City of Milwaukee

Milwaukee Water Works

Safe, Abundant Drinking Water.

City of Milwaukee
Department of Public Works
Milwaukee Water Works

Specifications for Official Notice No. 24-1-2015

West Ground Storage Tank

LS-34: Tank Coating & Appurtenance Modifications

2015

Mark J. Scheller, P. E.
Chief Design Engineer

Carrie M. Lewis
Superintendent

Mark A. Gremmer, P.E.
Mechanical Engineer III

GENERAL REQUIREMENTS

PART 1 DEPARTMENT OF PUBLIC WORKS – GENERAL SPECIFICATIONS

The Department of Public Works General Specifications applies to all contracts. http://www.mpw.milwaukee.gov/services/bids_home

PART 2 SPECIFIC OFFICIAL NOTICE & GENERAL OFFICIAL NOTICE

The Specific Official Notice as it appears in The Daily Reporter and General Official Notice are a part of these Contract Documents.

PART 3 SPECIFICATIONS

LS-34; Tank Coating and Appurtenance Modifications to West Ground Storage Tank

Table of Contents

JOB REQUIREMENTS

LS-34 COATING & APPURTENANCE MODIFICATIONS

JR-1 FORM OF BID Contractor shall submit a Total Bid for furnishing the complete job in accordance with the Contract Documents.

JR-2 JOB LOCATION The west ground water storage tank is located at 3641 West Lincoln Avenue, Milwaukee, WI 53215.

JR-3 GENERAL DESCRIPTION OF WORK The work to be performed under the provisions of this contract and as set forth in these documents consists of the supply and installation of all materials, labor, supervision, inspection, and rentals for all work involved and described below.

JR-4 CONTRACT DRAWINGS The contract drawings upon which the proposal is to be based are listed hereunder:

LS - 34 - 01	Location Map & Drawing Index
LS - 34 - 02	Site Plan, Tank Plan & Tank Elevation
LS - 34 - 03	Appurtenance Modification Details

Above drawings are general in nature and are intended to indicate the relative locations of the equipment specified in the space provided. It shall be the responsibility of the successful bidder to ascertain the suitability of the specific equipment to be furnished in regard to the space allotted.

JR-5 REFERENCE DRAWINGS The following reference drawings are the original construction drawings. These are included here for general information only. The drawings are assumed to be accurate; however, the CONTRACTOR is responsible for field verification of any and all dimensions essential to the work:

Elevations & Sections
Plans and Details
Miscellaneous Details
Cupola Details

JR-6 PRE-BID MEETING A **MANDATORY** pre-bid meeting for all prospective bidders will be held on Thursday, February 19, 2015 at 10:00 A.M. in the Howard Purification Plant Conference Room, 3929 South 6th Street, Milwaukee, WI 53221. The City of Milwaukee will **ONLY** receive bids from prospective bidders who are in attendance at the **MANDATORY** Pre-Bid Meeting. The official envelope for submitting a bid will be available at the **MANDATORY** Pre-Bid Meeting. Bidder participation is urged to become familiar with all aspects of the project and bidding requirements.

JR-7 SITE VISIT A site visit will be available at the conclusion of the **MANDATORY** Pre-Bid Meeting.

JR-8 PRE-CONSTRUCTION MEETING After the Notice to Proceed is issued, a date shall be set for the pre-construction meeting to be held at the job site. Construction details of the project will be discussed in the meeting.

JR-9 JOB SCHEDULE Within ten (10) business days after Notice to Proceed is issued, the contractor shall submit a construction schedule for approval. The schedule shall be made in sufficient detail to indicate dates of each significant operation. The schedule shall be such that the entire job will be completed within the specified completion time. Contractor shall submit the construction schedule in hard copy and electronic format using Microsoft Project 2010. However, if an electronic copy cannot be provided in this format, a copy shall be transmitted electronically in a .PDF format and a hard copy of any updated schedules must be provided at all progress meetings.

The contractor shall place all orders for materials promptly after award of the contract. With submittal of the construction schedule, he shall include a schedule of delivery of all major material and equipment required for the job.

The contractor shall immediately notify the City, in writing, of any problems with meeting this schedule. If the construction schedule cannot be met because of materials or equipment deliveries, the contractor shall be required to submit purchase orders and confirmations of delivery, showing the date the order was placed and the promised date of delivery.

JR-10 WORK DAYS AND TIMES Work may take place between the hours of 7:00 AM to 7:00 PM. Work shall not be allowed on Sunday or City of Milwaukee Holidays. Holidays include May 5th, July 3rd and September 7th.

JR-11 START & COMPLETION DATE The Contractor shall commence work on or after Monday, May 4, 2015. The tank will be drained and taken out of service on Monday, June 1, 2015. Work on this project shall be substantially completed by Friday, October 30, 2015. Substantial completion includes cure and disinfection time. The tank shall only be out-of-service a maximum of 120 days. Final Completion shall be prior to Tuesday, November 24, 2015.

JR-12 CHARGE FOR INSPECTION The Contractor will be charged $350.00 per day per inspector for each and every day inspection is required on this Contract after the date allowed for completion or after such extension of time as may have been granted. This charge is further defined in Section 2.5.11 of the Department of Public Works (DPW) General Specifications.

JR-13 PROGRESS PAYMENTS Within ten (10) days after the Notice to Proceed is issued, the contractor shall submit to the City for approval a schedule showing the breakdown of the contract with quantities and prices as a basis for checking and computing progress

estimates. The values shown in the approved breakdown shall be used for pay purposes only and shall not be used as a basis for additions to or deductions from contract work.

When the contractor proceeds properly and with diligence to perform and complete the work on this contract, the Commissioner of Public Works may, from time to time as the work progresses, grant to the contractor an estimate of the amount already earned. In making such progress estimates, there shall be retained 5% of each progress estimate until final completion and acceptance of the work; except that after 50% of the work has been completed and the Commissioner finds that satisfactory progress is being made and all conditions complied with, he may authorize any of the remaining progress payments to be paid in full to the contractor. Progress Payments are further defined in Section 2.9.14 of the Department of Public Works (DPW) General Specifications.

In accordance with Charter Ordinance 7.26 as amended 6-1-72, payment for materials delivered to the work or storage site may be authorized by the Commissioner of Public Works providing the following terms and conditions are met:

A. The work is progressing properly and such materials as specified are properly stored and suitable for permanent incorporation in the work.

B. Materials designated for pay in the next progress estimate after delivery shall be limited to fabricated or manufactured components which are assembled in final form ready for placement in the work

C. The following forms shall be submitted with requests for payment.

    1. Progress Estimate and Request for Payment for Fabricated Materials or Components Properly Stored.

    2. Certification of the Contractor or his duly authorized representative.

    Field Engineer shall verify that material is as specified and properly stored.

D. The contractor shall be responsible for the safeguarding of any such materials against loss or damage whatsoever, and in the case of any loss or damage, the contractor shall replace such lost or damaged materials at no cost to the City. The Commissioner shall reserve the right to deduct from ensuing progress estimates the value of any lost or damaged materials until such loss or damage is restored by the contractor.

E. The Commissioner may limit processing progress estimates to those cases where the amount earned in any pay period for work and materials is $5,000 or more.

F. Any materials for which payment has been made shall not be removed from the work or storage site without the specific written approval of the Commissioner of Public Works.

JR-14 FORMAL CORRESPONDENCE Formal correspondence shall be addressed to: Ms. Carrie M. Lewis, Superintendent of Milwaukee Water Works, 841 North Broadway, Room 409, Zeidler Municipal Building, Milwaukee, WI 53202. Formal correspondence shall include:

1. Request for Change Order.

2. Request for extension of Completion Date

3. Disputes concerning Payment or Field Issues.

4. Payment Requests.

5. Submittals.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Contract description.
2. Owner Operations.
3. Qualifications
4. Specifications and standards.
5. Shop Drawings.
6. Warranty and guarantee.

1.02 CONTRACT DESCRIPTION

A. This contract includes the furnishing of all equipment, labor, supervision, materials and appurtenances for and in connection with the abrasive blasting, coating and appurtenance modifications of the ground storage tank as shown on the contract drawings and further specified herein.

