



# City of Tampa

*Jane Castor, Mayor*

## Contract Administration Richard Mutterback, Director

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### ADDENDUM 2

Via E-Mail

DATE: July 17, 2023

Contract: 22-C-00046; Northwest Ground Storage Tank Improvements

Bidders on the above referenced project are hereby notified that the following addendum is made to the Contract Documents. BIDS TO BE SUBMITTED SHALL CONFORM TO THIS NOTICE.

Item 1: The Bid Opening date is hereby changed to July 25, 2023.

Item 2: Site visits will not be permitted.

Item 3: Clarification – Per specifications, warranty shall be two years for workmanship and coating, one year for mechanical equipment.

Item 4: Remove – “Morris Bridge East GST”. Only NW GST is to be included in this bid.

Item 5: The N140 is NSF compliant when used as a primer at 2-4 mils and top coated with the 264. See attached revised specification. Alternatively, Tnemec Series 21 or 1220 at 8-20 mils in 1 or 2 applications may also be acceptable. For the resurfacer, See section 3.07 C. The coating manufacturer recommends the resurfacer.

Item 6: See Section 3.07 for the specifications for surface preparation of concrete. The as needed is for any areas that are crack repaired and any exposed concrete. The intent is apply one coat to the exterior except for the above mentioned areas.

Item 7: Investigation beneath tank floor shall include all labor, materials, and equipment to investigate the condition of the soil beneath the tank floor to verify if there are any voids from leaks via GPR. The previous investigation beneath the tank floor of the Morris Bridge West GST is attached for reference.

All other provisions of the Contract Documents and Specifications not in conflict with this Addendum shall remain in full force and effect. Questions are to be e-mailed to [ContractAdministration@tampagov.net](mailto:ContractAdministration@tampagov.net).

*Jim Greiner*

Jim Greiner, P.E., Contract Management Supervisor

**SECTION 09920  
TANKS FINISHES REHABILITATION**

**PART 1 - GENERAL**

1.01 WORK INCLUDED

- A. Furnish all labor, materials, and equipment necessary to perform the coating rehabilitation of the exterior concrete spot repairs, interior concrete and metal piping and appurtenances of the NW Pumping Station ground storage tank and the exterior and interior coatings ~~of the East ground storage tank located at the Morris Bridge Pump Station~~ as described in the Drawings, Notes and these specifications.
- B. The work involves surface preparation of concrete, ductile iron pipes and fittings, carbon steel, cast steel and non-ferrous metals including aluminum and galvanized steel surfaces as indicated on the tank drawings and painting notes.
- C. Surface preparation and coating application will not be performed until concrete repairs are performed.
- D. Prepare concrete surfaces by high pressure water cleaning (HPWC) abrasive blast cleaning and power tools as needed to prepare for coating application
- E. Interior metal surfaces to be painted shall have existing coatings, scale and corrosion products fully removed and coated as required herein using products suitable for contact with potable water.
- F. Exterior metal surfaces to be coated shall be prepared on a spot and area basis to remove cracked, peeling, delaminating and blistered coating. Surfaces to be painted will be spot coated with a primer and receive a spot application of finish coat.
- G. Perform or obtain an asbestos survey prior to mobilizing. Perform lead based paint survey immediately after draining the tank.

1.02 REFERENCES

- A. American Society for Testing and Materials (ATM)
  - 1. ASTM E337, Standard Test Method for Measuring Humidity with a Psychrometer
  - 2. ASTM F1869, “Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”.
  - 3. ASTM D4138, Standard Test Method for Measurement of Dry Paint Thickness of Protective Coating Systems by Destructive Means
  - 4. ASTM D4258, “Standard Practice for Surface Cleaning Concrete for Coating”.
  - 5. ASTM D4259, “Standard Practice for Abrading Concrete”.
  - 6. ASTM D4263, “Standard Test Method for indicating Moisture in Concrete by the Plastic Sheet Method”.

7. ASTM D4285, Standard Test Method for Indicating Oil or Water in Compressed Air
  8. ASTM D4414, Standard Practice for Measurement of Wet Film Thickness by Notch Gages
  9. ASTM D 4417 Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
  10. ASTM D5402, Standard Test Methods for assessing the Solvent Resistance of Organic Coatings Using Solvent Rubs
  11. ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- B. American Water Works Association (AWWA)
1. AWWA D102 - Standard for Painting Steel Water Storage Tanks
  2. ANSI AWWA D110-04 Wire-Strand-Wound Circular Pre-Stressed Concrete Water Tanks
- C. International Concrete Repair Institute (ICRI)
1. Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays- Guideline No. 03732
- D. National Association of Pipe Fabricators, Inc. (NAPF)
1. NAPF 500-03- Surface Preparation Standard for Ductile Iron Pipe and Fittings in Exposed Locations Receiving Special External Coatings and/or Special Internal Linings.
    - a. NAPF 500-03-01 Surface Preparations Standard for "Solvent Cleaning"
    - b. NAPF 500-03-03 Power Tool Cleaning
    - c. NAPF 500-03-05 Surface Preparations Standard for "Abrasive Blast Cleaning of Cast Ductile Iron Fittings"
- E. SSPC: The Society for Protective Coatings
1. SSPC- PA-1 - Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel
  2. SSPC-PA-2 - Procedure for Determining Conformance to Dry Coating Thickness Requirements.
  3. SSPC - PA-3 - Paint Application Guide for Safety in Paint Application.
  4. SSPC Technology Guide No. 6
  5. SSPC-SP 6/NACE No. 3 - Joint Surface Preparation Standard SSPC- SP 6/NACE No. 3: Commercial Blast Cleaning
  6. SSPC-SP 10/NACE No. 2 - Joint Surface Preparation Standard SSPC- SP 10/NACE No. 2: Near-White Blast Cleaning
  7. SSPC-SP 15 - Surface Preparation Specification No. 15: Commercial Grade Power Tool Cleaning to Bare Metal

8. SSPC-SP WJ-4/NACE WJ-4 -Waterjet Cleaning of Metals—Light Cleaning
  9. SSPC-SP 13/NACE No. 6 - Surface Preparation of Concrete
  10. SSPC -VIS-1 - Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blasting.
  11. SSPC-VIS 3 - Guide and Reference Photographs for Steel Surfaces Prepared by Power and Hand Tool Cleaning. /
- F. NACE International; (National Association of Corrosion Engineers International)
1. NACE SP -0188 - “Holiday” Detection Standard.
- G. NSF International (National Sanitation Foundation International) (NSF)
1. NSF/ANSI 61 Coatings and Linings
  2. NSF/ANSI/CAN 61
- H. National Lead Laboratory Accreditation Program (NLLAP)
- I. National Emissions Standards for Hazardous Air Pollutants (NESHAP)
- J. Where reference is made to one of the above or other referenced standards, the revisions in effect at the time of bid opening shall apply.

#### 1.03 QUALITY ASSURANCE

- A. Contractor shall have at least ten years’ experience in the field of water tanks cleaning and tanks painting, being of comparable type and scale. Coating material shall have been used on similar projects successfully for a minimum of five years, being of comparable type and scale.
- B. Only one coating manufacturer shall supply the coating materials. No intermixing of products between manufacturers shall be permitted.
- C. The coating materials shall be applied in strict accordance with the coating manufacturer's written recommendations unless more stringent requirements are specified.
- D. Throughout the duration of the work, the Contractor shall provide the Owner (or Owner’s Representative) with safe and reasonable access to conduct its own Quality Assurance and hold point inspections of the work performed by the Contractor.
- E. Contractor shall provide for the Engineer all necessary rigging and safety gear required to complete the inspection and testing operations. The Contractor shall assist the Engineer in making all required quality assurance tests and inspections. Each step of the construction is subject to approval by the Engineer prior to proceeding with a subsequent step.
- F. The Contractor shall afford representatives of the Local, State, and Federal agencies having authority, every reasonable, safe, and proper access for observation of the work done or being done at the site at all times.
- G. No coating work shall be done if the ambient temperatures (air, coating material and substrate) are not within the ranges allowed by the coating manufacturer. The

Contractor shall control the interior conditions through use of effective dehumidification and ventilation equipment.

