and removal work is to be completed under the supervision of the Contract Administrator and a Licenced Petroleum Technician.
- .3 Ensure tanks are purged via dry ice methodology, as described in Section 02 65 00 Underground Storage Tank Removal, before shipping off-site for proper disposal.

- .4 Facilitate and allow time and coordination for Contract Administrator to collect necessary confirmation soil samples from excavation walls and floor.
- .5 Excavated Soils:
  - .1 Place excavated soil in stock piles in an area designated by Contract Administrator and cover with plastic sheeting.
  - .2 Load excess soil into trucks for off-Site disposal and coordinate transport to an approved facility, if required.
  - .3 Contract Administrator will be responsible for sampling excavated soils prior to removal off-Site, if required.

## **2.4 BACKFILLING**

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Contract Administrator has inspected and approved excavation extents.
  - .2 Contract Administrator has collected required confirmation soil samples from within excavation.
- .2 Remove construction debris, organic soil, and standing water from spaces to be filled.
- .3 No rubble, trash, boulders, or other debris will be allowed as fill material in any usage.
- .4 Placing:
  - .1 Place backfill material in 300 mm lifts.
- .5 Compaction: compact each layer of material using a mechanical compacting device.
  - .1 Compact each lift to density not less than 98% [maximum Standard Proctor dry density] in accordance with ASTM D698. Testing to be completed qualified professional engineer to be arranged for and paid for by Subcontractor. Submit testing results to Contract Administrator.
  - .2 In areas not accessible to rollers, compact to specified density with mechanical tampers.
  - .3 Add water as necessary during compaction to achieve desired density.
  - .4 Conduct proof-rolling using standard roller with 45,400 kg gross mass. Obtain approval from Contract Administrator t when using non-standard rolling equipment.
    - .1 Where proof rolling reveals areas of defective sub-grade, remove and replace in accordance with this section at no extra cost.

## **2.5 SITE RESTORATION**

- .1 Do not apply asphalt cover before compaction testing results have been received and approved by Contract Administrator.
- .2 Grade finished surface to match existing surface type and thickness and in accordance with Section 32 12 16.01 Asphalt Paving – Short Form.
- .3 Re-paint parking lot divisional lines as required, in accordance with Section 32 17 23 Pavement Markings.



**2.6 SHORTAGE AND SURPLUS**

- .1 Supply all necessary fill to meet backfilling requirements.
- .2 Supply all necessary materials to meet paving requirements.
- .3 Dispose of surplus material off-site.

**END OF SECTION**

**Part 1      General**

**1.1          REFERENCES**

- .1      Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2      Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1      Safety Data Sheets (SDS).
- .3      Province of Manitoba
  - .1      The Workers Compensation Act RSM 1987 - Updated 2006.

**1.2          SUBMITTALS**

- .1      Make submittals in accordance with Section 01 33 00 - Submittal Procedures
- .2      Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1      Results of site specific safety hazard assessment.
  - .2      Results of safety and health risk or hazard analysis for site tasks and operation.
- .3      Submit copies of Subcontractor's authorized representative's work site health and safety inspection reports to Contract Administrator.
- .4      Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5      Submit copies of incident and accident reports.
- .6      Contract Administrator will review Subcontractor's site-specific Health and Safety Plan and provide comments to Subcontractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Contract Administrator within 2 days after receipt of comments from Contract Administrator.
- .7      Contract Administrator's review of Subcontractor's final Health and Safety plan should not be construed as approval and does not reduce the Subcontractor's overall responsibility for construction Health and Safety.
- .8      Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Contract Administrator.
- .9      On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**1.3          FILING OF NOTICE**

- .1      File Notice of Project with applicable authorities prior to beginning of Work.

**1.4          SAFETY ASSESSMENT**

- .1      Perform site specific safety hazard assessment related to project

**1.5 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Contract Administrator prior to commencement of Work.

**1.6 REGULATORY REQUIREMENTS**

- .1 Do Work in accordance with applicable Municipal, Provincial, Federal Regulatory Requirements.

**1.7 PROJECT/SITE CONDITIONS**

- .1 Work at site will involve contact with: soil and groundwater potentially impacted with total petroleum hydrocarbons (TPH). Subcontractor Health and Safety Plan should incorporate this likelihood into its scope.

**1.8 GENERAL REQUIREMENTS**

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Contract Administrator may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

**1.9 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

**1.10 COMPLIANCE REQUIREMENTS**

- .1 Comply with The Workers Compensation Act, Workplace Safety Regulation, Manitoba

**1.11 UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Manitoba having jurisdiction and advise Contract Administrator verbally and in writing.