B. Nothing stated in this Project Summary shall influence or override any of the conditions in the Instruction to Bidders, General Conditions, or Technical Specifications. It is included as a service to Bidders for explanation only.

C. The Work to be performed shall include but not be limited to the following:

1. The structure is a 6,000,000 gallon reservoir with an estimated 169 ft. diameter and a sidewall height of 37 ft.
2. Exterior: Abrasive blast clean to a SSPC-SP6 commercial standard, and apply a four (4) coat epoxy urethane system with a zinc primer. Contractor has the option to use a flexible frame containment system or a robotic self contained blast unit with water dampen blasting of the areas not reachable with the robotic unit.

3. Wet Interior: Remove grease, abrasive blast clean to a SSPC-SP10 near-white metal standard, and apply a three (3) coat zinc epoxy system. Alternate system is a two (2) coat zinc/100% solids epoxy system.

4. Foundation: Excavate 6 inches around the foundation to expose the foundation, caulk the gap between the concrete and baseplate, and apply a two (2) coat epoxy on the concrete.

5. Site Work: Excavate 2 inches below tank's concrete foundation. Finished grade around tank shall slope away from tank. Surface drainage shall drain away from tank and not be allowed to pond around tanks perimeter.

6. Repairs:

    a) Install 30" bolted sidewall manway and hinge.

    b) Replace manway gaskets.

    c) Replace 30" wet interior roof hatch.

    d) Replace exterior sidewall ladder, provide fall prevention system.

    e) Repair roof vent panel in cupola.

    f) Install cathodic clips and coupling.

    g) Install safety railing and step-off platform on the roof.

    h) Install rigging couplings with safety clips.

    i) Install handholds on the roof cupola.

7. Miscellaneous

    a) Contractor to protect all sensitive equipment during all water cleaning, blasting and painting.

    b) It is not known whether isolation valves in tank's inlet and outlet piping are capable of completely sealing off the tank from the distribution system. Even with the valves closed, it is possible that a small flow of water may enter the tanks from the distribution system. The contractor is responsible for stopping this flow of water and/or discharging it from the tank to allow the tank's wet-interior to be painted per the Contract Documents.

    c) Prevailing wages are required.

1.03 OWNER OPERATIONS

A. Cooperate with City to minimize conflict, and to facilitate City operations.

1.04 QUALIFICATIONS

A. Submit Contractor's Project Experience form.

1.05 SPECIFICATIONS AND STANDARDS

A. Materials, general design, design loads, allowable stresses, joint design, shop fabrication and field construction shall conform to the requirements of the following latest standard specifications of any technical society, organization, or association, or to codes of local or state authorities:

1. NEC, National Electric Code.

2. AWWA, American Water Works Association.

3. IEEE, Institute of Electrical and Electronic Engineers.

4. ANSI, American National Standards Institute.

5. SSPC, The Society for Protective Coatings.

6. ASTM, American Society for Testing and Material.

7. The Wisconsin Administrative Code.

8. OSHA, U.S. Department of Labor Occupational Safety and Health Act.

9. EPA, United States Environmental Protection Agency.

B. The contractor shall be familiar with the requirements of the above agencies. Any conflict in the contract drawings, these specifications, the contractor's design or construction methods shall result in this contractor performing in a manner which conforms to the applicable requirements. Agencies and/or associations not specified above are referenced in individual specification sections as required.

1.06 SHOP DRAWINGS

A. Within three weeks after Notice to Proceed is issued, the Contractor shall submit to the City for approval a minimum three (3) copies of all shop, fabrication, assembly, and other drawings required by the specifications; all drawings of equipment and devices offered by the Contractor; all drawings showing essential details of any change in design or construction proposed by the Contractor; and all necessary wiring, piping and appurtenance layouts. Drawings of equipment and devices shall show sufficient detail to adequately depict the construction and operation of each item.

B. Each shop drawing shall bear City of Milwaukee, the name and location of the structure, job number, the name of Contractor, the date of the drawing, the date of each correction or revision and the specification numbers and plan sheet numbers applicable thereto.

C. Three (3) revised copies of each drawing shall be submitted each time a drawing is returned to the Contractor for revision. The final approval of a drawing shall be included in the Operation and Maintenance manuals,

D. After approval by the City, all such drawings shall become a part of the contract documents and the work or equipment shown thereby shall be furnished and installed as shown unless otherwise required by the City. No work shall be performed or equipment manufactured until drawings have been approved. The approval of drawings submitted by the Contractor will be for, and will cover only general conformity to the plans and specifications and will not constitute a blanket approval of all dimensions, quantities, or details of the material or equipment shown by such drawings, nor shall such approval relieve the Contractor of responsibility for errors contained therein

E. At the completion of work and prior to final payment, the Contractor shall provide the City with three (3) sets of "as-built" drawings for the completed job showing all new and modified appurtenances. All conduit or similar items shall be located by dimensions and elevations. The Contractor will be responsible for the accuracy of these drawings.

1.07 WARRANTY AND GUARANTEE

A. The Contractor shall furnish a written one (1) year warranty from the date of official acceptance against defective materials or workmanship before the final payment is made.

B. During the period of one (1) year from and after the date of the final acceptance by the City of the work embraced by this contract, the Contractor shall make all needed repairs arising out of defective workmanship or materials, or both, which in the judgment of the Commissioner of Public Works, shall become necessary during such period. The City will perform an inspection during the spring of the final year of the warranty. The Contractor is not required to attend this inspection. A written report summarizing the inspection and detailing any needed repairs will be provided to the Contractor. The Contractor shall make all repairs within 6 months of receiving the report.

C. Whenever defective equipment or materials are replaced, the warranty period for the replacement equipment or materials shall be the remaining warranty period for the original, replaced equipment or materials.

D. If within ten days after mailing of a notice in writing to the Contractor, or his agent, the said Contractor shall neglect to make, or undertake with due diligence to make, the aforesaid repairs, the City is hereby authorized to make such repair at the Contractor's expense; providing, however, that in case of an emergency where, in the judgment of the Commissioner, delay would cause serious loss or damage, repairs may be made without notice being sent to the Contractor, and the Contractor shall pay the cost thereof.

E. The Contractor shall also furnish written guarantees as required by each Section. Length of time and requirements of guarantees are specified in each Section. Each guarantee shall commence on the date of official acceptance. Final payment will not be paid until the City receives all guarantees.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Coordination

B. Alterations

C. Cutting and Patching

D. Pre-construction Meeting

E. Pre-installation Meetings

F. Progress Meetings

1.02 COORDINATION

A. Coordinate scheduling, submittals, and Work on the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify that the City requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of appurtenance, mechanical and electrical work. Follow routing shown for pipes, and conduit, as closely as practicable; place runs parallel with line of structure. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.

E. Coordinate correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of the City of Milwaukee's activities.

1.03 ALTERATIONS

A. Materials: As specified in product Sections; match existing products and work for patching and extending work.

B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.

C. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.

D. Refinish visible existing surfaces to original condition.

E. Where new work abuts or align with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.\

F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to the City.

G. Patch or replace portions of existing surfaces that are damaged, lifted or discolored, or showing other imperfections.

H. Finish surfaces as specified in individual product Sections.

1.04 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affects:

1. Structural integrity of element.

2. Integrity of weather-exposed or moisture resistant element.

3. Efficiency, maintenance or safety of element.

4. Visual qualities of sight-exposed elements.

5. Work of City of Milwaukee or separate contractor.

C. Execute cutting, fitting and patching to complete Work, and to:

1. Fit the several parts together, to integrate with other Work.

2. Uncover Work to install or correct ill-timed work.

3. Remove and replace defective and non-conforming Work.

4. Remove samples of installed Work for testing.

5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

6. Execute work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.

7. Cut rigid materials using masonry saw or core drill.

8. Restore Work with new products in accordance with requirements of Contract Documents.

9. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

10. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

11. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

12. Identify and hazardous substance or condition exposed during the Work to the City.

1.05 PRECONSTRUCTION MEETING

A. The City will schedule a pre-construction conference after Notice of Award.

B. Attendance Required: City and Contractor.

C. Agenda

1. Submission of executed bonds and insurance certificates (unless previously submitted to DPW).

2. Submission of list of Subcontractor, list of products, Schedule of Values, and progress schedule.

3. Designation of personnel representing the parties in Contract.

4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract closeout procedures.