- H. The Contractor shall provide a Quality Control Inspector that has taken and successfully completed a Coating Inspector Training Class and has a minimum of two-year's experience in performing and reporting on quality control inspections.
- I. The Contractor shall erect and maintain containment systems surrounding the work to contain emissions of dust, debris, and overspray. Working platforms and containments, cables, and other supporting structures shall be designed to support the workers, Owner's Representatives, spent surface preparation media, and equipment according to OSHA regulations. If containment is to be attached to the structure, bolting shall attach the containment, clamping, or similar means.
- J. Welding or drilling into the structure is prohibited.
- K. The Contractor shall provide drawings showing the containment system and indicate the method(s) of supporting the working platform and containment materials.
- L. If erecting a structural containment, the Contractor shall submit calculations and drawings, signed and sealed by a structural engineer licensed in the state of Florida, that assure the structural integrity of the containment structure.
- M. Engineer review and acceptance of the drawings and calculations shall not relieve the Contractor from the responsibility for the safety of the working platforms and containment, and for providing ample ventilation to control worker and environmental exposures. After the work platforms and containment materials are erected additional measures may be needed to ensure worker safety according to OSHA regulations. The Contractor shall apply such measures at no additional cost to the Owner.

#### 1.04 QUALITY CONTROL AND INSPECTION OF WORK

- A. The Contractor is responsible for conducting Quality Control Inspections for all phases of the work.
- B. Prepare a Quality Control Plan including all inspection tasks to be performed, inspection equipment and test methods to be employed, acceptance criteria and inspection report forms for approval by the Owner. Include the qualifications, certifications and experience of the Quality Control Inspector(s)
- C. All tests, measurements and inspections shall be documented daily. Provide signed inspection reports to the Engineer on a weekly basis, or more frequently if requested.
- D. It is the Contractor's responsibility to maintain an updated progress schedule and coordinate with the Owner/ Engineer when an area is ready for hold point inspections. No work further work in that area will be allowed until the Owner and Engineer have approved the work performed.
- E. Deficient areas such as pinholes, holidays, embedded contamination, sags, mechanical damage, high / low mils, shall be repaired to meet the requirements of this specification.
- F. The Owner can stop the job if the Contractor is deviating from the specifications.

- G. The Contractor shall afford representatives of the Local, State, and Federal agencies having authority, every reasonable, safe, and proper access for observation of the work done or being done at the site at all times.

1.05 EXISTING COATING AND STRUCTURE SURVEY

- A. The contractor shall perform or obtain an asbestos survey per NESHAP regulations, immediately after draining the tank.
- B. The Contractor shall perform lead based paint survey per NLLAP requirements, immediately after draining the tank.

1.06 TEST EQUIPMENT FURNISHED BY CONTRACTOR

- A. The Contractor will have, at a minimum, the following calibrated test equipment available on site for use by the Engineer during the progress of the work:
  - 1. Sling Psychrometer
  - 2. Surface Temperature Gauge
  - 3. Continuous monitor for recording interior temperature and humidity during coating application and initial coating cure.
  - 4. Wet Film Thickness Gauge
  - 5. Dry Film Thickness Gauge for Concrete
  - 6. Dry Film Thickness Gauges for ferrous and non- ferrous metals.
  - 7. National Bureau of Standards thickness plates.
  - 8. SSPC VIS-1 and VIS-3- Pictorial Surface Preparation Standard
  - 9. Holiday Detector. Low voltage type such as Tinker & Razor Model M-1, Series 9533
  - 10. Holiday Detector. High voltage type such as DE Stearns 14/20 High Voltage Holiday Detector
  - 11. Micrometer and replica tape for measuring anchor profile per ASTM D 4417 Method C.
  - 12. ICRI Surface Profile Plates for verify concrete texture.

1.07 CONTRACTOR FURNISHED INFORMATION

- A. The following information will be recorded on daily inspection reports as a minimum:
  - 1. Contractor Name, Project, Date, Inspection Report Number, Quality Control Inspector, Owner, Engineer, Work Start and End Times
  - 2. Surface preparation and coating application equipment used.
  - 3. Materials:
    - a. Abrasive used: (Size, Type, Source, Cleanliness)
    - b. Compressed air cleanliness

- c. Coatings applied: (Coat, Type, Manufacturer, Batch No., other information deemed necessary.
  - d. Coating Mixing (Thinners: Type, Manufacturer, Batch No., induction period, pot life and other information deemed necessary.)
  - e. Grouts and sealants: Type, Manufacturer, and other information deemed necessary.
- 4. Surfaces cleaned, surfaces coated and surfaces inspected
  - 5. Surface preparation cleanliness specified and cleanliness achieved.
  - 6. Anchor profile specified and anchor profile achieved
  - 7. Coat applied, color, start and stop application times
  - 8. Dry film thickness measurements required and dry film thickness measured
  - 9. Surfaces requiring rework
  - 10. Contractor Personnel on site including,
    - a. Name, Address, and Phone Number of Supervisor.
    - b. Name, Address, and Phone Number of Foreman.
    - c. Name, Address, and Phone Number of Quality Control Inspector=
    - d. Name of each Crewmember or Laborer.

1.08 CONTRACTOR REQUEST FOR INSPECTION

- A. The Contractor will notify the Engineer, in writing, a minimum of 24 hours in advance for hold point inspections and will assist the Engineer in making all necessary tests and inspections.
- B. No rigging and/or staging shall be removed before required hold point inspection and approval is made. The Contractor shall assist the Engineer in the use and operation of all equipment for access.
- C. The Contractor will make all necessary rigging available to the Engineer and assist in the operation of rigging during all testing operations.
- D. Approval by the Engineer of an area does not release the Contractor from providing the quality and workmanship provided by this Specification.

1.09 COATING THICKNESS AND CONTINUITY

- A. The specified coverage rates of the coatings are minimums. The first coat on metal surfaces refers to the first paint coat and not to conditioning or other pretreatment applications. Coating shall be applied to the thickness specified, and in accordance with the coating manufacturer recommendations.
- B. After each coat has been allowed to dry, the dry film thickness will be measured and recorded. The Contractor shall not apply a successive coat until the dry film thickness of the preceding coat or coats has been approved by the Engineer.
- C. Coating system thickness is the total thickness of all the required coats of paint and does not include passivators or sealers.

- D. Measurement of dry paint thickness over metal surfaces will be done in accordance with SSPC-PA-2, Level 2 (minimum as specified, maximum up to 120% of the maximum specified).

1.10 HOLIDAY TESTING:

- A. All interior tanks coating work on metal and concrete surfaces shall be holiday tested for discontinuities such as pinholes, missed and skipped areas, using a low voltage holiday tester. The Contractor shall furnish Holiday Detectors for the testing. Testing shall be done in accordance with NACE SP0188, Discontinuity (Holiday) Testing of Protective Coatings.
- B. Holiday tests shall not be performed until the finish coat has cured sufficiently that it can be handled without damage, and water will not have a detrimental effect on the coating. Holidays shall be repaired in accordance with the coating manufacturer recommendations and then retested.
- C. The Contractor shall perform the holiday test in the presence of the Engineer

1.11 DELIVERY, STORAGE, AND HANDLING

- A. All coating materials and components shall be delivered to the jobsites in the original, unopened containers, plainly marked with the manufacturer's original labels. Protect materials from freezing and over-heating during shipment.
- B. Store materials not in use in tightly covered containers, in well-ventilated areas with ambient temperatures continuously maintained within the range recommended by the coating manufacturer.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.
- C. Comply with requirements listed on the manufacturer's Material Safety Data Sheets and all health, fire, EPA and OSHA regulations as regards storage materials.
- D. All coating materials shall be protected from direct sunlight and stored in a separate structure provided by the Contractor. The structure shall be constructed of non-combustible materials.
- E. The Contractor shall be solely responsible for the protection of all the material stored by him at the job site.
- F. All coating materials at the job site shall be subject to inspection.
- G. An approved environmental paint spill kit and container shall be located near the paint storage and mixing areas.
- H. Mixing
  - 1. Mechanical mixers shall be used to mix the coating and coating components in accordance with the coating manufacturer's written instructions. Do not mix partial kits of coating. Containers used for mixing shall be clean and dry. Mixed materials that are not used prior to expiration of the pot life shall be discarded.