**1.12 POSTING OF DOCUMENTS**

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation Contract Administrator.

**1.13 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative or Contract Administrator.
- .2 Provide Contract Administrator with written report of action taken to correct non-

compliance of health and safety issues identified.

- .3 Departmental Representative or Contract Administrator may stop Work if non-compliance of health and safety regulations is not corrected.

**1.14 POWDER ACTUATED DEVICES**

- .1 Use powder actuated devices only after receipt of written permission from Contract Administrator.

**1.15 WORK STOPPAGE**

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

Part 1 General

**1.1 SECTION INCLUDES**

- .1 Materials and procedures form removal of underground storage tanks.

**1.2 RELATED SECTIONS**

- .1 31 14 11 Earthwork and Related Work – Short Form

**1.3 REFERENCES**

- .1 All applicable Provincial Environmental Regulations
- .2 Manitoba Workplace Safety & Health Act, 1987: as amended.
- .3 Canadian Council of Ministers of the Environment (CCME)
  - .1 CCME PN 1326-(2003), Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products.
  - .2 CCME PN 1299-(2006), Canadian Environmental Quality Guidelines.
    - .1 Chapter 7-[2006], Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.
- .4 Canadian Federal Legislation Canadian Environmental Protection Act (CEPA) 1999, c. 33.
  - .1 Canadian Environmental Assessment Act (CEAA) 1995, c. 37
  - .2 Canada Labour Code (R.S. 1985, c. L-2).
    - .1 Part II (September 2000) – Occupational Health and Safety
  - .3 National Fire Code of Canada, 1995.
  - .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .5 Underwriters’ Laboratories of Canada (ULC)
  - .1 ULC-S603-[2000], Standard for Steel Underground Tanks for Flammable and Combustible Liquids.
  - .2 ULC-S6-I5-[1998], Standard for Reinforced Plastic Underground Tanks for Flammable and Combustible Liquids.

**1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide written storage tank description in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide the following information on storage tank:
  - .1 Former contents.
  - .2 Location.
  - .3 Reason for removal.
- .4 Provide Contract Administrator with a copy of vapour removal test results.
- .5 Forward affidavit of destruction of underground storage tank[s] to authority having jurisdiction.

## 1.5 QUALITY ASSURANCE

- .1 Subcontractor must be licensed/certified by Manitoba authorities having jurisdiction for removal of underground storage tanks.
  - .1 License/certificate, title and number must accompany tender document.
  - .2 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA and applicable Provincial regulations.

## 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Divert metal materials from landfill to metal recycling facility approved by Contract Administrator.
- .2 Segregate and deliver non-salvageable or non-recyclable materials, including waste liquids and sludges to Provincially licensed waste facility.
- .3 Direct waste materials not destined for reuse to provincially approved waste processing Sites for alternative disposal. Certificate of approval required for each facility chosen.
- .4 Manage or dispose of all materials not recycled, salvaged or reused in accordance with applicable Federal, Provincial, and Local Regulations.
- .5 Ensure that materials designated for alternative disposal are delivered to an approved waste processing site.

## Part 2 Products 2.1 Not used.

### 3.1 APPROVALS

- .1 Licensed Petroleum Technician must apply to the local Regional Environmental Office for a Permit to Remove.
- .2 Upon receipt of Permit to Remove, the Licensed Petroleum Technician must provide the Environmental Officer with at least fifteen (15) working days written notification, prior to commencement of work.
- .3 Provide documentation and all site registrations and permits to Contract Administrator.

### PREPARATION SAFETY AND SECURITY

*SPEC NOTE: Workers should be extra cautious when working in areas of flammable liquids and vapours, and in confined spaces. Smoking is prohibited except in designated safe areas.*

- .4 Conform to or exceed Federal, Provincial and Territorial codes, local municipal by-laws, by-laws, and codes and regulations of utility authorities having jurisdiction.
- .5 Protection:
  - .1 Meet safety requirements of Occupational Safety and Health, Canada Labour Code Part II and Regulations for Construction Projects.
  - .2 Disconnect or remove source of ignition from vicinity of tank.
  - .3 Provide temporary protection for safe movement of personnel and vehicle traffic.