5. Scheduling and reports.

6. Use of premises by City and Contractor.

7. Construction facilities and controls provided by City.

8. Temporary utilities and controls provided by City, if any.

9. Security and housekeeping procedures.

10. Procedures for testing.

11. Procedures for start-up of equipment.

12. Requirements for maintaining record documents.

13. Inspection and acceptance of equipment put into service during construction period.

14. Conflicts.

15. A review of Contract Documents shall be made and deviations or differences shall be resolved.

16. Establish which areas on-site will be available for use as storage areas and working area.

1.06 PRE-INSTALLATION MEETING

A. When determined by the City, convene a pre-installation meeting at work site prior to commencing work.

B. Require attendance of parties directly affecting, or affected by, work of the specific Section.

C. Notify all parties four days in advance of meeting date.

D. Prepare agenda, preside at meetings, record minutes, and distribute copies within three days after the meeting to participants, with one copy to the City.

E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

1.07 PROGRESS MEETING

A. The City will schedule and administer meetings throughout progress of the Work as required.

B. The City will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within three days to the City, participants, and those affected by decisions made.

C. Attendance Required: Contractor’s general superintendent, major Subcontractors and suppliers, City, as appropriate to agenda topics for each meeting.

D. Agenda

1. Review minutes of previous meeting.

2. Review of Work.
3. Field observations, problems and decisions.
4. Field observations of problems that impede planned progress.
5. Review submittal schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding Work period.
10. Coordination of projected progress.
11. Maintenance of quality and Work standards of proposed changes on progress schedule and coordination.
12. Other business relating to work.

END OF SECTION

SECTION 01500

JOB SITE SECURITY, UTILITES AND FACILITIES

PART 1 SCOPE

1.01 INDEX

A. Scope

B. Security and Safety

C. City of Milwaukee Permits

D. Temporary Electricity and Lighting

E. Water for Construction

F. Sanitary Facilities

G. Temporary Fire Protection

H. Damage to Existing Property

I. Execution of Work

J. Deliveries

1.02 GENERAL CONDITIONS

A. All operations shall be carried on with a minimum of damage and disturbance. All damages shall be repaired to the original condition to the satisfaction of the Field Engineer.

B. All removals become the property of the Contractor and shall be disposed of off the site unless otherwise specified.

C. Provide and maintain temporary facilities and utilities required for construction; remove at completion of work.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements

1. National Fire Protection Association (NFPA):NFPA No. 70-93.
2. National Electrical Code (NEC) and local amendments thereto.

3. Comply with federal, state, and local codes and regulations, and utility company requirements.

1.04 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage during construction operations and demolition.

B. The contractor shall furnish, install, and maintain as long as necessary, and remove no longer required adequate barriers, warning signs or lights at all dangerous points throughout the work for protection of property, workers, and the public. The contractor shall hold the owner harmless from damage or claims arising out of any injury or damage that may be sustained by any person or persons as a result of the work under the contract.

C. Protect non-owned vehicular traffic, site and structures from damage.

1.05 PROGRESS CLEANING

A. Waste materials, debris, and rubbish shall be removed daily after work. Maintain site in a clean and orderly condition.

B. Clean and repair damage caused by removals or installations.

C. Restore existing facilities used during construction to original condition.

PART 2 SECURITY AND SAFETY

2.01 GENERAL

A. The Milwaukee Water Works consists of a number of facilities to treat and deliver drinking water to the City and surrounding suburban communities. To insure the safety and security of drinking water, the Milwaukee Water Works has instituted protocols for visitors and contractors to control entry to these facilities. It is essential that contractors strictly comply with the security policy outlined in the specification section.

B. For this project, the Contractor shall continuously coordinate building and site security measures, including accessing the site, with the designated Water Engineering representative or the Water Security Manager, Telephone # (414) 286-3465.

2.02 SCOPE

A. Any and all City agencies and contractors engaged for work at Milwaukee Water Works facilities shall be required to attend the "Pre-Construction Meeting" before any contracted work can be initiated. At this meeting, the contractor and sub-contractors shall have a detailed briefing with discussions regarding the following items:

1. Milwaukee Water Works site security policies and procedures

2. Contractor & Sub-Contractor Obligations

3. Notifying City prior to commencing work that may impact Milwaukee Water Works operations.

2.03 POLICIES

A. At the, "Pre-Construction Meeting", Milwaukee Water Works staff shall provide the Prime Contractor with site polices to be reviewed by the Prime and Sub Contractors. These documents may include:

1. Lock-out / Tag-out Policy

2. Confined Space Entry Procedures

3. Evacuation Procedure for Propane, Lox, & Ammonia Releases

4. Personal Protective Equipment Guidelines

5. No Smoking Policy

6. Prohibited Materials

B. Additionally, the Contractor will be provided:

1. Contact Phone Numbers for MWW Staff.

2. On-Site Parking Location and designated construction entrance.

3. Site security policy and procedures.

C. The Prime Contractor shall be required to review these documents and is responsible for conveying the contents of these submittals to their employees, sub-contractors and any other parties working directly or indirectly for them. These policies apply equally to all contractors. Failure to comply with established policies and procedures may result in access privileges being withdrawn.

D. MWW Staff shall provide a “walk-through” session with the contractor to review area layout and site plans as part of this orientation process and to establish the specific work areas necessary for the contractors to perform their scope of work.

Topics covered in this session include: site overview with hazards, Material Safety Data Sheets (MSDS), fire extinguisher placement and the storm water protection policy.

2.04 CONTRACTOR RESPONSIBILITIES

A. Contractors shall provide the following documents no less than 7 days prior to the start of contracted work. Documents shall be sent to the Water Security Manager, (414) 286-3465:

1. Scope of work to be performed;

2. Name of primary contractor's onsite representative;

3. Names of all companies sub-contracted to do work on the project;

4. Completed "Contract Firm Registration Form" (see attachment 'A') for prime contract firm and every sub-contract firm;

5. A "Contractor Employee Registration Form" completed for the contractors and every employee who needs to be granted site access (see attachment 'B');

6. List of items to be stored on-site;

7. Material Safety Data Sheets for all chemicals to be used/stored on-site;

B. It is the responsibility of the Primary Contractor to facilitate gathering the "Contractor Employee Registration Form" for all sub-contractors working on the project. A sub-contractor is defined as an individual or firm hired by the primary contractor to perform a specific task as part of the overall project. This would not include an organization making deliveries of supplies or equipment to the job site; procedures for these firms are covered under Part 10, "DELIVERIES".

C. In the event it is necessary for the Prime Contractor to add additional employees to the list of approved personnel, a minimum of 72 hours, or 3 business days, must be allowed for processing of the request. Site access will be denied to the additional personnel until processing is complete.

D. Contract firms are obligated to notify the Water Security Manager, (414) 286-3465 in a timely manner of any site-authorized staff that leaves the employ of the contractor.

E. Only the Primary Contractor should be contacting the Water Security Manager with issues or access requests. If a request for site access does not come from the Primary Contractor, the request will not be processed.

F. During the time period that the Contractor is on-site, they must agree to:

1. Notify the Plant Manager immediately of any significant chemical spills or leaks;

2. Maintain Normal Non-Toxic Breathable Air Quality, through Adequate Ventilation, at their work site;

3. Perform no equipment isolations or tie-ins without the signed approval of Milwaukee Water Works;

4. Restrict movement to the specific work areas within the Site to perform Contractors Scope of Work;

2.05 CONTRACTOR NOTIFICATION OF CITY

A. Contractors must notify Engineering / Site Management Staff of any welding, torching, or potentially hazardous or operational impact request, prior to commencing such operations.

B. Failure to comply with the terms of the provisions that provide for MWW Employee Safety shall be cause for the contractor to discontinue activities at the Site.