2. All coatings materials shall be mixed and thinned in the presence of the Engineer.
3. An appropriate type of fire extinguisher shall be kept in the mixing area.

#### 1.12 SUBMITTALS

- A. Submit the following in accordance with Section 01300. Shop drawings shall consist of manufacturer's cuts or catalogs including descriptive literature and complete characteristics, and code requirements.
  1. Furnish color charts for the interior and exterior primers and topcoat.
  2. A plan for providing adequate ventilation during abrasive blast cleaning, application and curing of coatings in the interior of the tanks.
  3. Provide references to Owner and Engineer for coating material successfully used on similar projects.
- B. Submit a Quality Control Plan per 1.04 B.
- C. Submit the following samples for each type of coating system and in each color and gloss of finish coat indicated.
  1. Color cards for initial finish coat color selections.
- D. Three sets of eight inch by eight-inch samples, on 1/4-in hardboard, of all coats and colors for interior and exterior application with a two-inch band of each coat exposed in step-down fashion. Resubmit until approved.
- E. For each primer, intermediate, and finish coating the Contractor shall provide the Manufacturer's published product data sheet (PDS) or technical data sheet (TDS) and application instructions. Supplement with any of the data listed below if it is not included on the PDS or TDS.
  1. Manufacturer's name, type of paint, brand name, brand code, VOC, volume solids, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and thinning.
  2. Surface preparation recommendations for each substrate to be coated.
  3. Primer, intermediate, and finish coating, pot life and specific mixing instructions.
  4. Minimum and maximum dry and wet film thickness per coat.
  5. Minimum and maximum curing time between coats including atmospheric conditions for each.
  6. Curing time before submergence in liquid.
  7. Thinner and thinning ratios to be used with each paint.
  8. Ventilation requirements.
  9. Allowable atmospheric conditions during which the paint may be applied, including ambient temperature, relative humidity and surface temperature.

10. Allowable applications methods.
  11. Maximum allowable moisture content of surface to be painted.
  12. Maximum storage life.
  13. Manufacturer's certification that painting materials are in accordance with the appropriate reference standards.
  14. Material safety data sheets and cautions concerning health hazards.
- F. The Contractor shall submit to the Engineer a plan for removal/disposal of cleaning and wash down waters.

#### 1.13 COLOR SELECTION

- A. All exterior finish coat colors are selected by the Owner.
- B. Each coat applied shall be of a contrasting color
- C. Interior final coats shall be white
- D. The Contractor shall submit a color chart, from the specified coating manufacturer to the Owner to verify a color for the exterior portions of the tanks. The Owner shall submit their choice to the Contractor in writing before application of coatings.

#### 1.14 DAMAGE CLAIMS

- A. The Contractor shall be responsible for all damages that may be caused by the painting and cleaning operations or any portion of the Work, to surrounding property.
- B. The Contractor shall delegate a responsible and authorized contact person (name, address, phone number, etc.) to address all claims that arise from damage caused by their painting, incidental or not.

#### 1.15 CERTIFICATION

- A. Provide certification signed by supplier of the coating attesting that coating system proposed meets the specifications.

#### 1.16 JOB CONDITIONS

- A. Volatile Organic Compounds (VOC) - VOC ratings (pounds per gallon (PPG) grams per liter (GPL) for coatings specified herein are believed to be in compliance with limits set forth by the air pollution control agency having authority in the area the work is to be performed. The VOC rating for each coating material to be used is included in the appropriate section of these specifications. The Contractor shall verify that each coating used is in compliance with the aforementioned air pollution limits. Thinning of coatings in excess of the coating manufacturer's recommendations is not permitted.
- B. Contact with Potable Water - Interior tanks coatings specified herein are in compliance with the ANSI/NSF Standard 61 and ANSI/NSF Standard 600 for Potable Water Contact.

- C. Safety Requirements - The Contractor shall comply with all health and safety regulations and requirements of OSHA, including but not limited to, 29 CFR Parts 1910 Confined Spaces for General Industry; Final Rule (or State Health and Safety Regulatory Agency), SSPC-PA Guide 3, and the paint and abrasive manufacturers. Should vents, holes, rigging attachments, or any other modification, cutting, or welding be required to meet safety standards, they may be accomplished at the expense of the Contractor upon submitting of details in writing to, and with subsequent approval by the Owner.
- D. Emissions - Compliance with local, state, federal regulations concerning emissions of solid, particulate, or gaseous matter as a result of the cleaning, painting, or other operations under this Agreement shall be the responsibility of the Contractor.
- E. Waste Classification - Contractor shall immediately after Notice to Proceed satisfy all Laws and Regulations pertaining to the classification of waste generated on the project. Waste shall be understood to include abrasive blasting residuals, paint containers, unused paint and thinners, solvents or any other material whose disposal is subject to requirements contained in Laws and Regulations.
- F. Responsibility - The compliance with all regulations shall be accomplished without supervision from the Owner, Engineer, or other direct or indirect agents of the Owner.
- G. No on-site work is to be done between sunset and sunrise. The times for work shall also comply with local, state and federal regulations and laws regarding days of week, noise and interference with activities of surrounding persons. Should tanks interior temperatures be excessive for personnel welfare during daylight hours, permission may be granted by the Owner to conduct work at night provided that the necessary steel temperature, air temperature, humidity and dew point requirements are met. This permission shall only be granted if the Contractor provides the proper lighting and safety equipment.
- H. All rigging attachments present on the tanks shall be carefully inspected by the Contractor prior to use. The Contractor assumes all responsibility for use of any existing or added attachments.
- I. The job site shall be kept in a clean and safe condition at all times. The daily debris shall be collected in covered containers and disposed of in a manner that will place no liability for hazardous waste on the Owner. Absolutely no paint, solvent material, gasoline, oil or other toxic or hazardous material is to be disposed of at or in the vicinity of the tanks site.
- J. The tanks shall be drained during cleaning and painting and curing of the paint.

#### 1.17 PROTECTION OF PROPERTY

- A. All inlet, outlet, and drainpipe openings in the tanks shall be covered by the Contractor with a cover or pneumatic plug to keep blasting abrasive and paint material from entering the openings. Any Owner's equipment in or around the vicinity of the tanks shall be covered to protect it from damage.
- B. Special precautions shall be taken by the Contractor to restrict and control windborne fallout of residue and particulate matter from cleaning and preparation operations,

and/or paint due to the close proximity of adjacent property or vehicles. The Contractor shall schedule and coordinate his work to avoid windborne fallout.

- C. All damage to existing facilities and adjacent property resulting from the Contractor's operations shall be cleaned, repaired or replaced by the Contractor at no additional expense to the Owner, within 30 days of substantial completion, and final acceptance of the work will not be granted nor will final payment be issued until the damage has been repaired to the satisfaction of the Owner.
- D. The tanks must be drained for all tanks painting, including exterior painting.
- E. No painting on the interior and/or exterior of the tanks shall be done when the relative humidity is greater than 85%, or the temperature of the steel is or is expected to be less than 5°F above the dew point temperature during the application and the initial curing the coatings. The above requirements in no way relieve the Contractor from conforming to the requirements of the paint manufacturer if those requirements are more stringent.

#### 1.18 FIRST ANNIVERSARY INSPECTION

- A. The First Anniversary Inspection as described in AWWA D102 shall apply.
- B. The Owner, with the aid of the Contractor, shall conduct the First Anniversary Inspection. The Contractor shall furnish an experienced foreman, scaffolding, rigging and assistance for the inspection and shall be prepared to perform minor touch-up operations. The Contractor shall have at least one gallon of each of the primers, intermediate coatings, and finish coatings at the time of the inspection along with power cleaning tools and abrasive disks for spot cleaning. Touch-up operations shall be completed without additional cost to the owner and shall be considered included as part of the work to furnish and install a proper coating system in accordance with the Contract.
- C. Spot repairs shall be made by the Contractor before returning the tanks back into service. Repairs requiring extensive work and rigging may be delayed until a time mutually agreeable to the Owner and Contractor.
- D. The Contractor shall be responsible for cleaning and disinfection following the First Anniversary Inspection and completion of any touchups and/or repairs. Cleaning and disinfection shall be completed in accordance with ANSI/AWWA C652 and Specifications Section 15050. Cleaning and disinfection following the First Anniversary Inspection shall be completed without additional cost to the owner and shall be considered included as part of the work to furnish and install a proper coating system in accordance with the Contract.