- .4 Cut, braze or weld metal only in monitored areas established to be free of ignitable vapour concentrations.
- .5 Ground and bond metal equipment, including tanks and transfer pipes, before operating equipment or transferring flammable materials.
- .6 Use non-sparking tools and intrinsically safe electrical equipment.
- .7 Smoking is not permitted.
- .6 Prepare a Health and Safety Plan for submission to the Contract Administrator.

### 3.2 DRAINING

- .1 Drain and flush piping into tank.
- .2 Pump out liquid from tank
  - .1 Use explosion proof, air driven or hand pump.
- .3 Remove sludge from tank bottom.
  - .1 Dispose of product and sludge in accordance with local, and Provincial regulations using waste disposal carrier licensed by Provincial Environmental Agency having jurisdiction.

### 3.4 EXCAVATION TRENCHING AND BACKFILL

- .1 Do work in accordance with Section 31 14 11 – Earthwork and Related Work – Short Form
- .2 Provide protective material around excavation.
- .3 Provide constant supervision during excavation and backfilling.
- .4 Excavation
  - .1 Excavate until top of tank and connections and openings are exposed.
  - .2 Disconnect piping:
    - .1 Remove fill tube.
    - .2 Disconnect fill gauge, product and vent lines.
    - .3 Cap or plug open ends of lines that are not to be used further.
    - .4 Remove piping from ground.
  - .3 Temporarily plug tank openings.
  - .4 Continue excavation until tank is completely exposed.
  - .5 Temporarily stockpile on site soil in vicinity of tank, until waste classification can be established prior to final disposal.
- .5 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, and adjacent grades. Provide bracing and shoring as required.

### 3.4 TANK REMOVAL

*SPEC NOTE: Before vapour removal measures are undertaken, it is normally necessary' to remove the tank from the ground because any product that may have leaked into the ground could re-enter the tank. Extreme caution should be used.*

- .1 Remove tank in accordance with CCME Code of Practice PN 1326 and/or applicable provincial standards and regulations, and place in secure location.

- .2 Block tank to prevent movement.
- .3 Contact Contract Administrator immediately if there is evidence of contamination in tank excavation, stop Work until further notice.
- .4 Remove and replace contaminated soil and accumulated flammable or combustible liquid with clean fill common to local area in accordance with Section 31 14 11- Earthwork and Related Work – Short Form.

### 3.5 VAPOUR REMOVAL

- .1 Purging:
  - .1 Purge vapours to less than 10% of lower explosive limit (LEL).
  - .2 Verify with combustible gas metre.
- .2 Inverting:
  - .1 Displace oxygen to levels below necessary to sustain combustion.
  - .2 Verify with combustible gas metre.
- .3 Water Method:

*SPEC NOTE: If tank overflows purged product may escape. Hence all normal safety and pollution precautions regarding flammable, hazardous or toxic liquids and vapours must be taken throughout vapour removal process.*

- .1 Fill tank with water to expel vapours.
  - .2 Remove and dispose of contaminated water in accordance with regulations after tank is removed from site.
  - .3 Verify with combustible gas metre.
- .4 Dry Ice Method:

*SPEC NOTE: Tank vapours will flow out of tank as ice vapourizes and may surround the area. All safety precautions regarding flammable, hazardous or toxic vapours should be taken throughout vapour removal process.*

- .1 Add 1.85 gram of solid carbon dioxide (dry ice) for each 100 L capacity.
  - .2 Crush and distribute ice evenly over greatest area to secure rapid evaporation. Avoid skin contact.
  - .3 Verify dry ice has vapourized.
- .5 Air Method:

*SPEC NOTE: While ventilating, flammable, hazardous or toxic vapour precautions should be taken throughout vapour removal process.*

- .1 Ventilate tank with air using small gas exhauster operated with compressed air.
  - .2 Air to enter opening at one end and to exit opening at other end to quickly remove vapour.
  - .3 Test interior of tank to determine when tank is free of vapour.



### **3.6 CAPPING**

- .1 Plug holes after tank has been freed of vapours and before tank is moved from site.
- .2 Leave vent[s] open.
- .3 Plug corrosion leak holes using screwed (boiler) plugs.
- .4 Leave 3 mm vent hole in one plug to prevent tank from being subjected to excessive pressure differential caused by extreme temperature change.