2.06 CONTRACTOR IDENTIFICATION AND DAILY REGISTRATION

A. Every day, all contractors shall be required to sign-in at the start of work and sign out at the end of work. At the end of the week, each of the daily logs from that week shall be submitted to the Water Security Manager for review.

2.07 CONTRACTOR GATE ACCESS & PARKING

A. Contractors must comply with the terms of entry for the site and park only in the areas designated for parking by the MWW site representative.

B. Parking privileges may be rescinded at any time as Site Operational Requirements dictate.

C. There is adequate space on site to allow parking of employee's vehicles.

PART 3 CITY OF MILWAUKEE PERMITS

3.01 See Chapter 2.3.0 – Necessary Notices and Permits of the Department of Public Works General Specifications for further information and requirements.

PART 4 TEMPORARY ELECTRICITY AND LIGHTING

4.01 Supply temporary lighting sufficient to enable contractor to safely access all work areas.

4.02 Electrical requirements shall be the responsibility of the contractor. No service available to contractor.

4.03 Provide, maintain, and remove temporary electric service facilities.

4.04 Facilities exposed to weather shall be weatherproof-type and electrical equipment enclosure locked to prevent access by unauthorized personnel.

4.05 Contractor pays for installation of temporary services

4.06 Patch affected surfaces and structures after temporary services have been removed.

4.07 Provide explosion-proof lamps, wiring, switches, sockets, and similar equipment required for temporary lighting and small power tools.

PART 5 WATER FOR CONSTRUCTION

5.01 Water for construction purposes is not available at the site. Water for construction purposes may be obtained from local fire hydrants. The contractor shall contact the Milwaukee Development Center (414-286-8208), to obtain a Hydrant Use permit.

5.02 Water use shall not exceed usage that might endanger the owner's water system's integrity.

PART 6 SANITARY FACILITIES

6.01 Provide temporary sanitary toilet facilities conforming to state and local health and sanitation regulations, in sufficient number for use by contractor's employees.

6.02 Maintain in sanitary condition and properly supply with toilet paper.

6.03 Remove from site before final acceptance of work.

PART 7 TEMPORARY FIRE PROTECTION

7.01 Provide and maintain in working order a minimum of two (2) fire extinguishers and such other fire protective equipment and devices as would be reasonably effective in extinguishing fires.

PART 8 DAMAGE TO EXISTING PROPERTY

8.01 Contractor is responsible for replacing or repairing damage to existing buildings, sidewalks, roads, parking lot surfacing, and other existing assets.

8.02 Owner has the option of contraction for such work and having cost deducted from contract amount if the contractor is not qualified, or fails to act in a timely manner,

PART 9 EXECUTION OF WORK

9.01 General

A. Contractor shall maintain and operate all temporary systems to ensure continuous service.

B. Contractor shall modify and extend systems as work progress requires.

9.02 Removal

A. Completely remove temporary material and equipment when no longer required.

B. Clean and repair damage caused by temporary installation or use of temporary facilities.

C. Restore existing or permanent facilities used for temporary services to specified or original condition.

PART 10 DELIVERIES

10.01 Contractor shall coordinate the delivery of all equipment, material, Dumpsters, portable toilets and other required items required for the contract work with the MWW staff. A minimum of 24 hours prior notice in advance of the desired delivery date shall be transmitted to the designated Water Engineering Representative. Contractor shall provide the following information in the notification:

A. Trucking/Delivery Company

B. Driver Name

C. Truck License Plate Number

10.02 The driver of the delivery vehicle is required to display picture identification as a pre-requisite for entry to the MWW facility for the delivery. Failure to comply with the above will result in denial of project site access, requiring the contractor to re-schedule delivery.

END OF SECTION

Milwaukee Water Works

Safe, Abundant Drinking Water.

LS-34
Attachment "A"

FORM A

CONTRACT FIRM REGISTRATION FORM

CONTRACTOR:_____

PLANT/SITE:_____

CONTRACT/SERVICE ORDER NO._____

WATER ENGINEERING PROJECT NO._____

PRIMARY CONTACT PERSON:_____

OFFICE PHONE NUMBER:_____

CELL PHONE NUMBER:_____

REQUESTED WORK HOURS (00am – 00pm): _____

NUMBER OF EMPLOYEES TO BE WORKING ON-SITE: _____

Signature certifies receipt of the materials outlined in Contract Section 01500, Part 2 – Security and Safety, Section C, Policies.

SIGNATURE:_____ DATE:_____
PRIMARY CONTACT PERSON

Accompanying this form should be a complete listing of all equipment to be stored on site for the duration of the project.

Milwaukee Water Works

Safe, Abundant Drinking Water.

LS-34
Attachment "B"

FORM B

CONTRACTOR EMPLOYEE REGISTRATION FORM

Contract Firm: _____

Plant/Site/Project: _____

Employee Name (Printed): _____

This certifies that I have received the building site security and safety policies.

EMPLOYEE
SIGNATURE: _____ DATE: _____
Required

ONSITE PARKING

☐ I will always be driving a Company vehicle.
☐ I will always be a passenger in a vehicle.
☐ I will be driving my personal vehicle. (If checked, complete and sign the next section.)

Contractor Personal Vehicle Liability Waiver

EMPLOYEE VEHICLE
MAKE & MODEL: _____ LICENSE PLATE: _____

I, hereby agree to hold harmless the City of Milwaukee for any and all damage, loss or injury, which may occur as a result of utilizing the contractor onsite parking area.

EMPLOYEE
SIGNATURE: _____ DATE: _____
Required

SECTION 01 53 43
PROTECTION of ENVIRONMENT

PART 1 – GENERAL

1.01 SUMMARY

A. Contractor in executing work shall maintain work areas on-and-off site free from environmental pollution that would be in violation of federal, state, or local regulations.

1.02 PROTECTION of SEWERS

A. Take adequate measures to prevent impairment of operation of existing sewer system. Prevent construction material, pavement, concrete, earth, or other debris from entering sewer or sewer structure.

1.03 PROTECTION of WATERWAYS

A. Observe rules and regulations of local and state agencies, and agencies of U.S. government prohibiting pollution of any lake, stream, river, or wetland by dumping of refuse, rubbish, dredge material, or debris therein.

B. Provide containment that will divert flows, including storm flows and flows created by construction activity, to prevent loss of residues and excessive silting of waterways or flooding damage to property.

C. Comply with procedures outlined in U.S. EPA manuals entitled “Guidelines for Erosion and Sedimentation Control Planning and Implementation,” Manual EPA-72-015 and “Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity,” Manual EPA 43019-73-007.

1.04 DISPOSAL of EXCESS EXCAVATED and OTHER WASTE MATERIALS

A. Dispose waste material in accordance with federal and state codes, and local zoning ordinances.

B. Unacceptable disposal sites include, but are not limited to, sites within wetland or critical habitat, and sites where disposal will have detrimental affect on surface water or groundwater quality.

C. Make arrangements for disposal subject to submission of proof to engineer that owner(s) of proposed site(s) has valid fill permit issued by appropriate government agency and submission of haul route plan, including map of proposed route(s).

D. Provide watertight conveyance for liquid, semi-liquid, or saturated solids not permitted, whether being delivered to construction site or hauled away for disposal.

Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

E. Waste generated by abrasive blast cleaning is detailed in Section 09 97 13.

1.05 PROTECTION of AIR QUALITY

A. Contain paint aerosols and V.O.C.'s by acceptable work practices.

B. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment used by contractor, and encouraging shutdown of motorized equipment not actually in use.

C. Trash burning not permitted on construction site.

D. If temporary heating devices are necessary for protection of work, they shall not cause air pollution.

1.06 PROTECTION from FUEL and SOLVENTS

A. Submit plans and photos, or drawings of all containment structures, planned paint storage procedures, planned paint mixing (as it relates to possible spillage), and paint waste disposal.

B. All required material must be submitted prior to the precon meeting. No equipment may be delivered to the site without approval of submittals.