## **PART 2 - PRODUCTS**

### 2.01 MATERIALS

- A. All coatings shall be supplied by the Contractor. The coatings that will be in contact with potable water shall be NSF/ANSI 61 approved products. All coating materials, thinners and solvents shall be furnished by the same paint manufacturer subject to approval by the Engineer.

- B. Abrasives used for blast cleaning shall meet the requirements of the Steel Structures Painting Council Abrasive Specification No. 1 (SSPC-AB1) Type I or Type II, Class A, Grade - select abrasives of the size necessary to produce an the anchor profile in the range recommended by the coating manufacturer.

#### 2.02 TINTING

- A. Deliver paints such that each coat is of a contrasting color with the exterior finish coat in the color selected by the Owner.
- B. No job tinting is permitted.

#### 2.03 COATING MATERIALS

- A. Coating products manufactured by the Carboline Company, International Paint, PPG/Ameron, Sherwin Williams, Tnemec Company, Inc., or approved equal may be submitted for approval. Proposed substitute manufacturer materials must be proven to meet or exceed the properties of the above manufacturers.
- B. All interior coating materials must be certified in accordance with NSF/ANSI Std. 61 for use on potable water tanks.
- C. Request for substitutions will be considered provided the following minimum conditions are met:
  - 1. The proposed coating system shall use an equal or greater number of separate coats to achieve the required dry film thickness.
  - 2. The proposed coating system shall use coatings of the same generic type.
  - 3. The proposed coating system shall meet or exceed the performance criteria of the specified coating system.
  - 4. Request for substitutions shall have the directions for application and description literature, which includes generic type, nonvolatile content by volume, and information confirming that the substitution is equal to the specified coating system.
- D. No extra contract time will be granted for evaluation of substitute materials.

### **PART 3 - EXECUTION**

#### 3.01 GENERAL

- A. All work shall be accomplished by skilled workmen in a professional manner.
- B. All grinding, abrasive blasting, coating, or lining application shall be done by experienced personnel.
- C. All work shall comply with Local, County, State, and Federal regulations concerning open-air blasting and pollution control.
- D. All rigging shall meet OSHA requirements and shall be operated and maintained in a safe manner, and will conform to industry standards. All rods and other tanks appurtenances that are used for rigging purposes shall be carefully checked for

structural integrity before use in climbing or rigging. Deficiencies shall be reported and corrected before use.

- E. The Contractor shall test all coatings to be removed to determine environmental requirements for removal and proper disposal.
- F. Contain painting operations to prevent overspray and paint spatter.
- G. Surfaces to be prepared and coated shall be cleaned and coated in accordance with Table 3.01-1 and Table 3.01-2

### 3.02 SAFETY

- A. NOTE: The Contractor is responsible for the integrity of any rigging connections. All rods and rigging points shall be carefully checked for structural integrity before use in climbing or rigging of the tanks. Items found to need repair shall be disassembled, cleaned and repaired. All modifications shall be reviewed by the Engineer before execution.

### 3.03 PROTECTION OF AREAS NOT TO BE COATED

- A. All areas that are not specified to be coated or repaired shall be adequately protected to avoid any damage during all repairs, washing, blasting, and painting operations. The Contractor shall confer with the Owner before conducting any work, to clarify these areas.
- B. Any damage shall be repaired at the Contractor's expense immediately upon discovery.

### 3.04 EQUIPMENT

- A. All equipment, (compressor, blast pots and paint pumps, etc.) shall be in good operating condition and of sufficient capacity to provide satisfactory results for cleaning and painting.
- B. Compressed air for blasting and painting shall be free from detrimental amounts of water or oil. Adequate traps and/or dryers shall be provided, per ASTM D 4285.
- C. Adequate lighting, per SSPC Guide 12, shall be provided inside the tanks to properly allow for safety, workmanship and inspection.
- D. Air hoods, respirators and proper and sufficient ventilation shall be provided during blasting, painting and curing.
- E. Contractor must have sufficient explosion proof ventilation equipment to properly and efficiently expel dust and paint fumes out of unit to prevent injury to workmen or the accumulation of volatile gases.
- F. Contractor shall have available at the site, all inspection and measuring equipment such as wet and dry film thickness gages, wet bulb-dry bulb measuring equipment, steel temperature measuring equipment, holiday detector equipment, etc., as required by these Specifications.

### 3.05 SURFACE PREPARATION METALS

- A. Sharp edges, weld protrusions and other protrusions shall be rounded by grinding. Weld spatter shall be completely removed.
- B. The surfaces to be painted shall be free from mud, oil, grease, dust, moisture, old paint, or other foreign material that would cause adhesion problems.
- C. Pressure washing with clean potable water shall be performed in accordance with SSPC-SP WJ-4 at a minimum 3,000 PSI at the tip. Washing will be performed to remove all dirt, chalked paint, loose paint, mildew, or other foreign material. Pressure washing may be supplemented with brushes, brooms, cleaning agents, etc. to produce a properly cleaned surface. A final rinse of clean potable water shall be used to remove all residue detergents.
- D. All surfaces shall be cleaned in accordance with Table 3.05-1
- E. Surfaces cleaned to bare metal shall be coated during the same work shift that the cleaning was accomplished unless prior arrangements are made with the Owner or Owner's representative. The blasted surfaces will be re-blasted if oxidation occurs prior to application of the prime coat.

### 3.06 COATING APPLICATION FOR METALS

- A. All coatings shall be from the same manufacturer from among those listed in Table 3.06-1
- B. Stripe coat all edges, corners, welds, bolts and seams on the designated surfaces.
- C. Coatings applied to interior metal surfaces shall be ANSI/NSF 61/NSF 600 approved products.
- D. Coatings applied to exterior metals surface shall include a primer, intermediate at finish coat where the metal substrate or corrosion was exposed.

### 3.07 SURFACE PREPARATION CONCRETE

- A. Prepare exterior concrete surfaces to be painted using pressurized, clean potable water at 3,200 to 5,000 psi in accordance with ASTM D4259 Section 7 "Water Blast Cleaning".
- B. Prepare the interior concrete walls, floor, and ceiling for coating in accordance with ASTM D4259 Section 8 "Abrasive Blast Cleaning" to achieve a sound concrete surface having a surface texture recommended by the coating manufacture.
- C. Fill bug holes, voids cracks of the interior concrete with an epoxy filler as recommended by the coating manufacture.
- D. Remove all residues, loose materials and debris prior to coating application. Air blow down, water wash down or vacuuming may be used.

### 3.08 COATING APPLICATION FOR CONCRETE

- A. Prior to coating application test for moisture in concrete in accordance with ASTM D4258 or ASTM F1869 as recommended by the coating manufacture. In no case, shall

coating be applied to concrete surfaces that exceed moisture limits established by the coating manufacturer and Engineer.

- B. Apply coating materials for the exterior and interior concrete surfaces from coating systems identified in Table 3.07-1.