### **3.7 SECURING AND REMOVAL FROM SITE**

*SPEC NOTE: Tanks should be removed from premises as promptly as possible after vapour removal. If tank remains at site overnight or longer, vapour may be released from scale or sludge in tank.*

- .1 Check vapour levels prior to transport:
  - .1 Remove vapour if required.
- .2 Dispose of tank in accordance with local, Provincial, or Federal regulations.
- .3 Truck removal:
  - .1 Secure tank on truck for transport to disposal site.
  - .2 Cut suitable openings in tank sides to render tank unusable.
  - .3 Ensure 3 mm vent hole located at uppermost point on tank.

### **3.8 SITE REMEDIATION**

- .1 To CCME PN 1299.
- .2 Repair/replace finish grade to match surrounding area, including but not limited to sods as specified in Section 31 14 11- Earthworks and Related Work – Short Form
- .3 Prepare tank closure report containing results of soil sampling analysis to determine level and extent of hydrocarbon contamination.

### **3.9 WORKMANSHIP AND DISPOSAL**

- .1 Tanks destined for disposal:
  - .1 Dismantle, cut sufficient openings or otherwise render unusable.

### **3.10 PROJECT COMPLETION**

- .1 A Work Completion Certificate shall be submitted by Subcontractor within ten 10 working days of project completion.
- .2 A Tank Removal Report shall be submitted by Subcontractor within ninety 90 calendar days of project completion.

**END OF SECTION**

**Part 1 General**

**1.1 SECTION INCLUDES**

- .1 Methods of removal of existing asphalt pavement.

**1.2 MEASUREMENT PROCEDURES**

- .1 Removal of existing asphalt pavement will be measured in square metres of surface actually removed regardless of depth removed or number of operations required.
- .2 Payment under this item will include operations involved in removing, hauling and stockpiling designated pavement and cleaning of remaining pavement surface.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling.
- .2 Divert unused asphalt materials from landfill to local facility approved by Contract Administrator.

**Part 2 Products**

**2.1 EQUIPMENT**

- .1 Use cold milling, planning or grinding equipment with automatic grade controls capable of operating from stringline, and capable of removing part of pavement surface to depths or grades indicated

**Part 3 Execution**

**3.1 PREPARATION**

- .1 Prior to beginning removal operation, inspect and verify with Contract Administrator areas, depths and lines of asphalt pavement to be removed.

**3.2 PROTECTION**

- .1 Protect existing pavement not designated for removal, light units and structures from damage. In event of damage, immediately replace or make repairs to approval of Contract Administrator at no additional cost.

**3.3 REMOVAL**

- .1 Remove existing asphalt pavement to lines and grades as indicated by Contract Administrator in field.
- .2 Use equipment and methods of removal and hauling which do not damage or disturb underlying pavement.
- .3 Prevent contamination of removed asphalt pavement by topsoil, underlying gravel or other materials.
- .4 Provide for suppression of dust generated by removal process.

**3.4 STOCKPILING OF MATERIAL**

- .1 Dispose of removed asphalt pavement by stock-piling in location[s] designated by Contract Administrator.
- .2 Removed asphalt pavement which is to be recycled in hot mix asphalt concrete under this contract may be stockpiled at designated asphalt plant site.

**3.5 FINISH TOLERANCES**

- .1 Finished surfaces in areas where asphalt pavement has been removed to be within +/-5 mm of grade specified but not uniformly high or low.

**3.6 SWEEPING**

- .1 Sweep remaining asphalt pavement surfaces clean of debris resulting from removal operations using rotary power brooms and hand brooming as required.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED SECTION**

- .1 Section 01 33 00 -Submittal Procedures

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM D698-[00a], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600) kN-m/m<sup>3</sup>) .
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB – 1.5 – [M91 (March 1999)], Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).
  - .2 CAN/CGSB – 1.74 – (2001), Alkyd Traffic Paint.
- .3 Ontario Provincial Standard Specifications (OPSS)
  - .1 OPSS 302 - [April 1999], Construction Specification for Primary Granular Base.
  - .2 OPSS 310 - [March 1993], Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving and Hot Mix Patching.
  - .3 OPSS 1010 - [March 1993], Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.
  - .4 OPSS 1103 - [February 1996], Material Specification for Emulsified Asphalt.
- .4 Manitoba Standard Construction Specifications (MSCS)
  - .1 MSCS 805(1) – [February 2017], Applying Prime Coat, Blotter Sand and Tack Coat.

### **1.3 SAMPLES**

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

### **1.4 WASTE MANAGEMENT AND DISPOSAL**

*SPEC NOTE ENVIRONMENT: The disposal of packaging waste into landfill site demonstrates an inefficient use of natural resources and consumes valuable landfill space.*

- .1 Separate and recycle waste materials as applicable.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, and packaging material for recycling.
- .4 Place materials defined as hazardous or toxic in designated containers.