C. The owner reserves the right to restrict equipment location.

D. Protect the ground from spills of fuel, oils, petroleum distillates, or solvents by use of containment systems.

1. Total paint, thinner, oils, and fuel delivered to and stored on-site cannot exceed supplied capacity of spill containment provided (i.e. fuel in compressor must have secondary containment to catch both fuel and oil to be sized to exceed possible spill).
2. Do not leave nozzle while fueling.
3. Provide a different containment unit under fuel tank and oil reservoirs for all equipment and fuel storage tanks.
4. Barrels of solvents, even for cleaning, are prohibited. Do not deliver paint thinners in containers greater than five (5) gallons.

E. Disposal of waste fluids shall be in conformance with federal, state, and local laws and regulations.

1.07 USE of CHEMICALS

A. Chemicals used during project construction or furnished for project operations, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification must show approval of U.S. EPA, U.S. Department of Agriculture, state, or other applicable regulatory agency.

B. Use of such chemicals and disposal of residues shall be in conformance with manufacturer's written instructions and applicable regulatory requirements.

1.08 NOISE CONTROL

A. Conduct operations to cause least annoyance to residents in vicinity of work, and comply with applicable local ordinances.

B. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.

C. Equip gasoline or oil operated equipment with silencers or mufflers on intake and exhaust lines.

D. Route vehicles carrying materials over such streets as will cause least annoyance to public and do not operate on public streets between hours of 6:00 p.m. and 7:00 a.m., or on Saturdays, Sundays, or legal holidays unless approved by owner.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.01 HAZARDOUS MATERIALS PROJECT PROCEDURES

A. Applicable Regulations:

1. RCRA, 1976 – Resource Conservation and Recovery Act: This federal statute regulates generation, transportation, treatment, storage, and disposal of hazardous waste nationally.

B. To use an off-site hazardous waste disposal facility, the contractor must use the Uniform Hazardous Waste Manifest (shipping paper).

C. Federal, state, and local laws and regulations may apply to the storage, handing, and disposal of hazardous materials and waste.

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Products.
2. Transportation and handling.
3. Storage and protection.
4. Product options.
5. Substitutions.

1.02 PRODUCTS

A. Material, machinery, components, equipment, fixtures and system shall be new. Assure standardization and uniformity by using products from one manufacturer.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

C. Provide interchangeable components of the same manufacture for components being replaced.

1.03 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct and Products are undamaged.

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement or damage.

1.04 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturer's instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive Products in weather tight, climate controlled, enclosures in an environment favorable to Product.

D. For exterior storage of fabricated Products, place on sloped supports above ground.

E. Provide off-site storage and protection when site does not permit on-site storage or protection.

F. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement or damage.

I. Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.05 PRODUCT OPTIONS

A. Products specified by reference standards or by description only: Any Product meeting those standards or description.

B. Products specified by naming one or more manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.06 SUBSTITUTIONS

A. City will consider requests for Substitutions only within 15 days after date established in Notice to Proceed.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

2. Will provide the same warranty for the Substitution as for the specified Product.

3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to City.

4. Waives claims for additional costs or time extension that may subsequently become apparent.

5. Will reimburse City for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:

1. Submit two copies of request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit shop drawings, product data and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

3. The City will notify Contractor in writing of decision to accept or reject request.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Closeout Procedures.
2. Final Cleaning.
3. Adjusting
4. Project Record Documents.
5. Operation and Maintenance Data.
6. Spare Parts and Maintenance Products
7. Guarantee

B. Related Sections

1. Section 01500 – Job Site Security, Utilities and Facilities: Progress cleaning.

1.02 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for City's review.

B. Provide submittals to City that is required by governing or other authorities.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.

1.03 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Clean site, tank and gate house; sweep paved areas, rake clean landscaped surfaces.

E. Remove waste and surplus materials, rubbish and construction facilities from the site, tank and gate house.

1.04 ADJUSTING

A. Adjust operating appurtenances and equipment to ensure smooth and unhindered operation.

1.05 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Contract Drawings.

2. Specifications.

3. Addenda.

4. Change Orders.

5. Reviewed Shop Drawings, Product Data, and Samples.

6. Manufacturer’s instructions for assembly, installation and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by City.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction including:

1. Field changes of dimension and detail.

2. Details not on original Drawings.

F. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturer’s name and product model and number.

2. Product substitutions or alternates utilized.

3. Changes made by Addenda or Change Orders.

G. Submit documents to City in the following manner:

1. Submit prior to final Application for Payment.

2. Documents shall be accompanied with a transmittal letter that includes the following:

a) Date.

b) City's project title and number.

c) Contractor's name and address.

d) Title and number of each record document.

e) Certification that each document as submitted is complete and accurate.

f) Contractor's signature or authorized representative.

3. Delete Consultant and City's title block from documents. Delete Engineer's seals from documents.

4. Submit two sets of documents.

5. Submit one set of reproducible "mylar" Contract Drawings.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit data bound in 8-1/2 x 11 inch text pages, three D-side ring binders with durable plastic covers. Drawings and diagrams shall be reduced to 8-1/2 x 11 inches or 11 x 17 inches. Where reduction is not practicable, large drawings shall be folded separately and placed in an envelope that is bound into the manuals. Envelope shall bear suitable outside identification.

B. Prepare binder cover and spine with printed title "OPERATION & MAINTENANCE INSTRUCTION", title of project, project number and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on 24 pound white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, telephone numbers and e-mails of Architect/Engineer, Contractor, Subcontractors and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, telephone numbers and e-mails of Subcontractors and suppliers. Identify the following:

    a) Significant design criteria.

    b) List of Equipment.

    c) Parts list and assembly drawings for each component.

    d) Operating instructions for start-up, normal operation, shutdown and emergency conditions.

    e) Maintenance instructions for equipment and systems.

    f) Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

    g) Troubleshooting Guide.

3. Part 3: Project documents and certificates, including the following:

    a) Shop drawings and product data.

    b) Air and water balance reports.

    c) Certificates.

    d) Photocopies of warranties.

E. Submit one draft copy of volumes 15 days prior to final inspection. This copy will be reviewed and returned with City comments. Revise content of all document sets as required prior to final submission.

F. Submit four sets of revised final volumes within 10 days after receipt of City's comments.

1.07 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

1.08 WARRANTY AND GUARANTEE

A. Provide duplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, suppliers and manufacturers.

C. Provide Table of Contents and assemble in binder with durable plastic cover.

D. Submit prior to final Application for Payment.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02683

DISINFECTION OF WATER STORAGE TANK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Disinfection of water storage tank.

1.02 REFERENCES

A. AWWA C652-02 – Disinfection of Water Storage Facilities.

B. ANSI/AWWA B300 – Hypochlorites.

1.03 SUBMITTALS

A. Submit under provisions of Section 01010 – Summary of Work.

B. Product Data:

1. Submit manufacturer's descriptive literature and product specifications for each product.

C. Schedule and duration of disinfection operations.

D. Calculations for determining the quantity of chlorine required to achieve available chlorine solutions of 200-mg/L and 10-mg/L.

1.04 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of Section 01600 – Material and Equipment.

1.05 OWNER RESPONSIBILITY

A. Draw samples and test after chlorination; responsibility of good results remains with the contractor. Poor test results could result in added costs to contractor, including rechlorination, cost of water, plus liquidated damages.

PART 2 PRODUCTS

2.01 ACCEPTABLE FORMS OF CHLORINE

A. Sodium hypochlorite shall conform to ANSI/AWWA B300.

B. Calcium hypochlorite shall conform to ANSI/AWWA B300.

PART 3 EXECUTION

3.01 GENERAL

A. Cleaning and chlorination of the tank shall not commence until paint has cured, but in no instance sooner than 7 days after the final coating has been applied.

B. Cost is incidental to interior-wet painting.

3.02 PREPARATION

A. City shall operate the necessary valves so potable water can be admitted to the storage tank. The contractor shall not operate valves under any circumstances.

3.03 DISINFECTION

A. A. Disinfect the completely painted structure in accordance with AWWA Standard C652 Chlorination Method No. 3.

B. Furnish the material and labor necessary to disinfect the structure in the required manner. Assist owner during filling and sampling. Promptly repair any defects in the work that may appear.