**Table 3.05-1 Surface Preparation of Metals**

PROCESS	INTERIOR		EXTERIOR	
	Ductile Iron	Carbon Steel	Ductile Iron	Carbon Steel
<b>Pressure Washing</b>	SSPC/NACE WJ-4	SSPC/NACE WJ-4	SSPC/NACE WJ-4	SSPC/NACE WJ-4
<b>Solvent Cleaning</b>	NAPF 500-03-01	SSPC-SP 1	NAPF 500-03-01	SSPC-SP 1
<b>Abrasive Blast Cleaning</b>	NAPF 500-03-05	SSPC-SP 10/NACE No. 2	NAPF 500-03-05	SSPC-SP 6/ NACE No. 3
<b>Power Tool Cleaning</b>	N/A	SSPC-SP 15	NAPF 500-03-03A	SSPC-SP 15 SSPC-SP 3 <sup>A</sup>

**Aluminum and other non-ferrous substrates** (e.g. galvanizing) shall be pressure washed in the same manner as ductile iron and steel and further prepared per SSPC SP-16 with the intent of removing all existing coating. Avoid blasting damage and distortion of the substrate. Power tools may be used to supplement cleaning. A surface treatment or conversion coating recommended by the coating manufacturer shall be the first coat applied immediately following surface preparation and solvent cleaning.

A-Applies to spot repairs where authorized by the Engineer.

**Table 3.06-1 Metal Coating Systems**

Interior Coating Metal	First Coat	Second Coat	Finish Coat A
<b>Sherwin Williams</b>	Sherplate 600		Sherplate 600
<b>Tnemec Company</b>	Series 135		Series 1075
<b>Carboline</b>	Hydroplate 1080		Hydroplate 1080
Exterior Coating Metal	First Coat	Finish B Option 1 Waterborne Acrylic	Finish B Option 2 Polyurethane
<b>Sherwin Williams</b>	Macropoxy 646 FC	Sher-Cryl™ HPA High Performance Acrylic	Hi-Solids Polyurethane
<b>Tnemec Company</b>	Chembuild ®Series 135	Enduratone ® Series 1029	Endura-Shield ® II Series 1075
<b>Carboline</b>	Carboguard 890	3359 DTMC (alkyd option)	134 HG (urethane)
Aluminum and Other Non-Ferrous Substrates (e.g. Galvanizing)	First Coat	Second Coat	Finish Coat
<b>Interior</b>	Surface Treatment	Epoxy	Epoxy
<b>Exterior</b>	Surface Treatment	Epoxy	Acrylic or Polyurethane

- A. A third interior coat may be applied as recommended by the manufacturer. It is intended that the finished system film thickness should range from 12 to 18 mils without exceeding the recommended maximum thickness per coat. Three coat application may reduce the occurrence of holidays, particularly in ductile iron pipe.
- B. The finish coat color should be selected to match the existing.
- C. Apply the epoxy and finish coat products used for ductile iron and steel

**Table 3.07-1 Coating Systems for Interior Concrete <sup>A</sup>**

<b>Interior Coating Concrete</b>	<b>Primer Coat</b>	<b>Finish Coat A</b>
<b>Tnemec Company</b>	Pota-Pox Plus Series N140 <sup>C</sup>	Elasto-Shield Series 264
<b>Sherwin Williams</b>	Sherflex S	Sherflex Elastomeric Polyurethane
<b>Carboline</b>	Carbocrete 4010 repair mortar	Hydroplate 1100 (two coats)
<b>Exterior Coating Concrete</b>	<b>Prime Coat</b>	<b>Finish Coat A</b>
<b>Tnemec Company</b>	Series 156 (as needed for repairs)	Series 1026
<b>Sherwin Williams</b>	Loxon Conditioner (as needed for repairs)	Loxon XP
<b>Carboline</b>	Sanitile 120 primer (as needed for repairs)	Flexxide Elastomer

- A. For Manufacturer surface preparation references to CSP (concrete surface profile) See ICRI Guideline No 037032.
- B. B- The finish coat color should be selected to match the existing.
- C. Tnemec Coating System primer shall be minimum 2-4 mils for compliance with NSF 600.

**END OF SECTION**

**FINAL REPORT  
GEOPHYSICAL INVESTIGATION  
CITY OF TAMPA REPUMP STATION SITE  
WEST GROUND STORAGE TANK (GST)  
TAMPA, FL**

Prepared for Husky Corp.  
St. Petersburg, FL

Prepared by GeoView, Inc.  
St. Petersburg, FL



November 14, 2019

Mr. Scott Crandall, P.E.  
Husky Corp.  
204 37<sup>th</sup> Avenue North, # 435  
St. Petersburg, FL 33704

**Subject: Transmittal of Final Report for Geophysical Investigation  
City of Tampa Repump Station Site – Tampa, FL  
West Ground Storage Tank (GST)  
GeoView Project Number 30577**

Dear Mr. Crandall,

GeoView, Inc. (GeoView) is pleased to submit the final report that summarizes and presents the results of the geophysical investigation conducted at the above referenced site. Ground penetrating radar equipment was used to evaluate near-surface geological conditions. GeoView appreciates the opportunity to have assisted you on this project. If you have any questions or comments about the report, please contact us.

**GEOVIEW, INC.**

Michael J. Wightman, P.G.  
Principal Geophysicist, President  
Florida Professional Geologist  
Number 1423

Scott F. Purcell  
Senior Geophysicist

*A Geophysical Services Company*

**4610 Central Avenue  
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**Tel.: (727) 209-2334  
Fax: (727) 328-2477**

## **1.0 Introduction**

A geophysical investigation was performed on November 7, 2019 using ground penetrating radar (GPR) within portions of the interior and wall of a 5-million-gallon water tank (tank) within the Tampa Repump Station located at 17101 Dona Michelle Drive in Tampa, Florida. The tank was drained of water prior to the geophysical investigation. Access to the tank interior was provided through a manhole along the south side.

The tank has experienced water leaks in the past. Previous repair activities were performed along the interior areas of the concrete floor bottom, consisting of crack repair, patching and sealant as shown on Figures 1 and 2 and on site pictures 1-3 (Appendix 1).

The tank is approximately 166 feet (ft) in diameter. The geophysical survey area was approximately 80 ft long and 20 ft wide along the approximate southeast side of the tank floor where cracks and previously repaired areas are present. An additional GPR investigation was performed along the exterior wall in an area with cracks in the concrete, as shown in the Site Picture 4 and Exterior Diagram (Appendix 1).

The purpose of the geophysical investigation was to determine the presence and locations of potential voids below the interior concrete bottom of the tank and check the integrity of the exterior tank wall in a designated area where cracking has occurred. The location of the interior geophysical survey area is provided on Figures 1 and 2. The approximate location of the exterior geophysical survey area is provided as part of Picture 4 in Appendix 1. A discussion of the field methods used to generate the report figure is provided in Appendix A2.1.

## **2.0 Description of Geophysical Investigation**

### **2.1 Interior of Tank**

A GPR survey was conducted along a series of perpendicular transects spaced 5 ft apart on the designated interior concrete bottom area of the tank. Additional GPR data was collected across identified anomalies along the interior floor slab. The interior GPR data was collected with a GSSI radar system with a 900 Megahertz (MHz) antenna with a time range setting of 30 nanoseconds. This equipment configuration provided an estimated depth of exploration of 3 to 4 ft below the surface of the tank.

## 2.2 Exterior Walls of Tank

The GPR survey was conducted in an area where cracking is present in the exterior wall of the tank. The survey was performed along a series of horizontal transects spaced two ft apart between two previously patched areas. The exterior GPR data was collected with a GSSI Mini radar system with a 2600 MHz antenna. This system provided an exploration depth of 6 to 9 inches.

A description of the GPR technique and the methods employed for void characterization studies is provided in Appendix A2.2.

## **3.0 Identification of Possible Void Features Using GPR**

The features observed on GPR data that are most commonly associated with void conditions are:

- The occurrence of relatively continuous and horizontal GPR reflectors, representing soil horizons, which in the area of the anomaly dip down toward the feature center.
- The actual void or soil pipe is typically represented by parabolic or bow-tie shaped high amplitude GPR reflectors.
- Erosional features are characterized by a downwarping towards a common center and possible discontinuity in the GPR reflector sets associated with various soil horizons. An increase in GPR signal penetration depth or amplitude is often observed.

The greater the severity of the void conditions, or an observed combination of these reflection patterns, the greater the likelihood that the identified anomaly is a void or a low-density soil zone.

## **4.0 Survey Results**

### 4.1 Interior of Tank

Thickness of the concrete tank bottom is estimated to be approximately 4 inches. The bottom of the tank is a structural slab with 2 layers of #4 rebar spaced 8 inches on center.