- .5 Divert unused aggregate materials from landfill to facility for reuse as approved by Contract Administrator.
- .6 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Contract Administrator.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.
- .9 Divert unused asphalt from landfill to facility capable of recycling materials.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Aggregates:
  - .1 Granular A.
  - .2 Granular B Type I.
- .2 Prime coat: MTO Primer, RC-30 or SS-1 to MSCS 805(1).
- .3 Tack coat: SS-1 to MSCS 805(1).
- .4 Traffic paint: yellow and white to CAN/CGSB-1.74.
- .5 Paint thinner: to CAN/CGSB-1.5.

## **Part 3 Execution**

### **3.1 FOUNDATIONS**

- .1 Foundations for roadways comprise:
  - .1 300 mm compacted thickness of granular subbase B.
  - .2 150 mm compacted thickness of granular base A.
- .2 Foundations for parking lots to comprise:
  - .1 300 mm compacted thickness of granular base A.
- .3 Compaction: compact each lift of granular material to 100% Standard Proctor density to ASTM D698. Maximum lift thickness: 150 mm.

### **3.2 PAVEMENT THICKNESS**

- .1 Pavements for roadways:
  - .1 Base course: 50 mm HL8 or MB2.
  - .2 Wear course: 40 mm HL3 or MB5].
- .2 Pavements for parking lots:

- .1 Wear course: 50 mm HL3 or MB5.

**3.3 TRAFFIC MARKINGS**

- .1 Paint parking space divisions and other pavement markings in accordance with manufacturers recommendations and as indicated.
- .2 Use paint thinner in accordance with manufacturer's requirements.

**END OF SECTION**

## **Part 1**

### **1.1 General**

#### **RELATED REQUIREMENTS**

#### **1.2 MEASUREMENTFORPAYMENT**

- .1 Pavement marking: measured in metres of solid lines or painted length of dash lines.
- .2 Pavement marking including reflective glass beads: measured in metres of solid lines or painted length of dash lines.
- .3 Supply of paint: measured in litres.
- .4 Supply of reflective glass beads: measured in kilograms.
- .5 Symbols and letters: measured in metres.

#### **1.3 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.5-[99], Low Flash Petroleum Spirits Thinner.
  - .2 CAN/CGSB 1.74-(01), Alkyde Traffic Paint.
- .2 Green Seal Environmental Standards (GS)
  - .1 GS-11-(2008, 2nd Edition), Paints and Coatings.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Safety Data Sheets (SDS)
- .4 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual – current edition.

#### **1.4 ACTION AND INFORMATION SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data Pavement Markings
  - .1 Upon Contract award, Subcontractor to submit to Contract Administrator [two] copies of WHMIS SDS in accordance with Health and Safety Requirements

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's

written instructions.

- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Paint:
  - .1 To MPI -EXT 2.1 B, Alkyd zone/traffic marking.
  - .2 Paints: in accordance with MPI recommendation for surface conditions.
    - .1 Paints: maximum VOC limit 100 g/L to GS-II.
  - .1 Colour: to MPI listed, yellow, black, white, as required.
- .2 Thinner: to MPI listed manufacturer.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates and surfaces to receive pavement markings previously installed under other Sections or Contracts are acceptable for product installation in accordance with MPI instructions prior to pavement markings installation.
- .2 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.
- .3 Proceed with Work only after unacceptable conditions have been rectified.

### **3.2 EQUIPMENT REQUIREMENTS**

- .1 Paint applicator: approved pressure type with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at specified rates, and to dimensions as indicated.



### **3.3 TRAFFIC CONTROL**

- .1 Set up required barriers in accordance with Section 01 56 00 Temporary Barriers and Enclosures.

### **3.4 APPLICATION**

- .1 Lay out pavement markings.
- .2 Unless otherwise approved by Contract Administrator, apply paint only when air temperature is above 10 degrees C, wind speed is less than 60 km/h and no rain is forecast within next 4 hours.
- .3 Apply traffic paint evenly at rate of 3 m<sup>2</sup>/L.
- .4 Do not thin paint unless approved Contract Administrator.
- .5 Symbols and letters to dimensions indicated.
- .6 Paint lines: of uniform colour and density with sharp edges.
- .7 Thoroughly clean distributor tank before refilling with paint of different colour.