C. Do not allow water to enter the distribution system until the structure is proven chemically and bacteriologically safe.

D. Water vented to waste may not contain any substances in concentrations that can adversely affect the natural environment. No total residual chlorine may be measured in water discharged to surface water.

E. Pay all additional expenses if it is necessary to repeat the testing and disinfection procedure as a result of defective work or defective testing.

3.04 TESTING

A. The City will fill the storage tank to its overflow level with potable water. Once the tank reaches its overflow level, the City will take one (1) water sample. A second

water sample will be taken 24-hours after the first sample was taken. Results from these two tests will be available 36 hours after the second sample is collected.

B. The water samples will be tested for coliform organisms, available chlorine, threshold odor number and taste in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater. If the test for coliform organisms is negative, then the storage facility may be placed in service. If the test shows the presence of coliform bacteria, objectionable taste or odor, then the situation will be evaluated by the City. In any event, repeat samples shall be taken until two (2) samples collected 24 hours apart are negative, or the storage facility shall again be subjected to disinfection.

END OF SECTION

SECTION 03 01 00.1
FOUNDATION REPAIRS

PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Repair of concrete foundation.

1.02 WORK INCLUDED
A. Sealing of the baseplate gap with caulking.

1.03 SUBMITTALS
A. Submit the following within three weeks after the Notice to Proceed is issued.
   1. Material Safety Data Sheets (MSDS) and Product Data Sheets:
      a. Furnish from all suppliers Material Safety Data Sheets and product data sheets for all applicable materials including, but not limited to, concrete, grouts admixtures, sealers.
      b. Provide for employees one (1) copy of all data sheets at the job site for employee access.
      c. Provide two (2) copies to the owner.
      d. Provide two (2) copies to the engineer.
      e. No work may commence without the complete filing. All MSDS shall conform to requirements of SARA Right-to-Know Act.

PART 2 – PRODUCTS

2.06 FOUNDATION/BASEPLATE SEALANT
A. Sikaflex 1a for joints a maximum of 1 in. deep as manufactured by Sika Corporation.
B. Sikaflex 2c for joints of depths greater than 1 in. as manufactured by Sika Corporation.
C. Backer rod, where required, use ITP standard closed cell polyethylene foam manufactured by Industrial Thermo Polymers, Ltd., 2316 Delaware Ave., Suite 216, Buffalo, NY 14216, 1-800-387-3847.

PART 3 – EXECUTION

3.01 BASEPLATE/FOUNDATION SEALANT REPAIR

A. Excavate around the foundation (approximately 6 inches of soil to be removed.
B. Remove all loose sealant, felt, dirt, and all foreign material from between the baseplate and the concrete foundation by hand, chisel, and by low pressure water cleaning at 4,000 psi.
C. Apply sealant into the gap and tool by hand to make smooth.
D. Use backer rod if the gap is more than ½ in. deep.
E. Sealant is to be applied around the entire circumference of the tank's baseplate.
F. Foundation to be coated per these specifications and soil backfilled leaving a minimum of 2 inches of the face exposed.
G. Payment is a separate line item "Foundation Sealant" which the owner reserves the right to delete.

3.02 REGRADE AROUND FOUNDATIONS

A. After foundation repairs and coating is completed, regrade soil so that site drainage runs away from the tank.
B. Finished grade around tank shall slope away from tank. Surface drainage shall drain away from tank and not be allowed to pond around tanks perimeter.
C. Site restoration to be completed per Section 09 97 13.
D. Cost is incidental to exterior repainting.

SECTION 05 00 00
METAL REPAIRS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Steel Repair.
B. Surface Preparation of Lead Paint before Welding.

1.02 REFERENCES
A. AWWA D100 Weld Standard
B. AWS Weld Standard
C. API 650 Standard

1.03 OMISSIONS
A. The specifications include all work and materials necessary for completion of the work. Any incidental item(s) of material, labor, or detail(s) required for the proper execution and completion of the work are included.

1.04 DEFINITIONS
A. Ground Flush: Ground even with adjacent metal, no transition.
B. Ground Smooth: Ground welds to the point that no cuts or scratches occur when rubbing your hand over the weld. Rebuild with weld any concavity discovered during grinding.

1.05 WORK INCLUDED
A. Install 30-inch sidewall manway and hinge.
B. Replace manway gasket.
C. Replace 30-inch wet interior roof hatch.
D. Replace exterior sidewall ladder.
E. Repair roof vent panel.
F. Install cathodic clips and coupling.
G. Install safety railing with step-off platform on the roof.
H. Install rigging couplings with safety clips.
I. Install handholds on the roof cupola.

1.06 WORKMANSHIP
A. Provide material and workmanship necessary to produce a first class job.
B. Complete work in a manner that is least offensive to neighbors.

1.07 WELDER QUALIFICATIONS

A. Certified for type and position of weld specified.
B. The welder shall be specialized in industrial or heavy commercial welding, and experienced in rigging and elevated work.

1.08 SUBMITTALS

A. Material Safety Data Sheets (MSDS) – for all items as required by law.
B. Welder's Certification.
C. Submit materials within three weeks after Notice to Proceed is issued.

1.09 WORK SEQUENCING

A. The following is NOT a ways-and-means decision of the contractor. It is accepted and good painting practice:
   1. Complete ahead of all cutting and welding all surface preparation, such as immediate area lead paint removal.
   2. Complete all welding repairs prior to commencement of any power washing or abrasive blast cleaning.
   3. Do not install new fall prevention devices until all painting has been completed. Supply temporary fall prevention devices with steel cables during blasting and painting.

PART 2 – PRODUCTS

2.01 STEEL PLATING and OTHER STRUCTURAL SHAPES

A. ASTM – A36.

2.02 BOLTS and NUTS

A. Stainless Steel
   1. ASTM F594G – 316 Stainless Steel Bolts.
   2. ASTM F594G – 316 Stainless Steel Nuts.
B. Galvanized Steel
   1. ASTM A307 Grade A zinc coated Steel Bolts.
   2. ASTM A307 Grade A zinc coated Nuts.

2.03 WELDS

A. Final – E70XX Electrodes.
B. Root – E60XX Electrodes.
C. Wire – ER70S Electrodes.

2.04 FALL PREVENTION DEVICE

A. Cable-Type as manufactured by DBI Sala of Red Wing, MN 1-941-894-0564.
   1. Fall prevention system: Lad-Saf Model and all connecting clips, etc.
      a. Cable to be 3/8 in. galvanized steel.
      b. Top Bracket: TB-2 #6116056 for vertical ladders with no obstruction so cable extends above the ladder.
      c. Bottom Bracket BB-1 #6100090.
      d. Cable Glides CG-3 #6100400.

2.05 CATHODIC CLIPS and COUPLING

A. Corrpro clips and coupling for interior, buoyant-type cathodic protection system 1-866-CORRPRO.

2.06 VANDAL GUARD

A. RB Industries Ladder Gate Climb Prevention Shield, P.O. Box 4734 Greensboro, NC 27404-4734 (336) 852-6276.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION – PREWELDING – LEAD PAINT

A. The existing wet interior coating is known to contain lead.
B. Remove all coating 6 in. on both sides of welding area by abrasive blast cleaning or vacuum shrouded power tool cleaning prior to any cutting, welding, or disturbance of the lead paint.
C. Chemical stripping or other method may be approved by the engineer.
D. Absolutely do not begin any repair work until all adjacent lead is properly removed, cleaned, and stored.

3.02 CUTTING ACCESS for REPAIRS or PAINTING

A. If the contractor determines that it is necessary to cut a hole in the roof or sidewall for equipment access, submit the desired location and size of opening to the City for review and authorization. Do not cut any steel without authorization.
B. Sidewall reservoir door sheets shall be cut a minimum of 3 inches above the floor, to provide clearance for attachment of radiographic film on the bottom weld seam.
C. The submittal drawing of the cut and repair method shall be sealed by a Professional Engineer registered in the State of Wisconsin. The submittal can be completed by any competent, registered engineer.