No voids were observed beneath the slab. Three areas of density variation were observed in the GPR data. These three areas possibly indicate the presence of minor, lower density soils when compared to adjacent soils. The subtle variation could also be indicative of changes in soil types, moisture content or a minor soil disturbance. The locations of these three areas are provided on Figures 1 and 2.

A discussion of the limitations of the GPR technique in void characterization studies is provided in Appendix A2.3. An example of the GPR data associated with an area of suspected disturbed soils is provided in Appendix 1.

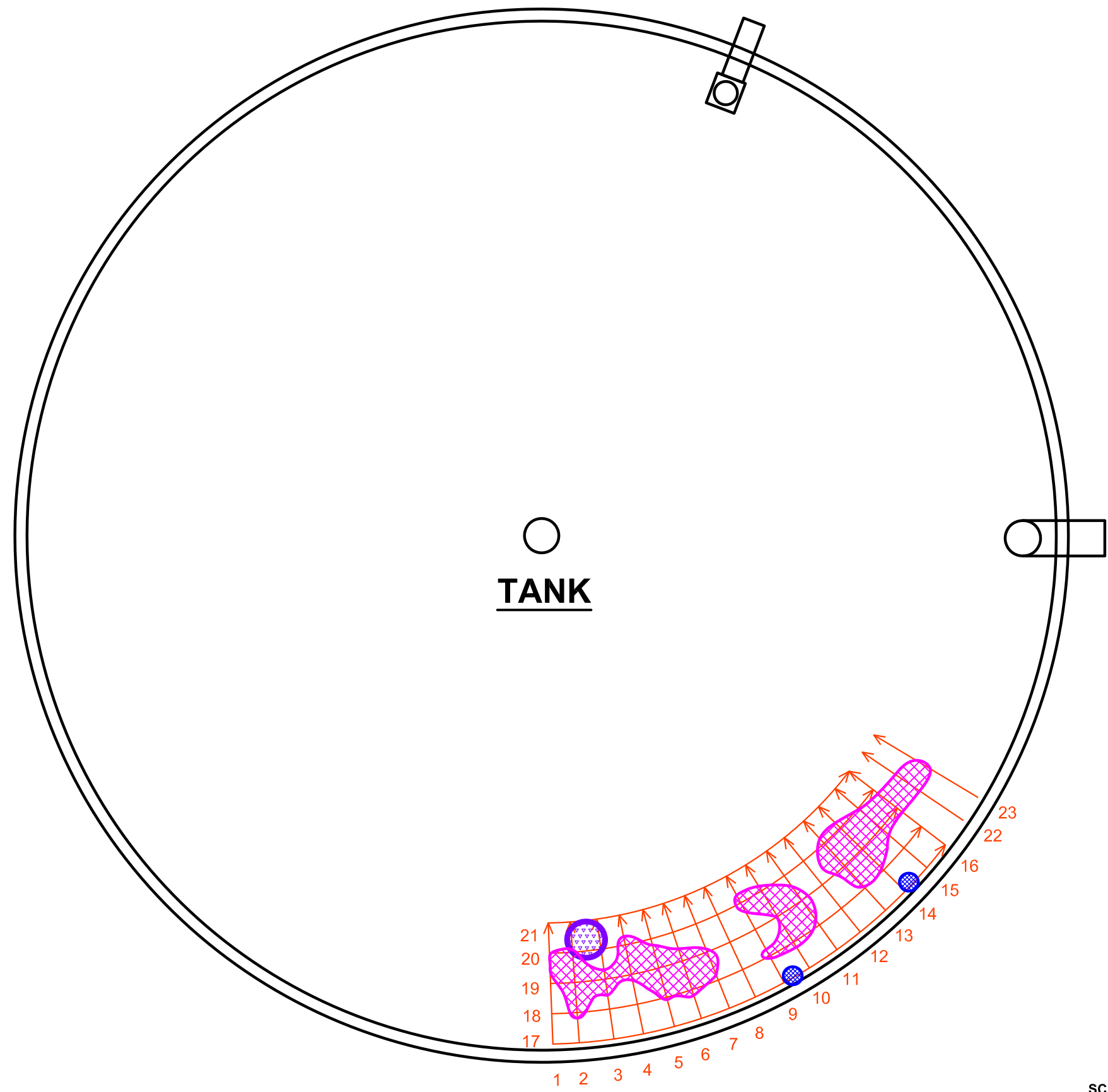
#### 4.2 Exterior Wall of Tank

Three areas on the exterior tank wall were scanned with a hand-held GPR. The areas scanned are shown on the Exterior Tank Diagram located in the appendix of the report. The GPR survey did not indicate the presence of an internal voids within the surveyed area of the tank wall. The reflection patterns were consistent with competent concrete with vertical rebar reinforcing on 12 to 14-inch centers. An example of the rebar that was observed in the GPR data is provide as GPR Example 2 in Appendix 1.




## **APPENDIX 1**

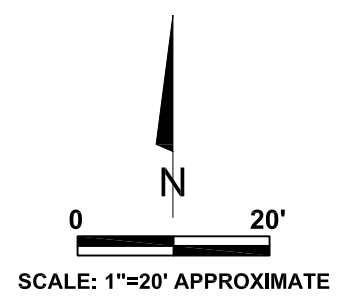
### **FIGURES, SITE PICTURES AND EXAMPLES OF GPR DATA**





**EXPLANATION**

- 10 → GPR TRANSECTS & DESIGNATION
-  LOCATION OF OLD PATCHES
-  LOCATION OF SPALL PATCHES
-  AREA OF SOIL DENSITY VARIATIONS