### **3.5 TOL ERANCE**

- .1 Paint markings: within plus or minus 12 mm of dimensions indicated.

### **3.6 CLEANING**

- .1 Progress Cleaning:
  - .1 Leave Work area clean at end of each day.

### **3.7 PROTECTION OF COMPLETED WORK**

- .1 Protect pavement markings until dry.
- .2 Repair damage to adjacent materials caused by pavement marking application.

**END OF SECTION**

## **1.1 SECTION INCLUDES**

- .1 Barriers.
- .2 Traffic Controls.
- .3 Fire Routes.

## **1.2 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 1.189M-[84], Primer, Alkyd, Wood, Exterior.
  - .2 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-O121-[M1978], Douglas Fir Plywood.

## **1.3 INSTALLATION AND REMOVAL**

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

## **1.4 HOARDING**

- .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically flush and butt jointed.
- .3 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CGSB 1.189M and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .7 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

## **1.5 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

**1.6 ACCESS TO SITE**

- .1 Provide and maintain, as required, access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

**1.7 PUBLIC TRAFFIC FLOW**

- .1 Provide and maintain, as required, competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

**1.8 FIRE ROUTES**

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

**1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

**1.10 PROTECTION OF BUILDING FINISHES**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Contract Administrator locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1        Section 31 14 11- Earthwork and Related Work Short Form.

**1.2                ADMINISTRATIVE**

- .1        Submit to Contract Administrator submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2        Do not proceed with Work affected by submittal until review is complete.
- .3        Review submittals prior to submission to Contract Administrator. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents.
- .4        Notify Contract Administrator in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .5        Verify field measurements and affected adjacent Work are co-ordinated.
- .6        Subcontractor's responsibility for errors and omissions in submission is not relieved by Contract Administrator 's review of submittals.
- .7        Subcontractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Contract Administrator review.
- .8        Keep one reviewed copy of each submission on site.

**1.3                SHOP DRAWINGS AND PRODUCT DATA**

- .1        The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contract Administrator to illustrate details of a portion of Work.
- .2        Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .3        Allow 3 days for Contract Administrator's review of each submission.
- .4        Adjustments made on shop drawings by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator prior to proceeding with Work.

- .5 Make changes in shop drawings as Contract Administrator may require, consistent with Contract Documents. When resubmitting, notify Contract Administrator and City of Winnipeg in writing of revisions other than those requested.
- .6 Accompany submissions with transmittal letter containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .7 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.
    - .3 Manufacturer.
  - .4 Details of appropriate portions of Work as applicable:
    - .1 Fabrication.
    - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
    - .3 Setting or erection details.
    - .4 Capacities.
    - .5 Performance characteristics.
    - .6 Standards.
    - .7 Operating weight.
    - .8 Single line and schematic diagrams.
    - .9 Relationship to adjacent work.
- .8 After Contract Administrator's review, distribute copies.
- .9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Contract Administrator may reasonably request.
- .10 Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Contract Administrator where shop drawings will not be prepared due to standardized manufacture of product.
- .11 Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Contract Administrator.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.

- .12 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Contract Administrator.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.
- .13 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Contract Administrator.
- .14 Delete information not applicable to project.
- .15 Supplement standard information to provide details applicable to project.
- .16 If upon review by Contract Administrator, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .17 Review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review shall not mean that the City of Winnipeg approves detail design inherent in shop drawings, responsibility for which shall remain with Subcontractor submitting same, and such review shall not relieve Subcontractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Subcontractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

#### **1.4 SAMPLES**

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Contract Administrator's business address.
- .3 Notify Contract Administrator in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Adjustments made on samples by Contract Administrator are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Contract Administrator and City of Winnipeg prior to proceeding with Work.
- .5 Make changes in samples which Contract Administrator may require, consistent with Contract Documents.
- .6 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.



**END OF SECTION**

# **DRAWINGS**



**Legend**

- - - - - - Site Boundary
- - - - - - Property Line

<b>Title: APPROXIMATE LOCATIONS OF POTENTIAL UNDERGROUND STORAGE TANKS</b>	
	<b>Project:</b> <b>REMEDIATION ACTION PLAN - TANK PULL SPECS 61 PRINCESS STREET WINNIPEG, MANITOBA</b>
<b>Date:</b> <b>July 2018</b>	<b>Client:</b> <b>THE CITY OF WINNIPEG</b>
<b>Updated:</b> <b>Jul 30, 2018</b>	
	<b>DRAWING 1</b>