D. Cutting access is recognized as a cost effective method to allow entry of large equipment into the tank. Cutting, however; creates additional inspection fees that the City would not have to pay if a contractor did not cut access. These costs include inspection during x-rays and review of x-ray technician's interpretation of x-rays, inspection of surface preparation of interior and exterior, and inspection of primer and each subsequent coat of paint.
E. Contractors that intend to cut a hole in the roof or sidewall of tank for equipment access shall retain the services of Dixon Engineering, Inc., 9415 West Forest Home, Suite 208, Hales Corners, Wisconsin, 53130, (414) 529-1859 to perform review of proposed opening and inspection of repair as called out in this section. Failed inspections will be treated as detailed elsewhere in these specifications.
F. Repair coatings per Section 09 97 13.
G. Cost is the responsibility of the contractor.

3.03 RADIOGRAPHS - ACCESS OPENING REPLACEMENT

A. Furnish all radiographic equipment, film, personnel, etc. necessary to perform radiographic inspection of completed welds in accordance with AWWA D100-11. Radiographic testing firm shall be approved by the City.
B. A minimum of four (4) radiographs will be required.
C. The radiographs will all be taken in one day at locations identified by the City's representative, and in the presence of the City's representative.
D. The radiographs will be developed on-site by the radiographer, and interpreted by the radiographer, but reviewed by the City's engineer.
E. All developed film will become property of the City.
F. Cost for radiographic examination is the responsibility of the contractor.
G. Cost for additional radiographic examination and inspection due to failed x-rays is also the responsibility of the contractor.

3.04 30" BOLTED SIDEWALL MANWAY & HINGE

A. Install a 30 in. diameter manway in the tank's sidewall.
B. Remove all slag, spatter, and rough welds by grinding smooth.
C. Install new ⅜ in. flat neoprene gasket material.
D. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
E. See Drawing LS-34-03
F. Payment is a separate line item "30-inch Bolted Sidewall Manway and Hinge" which the owner reserves the right to delete.

3.05 REPLACE SIDEWALL MANWAY GASKETS

A. Replace the 3 sidewall manway gaskets with new ⅜ in. flat neoprene gasket material.
B. Payment is incidental to wet interior painting.

3.06 30" WET INTERIOR ROOF HATCH

A. Remove the existing wet interior hatch and cover with frame. All removed items to be ground flush with roof plates.
B. Hatch to become property of the contractor for proper disposal.
C. Furnish and install a 30 in. diameter hinged hatch.
D. Weld a 3/16 inch thick reinforcement plate, diameter to be sufficient to overlap any openings. Weld using ¼ in. full fillet welds.
E. Weld a 6 in. x 3 in. x ⅝ in. diameter rung on the roof for a hand-hold. Location to be determined by the engineer.
F. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
G. See Drawing LS-34-03.
H. Payment is a separate line item "30-inch Wet Interior Roof Hatch" which the owner reserves the right to delete.

3.07 EXTERIOR SIDEWALL LADDER

A. Remove the existing sidewall ladder. Ladder to become property of the contractor for proper disposal. In the event the base metal is gouged during ladder removal, the affected areas are to be built-up to original steel thickness. Grind built-up areas flush with adjacent surfaces.
B. Furnish and install new sidewall ladder starting 10 ft. above the foundation.
C. Ladder to be 16 in. wide with ¾ in. diameter rungs, spaced every 12 in. on center, and provide a minimum of 7 in. toe clearance.
D. Construct side rails of 2 in. x ⅜ in. flat bar stock. Spacing on ladder brackets is 10 ft. maximum with brackets 8 in. from each end.
E. Ladder shall meet or exceed all OSHA requirements. Equip with cable-type fall prevention device.
F. Install a vandal guard per the manufacturer's recommendations. Center the vandal guard at the struts.
G. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
H. See Drawing LS-34-03.
I. Payment is a separate line item "Exterior Sidewall Ladder" which the owner reserves the right to delete.

3.08 CUPOLA ROOF VENT REPAIR

A. The roof vent consists of several screened frames attached to a cupola. One of the frames is bent.
B. Remove the bent screen and bend straight so there is no gap when reinstalled.
C. Reinstall the vent frame onto the cupola.
D. Replace all screen material with new stainless steel screen of the existing mesh size.
E. Cost is incidental to exterior painting.

3.09 CATHODIC CLIPS and COUPLING

A. Weld cathodic clips on the tank's interior.
B. Supply recommended quantity, and locate as shown on drawing LS-34-02.
C. Weld clips with ¼ in. fillet welds all around. No area may be left that may be susceptible to crevice corrosion.
D. Weld a 3,000 psi coupling inside and outside with a ¼ in. fillet weld all around, and cap fitting as directed by supplier. Provide Ice Guard.
E. Remove all slag and spatter. Grind all welds smooth.
F. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
G. Payment is a separate line item "Cathodic Clips and Coupling" which the owner reserves the right to delete.

3.10 SAFETY RAILING and STEP-OFF PLATFORM

A. Furnish and install a new safety railing along the edge of the roof at the sidewall ladder with a step-off platform and one railing section that runs up to the vent at the center of the roof.
B. Use 2.5 in. x 2.5 in. x ¼ in. angle iron for the vertical posts, supports, top rail, and mid-rail.
C. Use 4 in. x ¼ in. steel plate for the kick plate.
D. Use 6 in. x 6 in. x ¼ in. steel plates for the base-plates.
E. All welds will be $^{3}/_{16}$ in. fillet welds.
F. Comply with OSHA Standard 1910.23 for hand rail installation, and all other applicable federal, state, and local codes.
G. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
H. See Drawing LS-34-03.
I. Payment is a separate line item "Safety Railing and Step-off Platform" which the owner reserves the right to delete.

3.11 RIGGING COUPLINGS

A. Install extra heavy couplings spaced approximately every 12 ft. with two rings located approximately 30 ft. and 60 ft. from the center of the roof. Install 8 couplings in the inner ring and 15 in the outer ring.
B. Couplings to be plugged with brass hex head plugs, couplings and plugs to be threaded per NPT standard.
C. Install per Drawing LS-34-03.
D. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
E. Cost is incidental to wet interior painting.

3.12 HANDHOLDS

A. Install handholds on the existing cupola roof located at the center of the water storage tank.
B. Handholds to be installed every 5 ft. on center maximum.
C. Install per Detail on Drawing LS-34-02.
D. Surface prepare and coat in accordance with Sections 09 97 13 and 09 97 13.10.
E. Cost is incidental to the project.

PART 4 – SPECIAL PROVISIONS

4.01 PAINT REPAIR – STEEL REPLACEMENT

A. All large pieces of steel to be shop primed using the specified prime coat over a SSPC-SP10 near white surface preparation.
B. Do not prime 3 in. from area to be welded.
C. After installation, spot clean welded areas to a SSPC-SP11 and apply coating as specified.
D. Use only one manufacturer for repairs.
E. Cost is incidental to metal repairs.

SECTION 09 97 13
STEEL COATING

PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Painting of steel structures.
B. Interior Cleaning and Disinfection

1.02 REFERENCES
A. AWWA Standards:
1. D102 – 11 Painting Steel Water Storage Tanks.
2. C652 – Disinfection of Water Storage Facilities

1.03 WORK INCLUDED
A. Exterior: Apply a four (4) coat epoxy urethane system with a zinc primer.
B. Wet Interior: Apply a three (3) coat zinc epoxy system. Alternate system: Two (2) coat zinc/100% solids epoxy system.

1.04 EXISTING CONDITIONS
A. Exterior: Unknown coating system (likely an alkyd) tested for lead at up to 0.044% and chrome at up to 0.02% by weight.
B. Wet Interior: Grease system with lead primer tested at 0.41% and chrome at up to 0.01% by weight.

1.05 OMISSIONS or INCIDENTAL ITEMS
A. It is the intent of these specifications to coat the structure for the purpose of corrosion protection on wet interior surfaces. It is the intent to coat the exterior for corrosion protection and aesthetics.
B. Any small or incidental items not specifically detailed in the schedule, but obviously a part of the work are included in the work at no additional cost to the owner.
C. Engineer, as interpreter of the specifications, will determine if disputed items fall under this category. Prevailing custom and trade practices will be considered in this determination.