CITY OF TAMPA REPUMP STATION SITE - MG WGST  
 17101 DONA MICHELLE DRIVE  
 TAMPA, FLORIDA

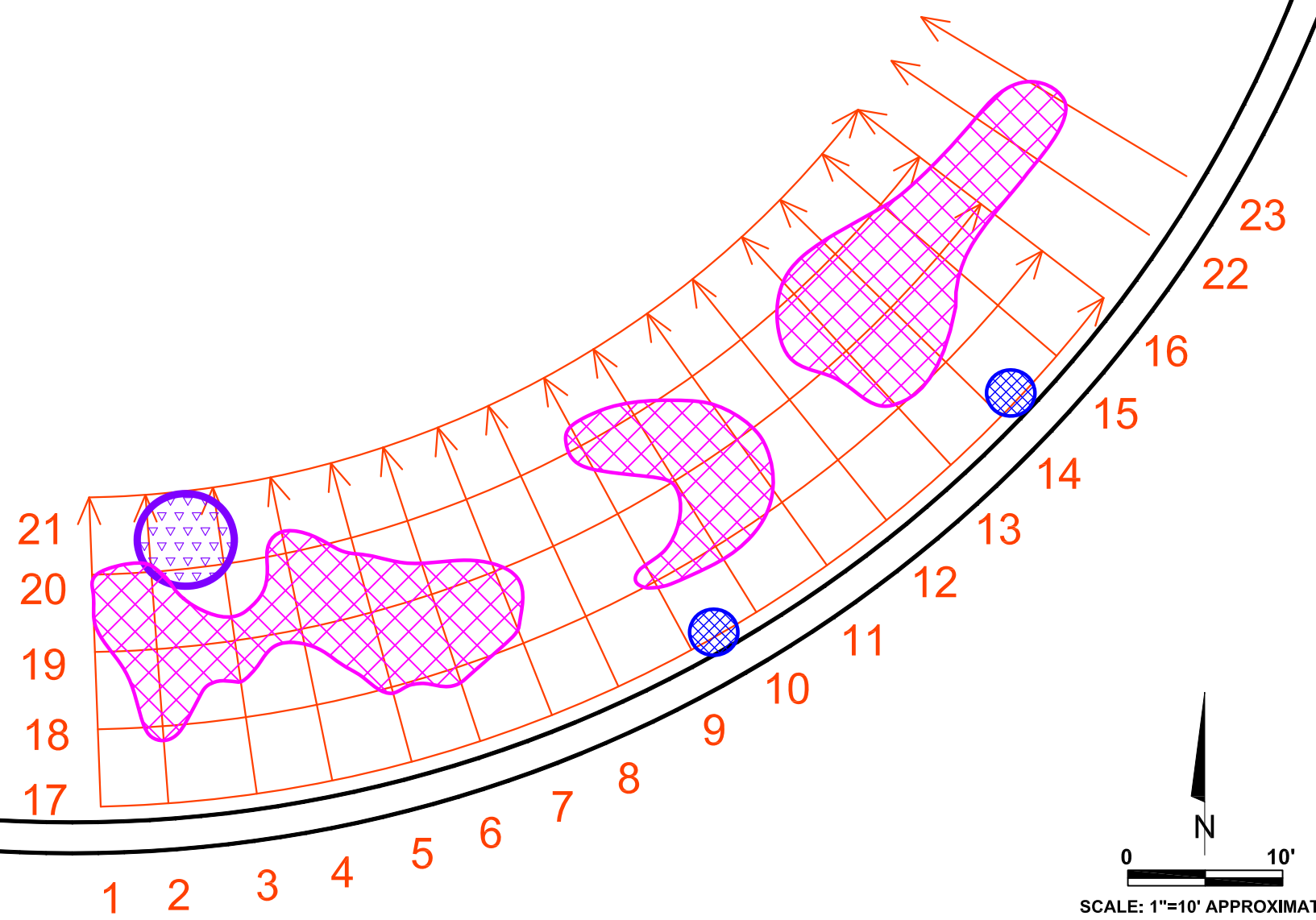
HUSKY CORP.  
 ST. PETERSBURG, FLORIDA

PROJECT:  
 30577  
 DATE:  
 11/14/19

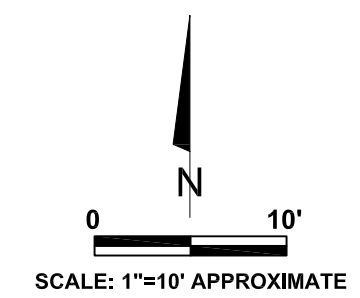


**FIGURE 1**  
 OVERALL SITE MAP  
 SHOWING RESULTS  
 OF GEOPHYSICAL  
 INVESTIGATION

○  
**TANK**



- EXPLANATION**
- 10 → GPR TRANSECTS & DESIGNATION
  - LOCATION OF OLD PATCHES
  - LOCATION OF SPALL PATCHES
  - AREA OF SOIL DENSITY VARIATIONS



CITY OF TAMPA REPUMP STATION SITE - MG WGST 17101 DONA MICHELLE DRIVE TAMPA, FLORIDA		PROJECT: 30577 DATE: 11/14/19
HUSKY CORP. ST. PETERSBURG, FLORIDA		
	FIGURE 2 SITE MAP SHOWING RESULTS OF GEOPHYSICAL INVESTIGATION	



Site Picture 1 Showing A Patch on the Tank Floor Slab



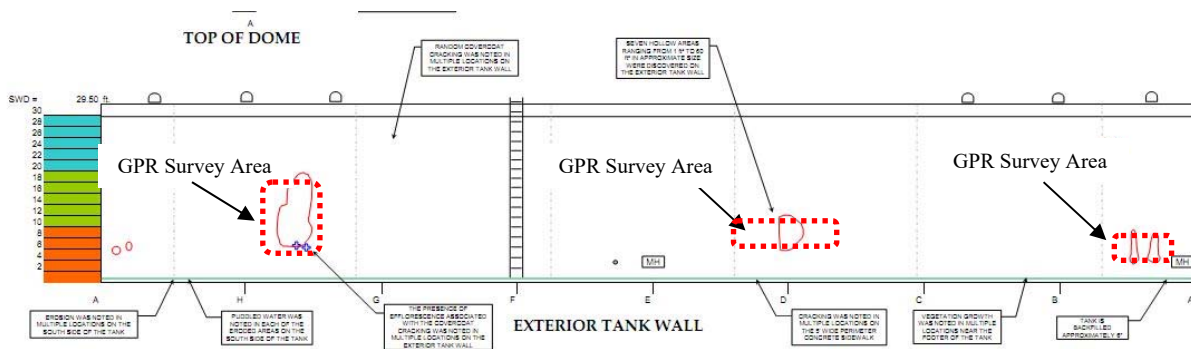
Site Picture 2 Showing Patches on the Tank Floor Slab



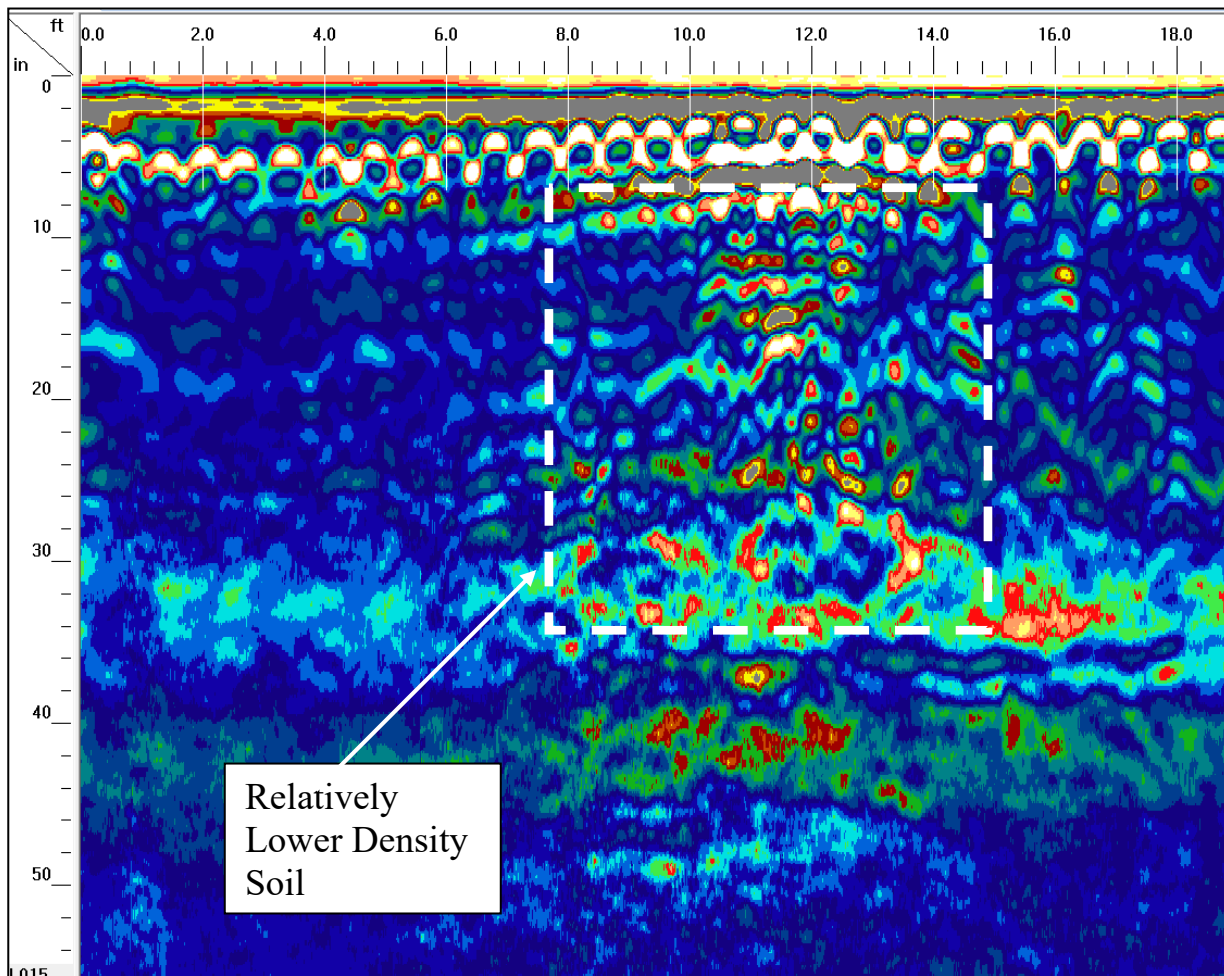
Site Picture 3 Showing Concrete Spalling Repairs on the Tank Floor Slab



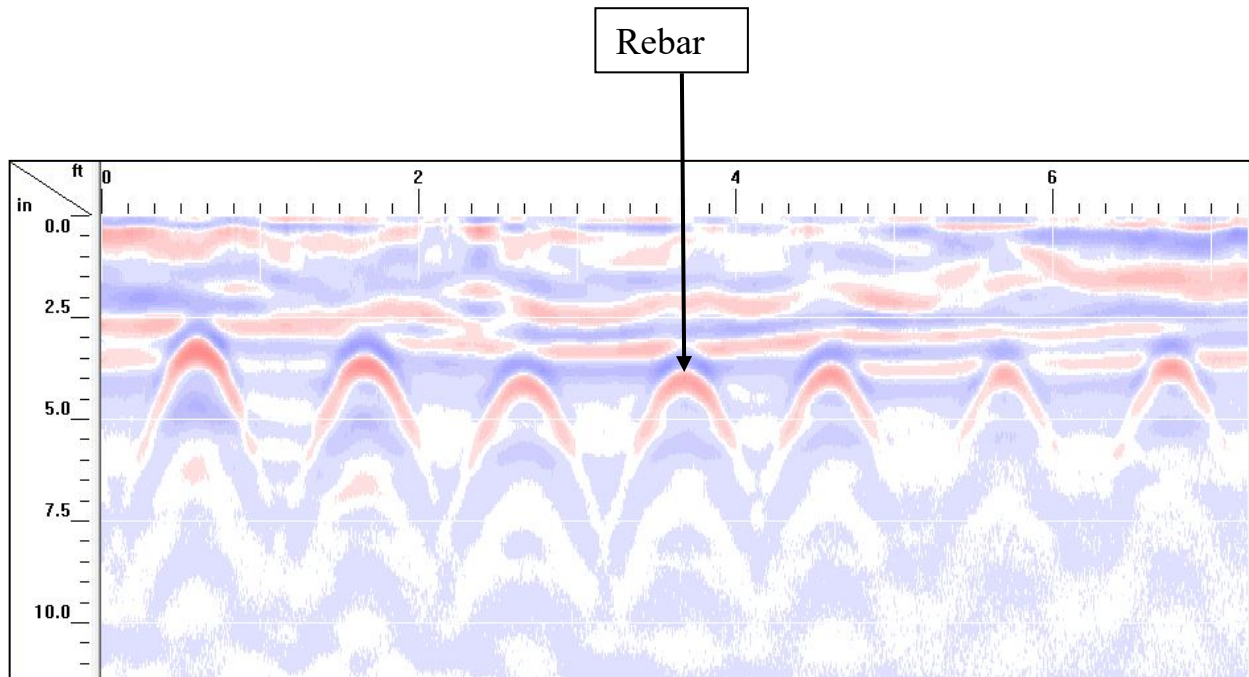
Site Picture 4 Showing the Survey Area of the Exterior Tank Wall and the Approximate Locations of the GPR Transects



Exterior Diagram Showing the Location of the GPR Survey Area



Example View of GPR Anomaly Area Seen Below MB WGS Tank Slab Indicating Variations in Soil Density (GPR Transect 15)



GPR Example 3 Showing Good Concrete and the Presence of Rebar in the Tank Wall

## **APPENDIX 2**

### **DESCRIPTION OF GEOPHYSICAL METHODS, SURVEY METHODOLOGIES AND LIMITATIONS**

#### A2.1 On Site Measurements

The measurements that were collected and used to create the site map were made using the plan-view drawing of the water tank provided by Husky Corp., and a fiberglass measuring tape to establish the geophysical survey grid lines. The degree of accuracy of such an approach is typically +/- 2.5% for lengths and +/- 2.5 degrees for angles.

#### A2.2 Ground Penetrating Radar

Ground Penetrating Radar (GPR) consists of a set of integrated electronic components that transmits high frequency (2600 and 900 megahertz [MHz]) electromagnetic waves into the ground and records the energy reflected back to the ground surface. The GPR system consists of an antenna, which serves as both a transmitter and receiver, and a profiling recorder that both processes the incoming signal and provides a graphic display of the data. The GPR data can be reviewed as both printed hard copy output or recorded on the profiling recorder's hard drive for later review. GeoView uses a GSSI GPR system.

A GPR survey provides a graphic cross-sectional view of subsurface conditions. This cross-sectional view is created from the reflections of repetitive short-duration electromagnetic (EM) waves that are generated as the antenna is pulled across the ground surface. The reflections occur at the subsurface contacts between materials with differing electrical properties. The electrical property contrast that causes the reflections is the dielectric permittivity that is directly related to conductivity of a material. The GPR method is commonly used to identify such targets as underground utilities, underground storage tanks or drums, buried debris, voids or geological features.

The greater the electrical contrast between the surrounding earth materials and target of interest, the greater the amplitude of the reflected return signal. Unless the buried object is metal, only part of the signal energy will be reflected back to the antenna with the remaining portion of the signal continuing to propagate downward to be reflected by deeper features. If there is little or no electrical contrast between the target interest and surrounding earth materials it will be very difficult if not impossible to identify the object using GPR.

The depth of penetration of the GPR signal is very site specific and is controlled by two primary factors: subsurface soil conditions and selected antenna

frequency. The GPR signal is attenuated (absorbed) as it passes through earth materials. As the energy of the GPR signal is diminished due to attenuation, the energy of the reflected waves is reduced, eventually to the level that the reflections can no longer be detected. As the conductivity of the earth materials increases, the attenuation of the GPR signal increases thereby reducing the signal penetration depth. In Florida, the typical soil conditions that severely limit GPR signal penetration are near-surface clays and/or organic materials.

The depth of penetration of the GPR signal is also reduced as the antenna frequency is increased. However, as antenna frequency is increased the resolution of the GPR data is improved. Therefore, when designing a GPR survey a tradeoff is made between the required depth of penetration and desired resolution of the data. As a rule, the highest frequency antenna that will still provide the desired maximum depth of penetration should be used. For GPR void investigations, a high-frequency (900 MHz) antenna is used.

A GPR survey is conducted along survey lines (transects) that are measured paths along which the GPR antenna is moved. An integrated survey wheel electronically records the distance of the GPR system along the transect lines.

For void characterization surveys, the GPR survey is conducted along a set of perpendicularly orientated transects. The survey is conducted in two directions because subsurface features such as voids are often asymmetric. Spacing between the transects typically ranges from 2 to 5 ft. Closely spaced grids are used when the objective of the GPR survey is to identify all void features within a project site. This information can be used to provide recommended locations for geotechnical borings.

Depth estimates to the top of lithological contacts or void features are determined by dividing the time of travel of the GPR signal from the ground surface to the top of the feature by the velocity of the GPR signal. The velocity of the GPR signal is usually obtained from published tables of velocities for the type and condition (saturated vs. unsaturated) of soils underlying the site. The accuracy of GPR-derived depths typically ranges from 20 to 40 percent of the total depth.

### A2.3 Interpretation and Limitations of Geophysical Data

The analysis and collection of GPR data is both a technical and interpretative skill. The technical aspects of the work are learned from both training and experience. Having the opportunity to compare geophysical data collected in numerous settings to the results from geotechnical studies performed at the same locations develops interpretative skills for void characterization studies.



The ability of GPR to collect interpretable information at a project site is limited by the attenuation (absorption) of the GPR signal by underlying soils. Once the GPR signal has been attenuated at a particular depth, information regarding deeper geological conditions will not be obtained. In addition, GPR data can only resolve subsurface features that have a sufficient electrical contrast between the feature in question and surrounding earth materials. If an insufficient contrast is present, the subsurface feature will not be identified.

GeoView can make no warranties or representations of geological conditions that may be present beyond the depth of investigation or resolving capability of the GPR or SIR equipment or in areas that were not accessible to the geophysical investigation.