1.06 SUBMITTALS

A. Submit the following with your annual prequalification:
    1. Occupational Safety and Health Programs and certification that all site personnel have been trained as required by law.

B. Submit the following three weeks after Notice to Proceed is issued:
    1. Material Safety Data Sheets (MSDS) and Product Data Sheets:
        a. Furnish from all suppliers Material Safety Data Sheets and product data sheets for all applicable materials including, but not limited to, paints, thinners, tank cleaners, degreasers, and abrasive materials.
        b. Provide for employees one (1) copy of all data sheets at the job site for employee access.
        c. Provide two (2) copies to the owner.
        d. Provide two (2) copies to the engineer.
        e. No work may commence without the complete filing. All MSDS shall conform to requirements of SARA Right-to-Know Act.
    2. Ventilation Design Plan. Include airflow calculations and model, and number of fans.
    3. Dehumidification/Heat Design Plan. Include airflow calculations, model, number of units used, connection details, and power source.
    4. Fall Prevention Plan and Site Specific Fall Hazard Evaluation:
        a. Site specific plan to contain a generic drawing of the existing structure and appurtenances of this tank and reflect safety changes specified for this project.
        b. Certifications for all spiders, scaffolding, stages, etc. to be used on the project. All certifications to be current, less than one year old.

C. Submit the following at the preconstruction meeting:
    1. Designated OSHA Competent Person and qualifications, if not previously submitted.
    2. Waste hauler and disposal facility.
    3. Submit all power tools and attachments to be used during the project.

D. Submit the following within two (2) weeks of completion with final pay request:
    1. Waste manifest.
    2. Waivers of lien.
    3. Copies of any formal worker safety or environmental citations received on the project.

1.07 OWNER RESPONSIBILITY

A. Drain the tank with seven (7) days notice, after contractor meets all precedent conditions of the contract.

1.08 WARRANTY

A. Approximately one (1) year from the date of substantial completion, the tank will be inspected by the owner and/or his representative.
B. The inspection will be performed in accordance with the applicable portions of AWWA D-102-11 Standard for Painting Steel Water Storage Tanks and industry standards.
C. The owner will establish a date of inspection and shall notify the contractor ten (10) days in advance. The contractor's attendance will not be required.
D. The owner will select a third party inspection firm (either engineer or project representative) to document inspection. Contractor shall be notified in advance by the Engineer, the contractor waives all rights to dispute findings if not present for the inspection.
E. Any failed work will be documented and the contractor will be notified of necessary repair (method and extent). The owner reserves the right to require inspection of the repair work and possibly a second warranty inspection, dependent on degree of failure.
F. Except where noted in the Contract Documents, the contractor guarantees all material and equipment furnished and all work performed for a period of one (1) year from the date of substantial completion of the contract. This warranty will automatically be extended until the tank is ice-free (if applicable) and the warranty inspection can be performed. The contractor guarantees that the system is free from defects due to faulty materials or workmanship and the contractor shall make the necessary correction to correct these defects. If the amount of rework exceeds ten percent (10%) of a portion of the project, then the owner reserves the right to have the warranty period extended one (1) year for the entire portion of the work.
G. Cost for one (1) year warranty inspection will be the responsibility of the owner.
H. Cost for a second warranty inspection and repair inspections will be the responsibility of the contractor and guaranteed by Contractor's Performance Bond.
I. The owner retains all contractual remedies. The warranty shall not be considered an exclusive remedy.

1.09 DELIVERY and STORAGE of MATERIAL

A. Submit manufacturer's invoice, with or without paint cost, to the engineer for review. This submittal will be used to identify the quantity of paint recommended by the manufacturer for a job of this size and design, and will be used to check the quantity actually delivered to the project.
B. Cover bulk materials subject to deterioration because of dampness, weather, or contamination, and protect while in storage.

C. Maintain materials in original, sealed containers, unopened and with labels plainly indicating the manufacturer's name, brand, type, grade of material, and batch numbers.
D. Remove from the work site containers that are broken, opened, water marked, and/or contain caked, lumpy, or otherwise damaged materials. They are unacceptable.
E. Store the material in a climate controlled designated area where the temperature will not exceed the manufacturer's storage recommendations. Heat the storage area to the manufacturer's recommended minimum mixing temperature.
F. Keep equipment stored outdoors from contact with the ground, away from areas subject to flooding, and covered with weatherproof plastic sheeting or tarpaulins.
G. Store all painting materials in a location outside the tank.
H. Do not store or have on-site unapproved material, material from different manufacturers, or materials from different projects.

1.10 ACCESS and INSPECTOR SAFETY

A. Provide access to all portions of the project where work is being completed. Access must be close enough and secure enough to allow inspector to use inspection equipment without extensions.
B. Provide personnel to assist with access and to ensure contractor's access equipment is safely used.
C. Provide separate fall protection for owner and inspectors. Limit fall to 5 ft. vertically.
D. New safety tie-off points have been added (as part of this project – see Section 05 00 00 Metal Repairs) to the interior roof for interior safety and the bowl for safety lines under the exterior bowl. Do not rig equipment from these points. Provide separate fall protection cables and safety grabs for each tie-off point.
E. These specifications require the contractor to supply a separate fall protection cable and safety grab for each tie-off point for the inspector's use. The contractor is encouraged to provide a separate cable and tie-off for each of his personnel. The cables may be connected to the same tie-off point as the inspector's, but a separate cable and safety grab are required for each user.
F. See Section 05 00 00 for specific locations of safety line tie-off points.

1.11 INSPECTION and TESTING

A. Prior to the scheduled inspection, remove all dust, spent abrasive, and foreign material from the surface to be coated.
B. Furnish an instrument for measuring the wet film thickness, and also dry film thickness of each field coat of paint. The dry film thickness testing gauge shall be the magnetic type as manufactured by Elcometer Co., or the Nordson Gauge Co.;

spring loaded model with two percent (2%) accuracy margin over a range of one-to-twenty-one (1-21) mils or equal.

C. Certify to the owner that the specified paint has been applied at the paint manufacturer's recommended coverage, and to the specified thickness required. Also, certify that the paint has been applied in accordance with this contract.
D. Take all necessary steps, including dry striping by brush or roller, to ensure a holiday-free coating system.
E. The owner reserves the right to perform low voltage holiday tests on all areas including the exterior. The interior coatings are subject to low voltage holiday testing.
F. The owner and engineer reserve the right to perform destructive testing under conditions deemed necessary. Testing may include, but is not limited to, the Tooke thickness test and adhesion testing. Any damage caused by these tests will be corrected to specifications at the contractor's expense.

1.12 CLIMATIC CONDITIONS

A. Do not apply paint when the temperature, as measured in the shade, is below the manufacturer's required ambient and surface temperatures.
B. Do not apply paint to wet or damp surfaces, or during rain, snow, or fog.
C. Do not apply paint when it is expected the relative humidity will exceed 85%, or the surface temperature is less than 5º above dew point, or the air temperature will drop below the manufacturer's requirements for proper cure. Anticipate dew or moisture condensation, and if such conditions are prevalent, delay painting until the owner is satisfied the surfaces are dry.

1.13 APPLICATION

A. Complete all painting and surface preparation in strict accordance with these specifications, approved paint manufacturer's specifications, and good painting practices per SSPC.
B. Apply each coating at the rate and in the manner specified by the manufacturer. Check the wet film thickness every 200 sq. ft. to ensure each coat applied meets the dry film thickness range requirements.
C. Allow sufficient time for each coat of paint to dry and cure. Allow a minimum of twenty-four (24) hours between coats, unless product requirements have a maximum time less than 24 hours.
D. Apply exterior coating by brush and roller only. Spray application is not permitted without prior approval of the engineer. Even with prior approval, responsibility for damage still remains with the contractor.
E. Painting may be delayed because of poor coverage, the possibility of paint drying too rapidly, or the potential damage from overspray and/or dry spray. In all cases, responsibility for damages rests with the contractor.

F. The contractor is responsible for the appearance of the finished project, and is warned to prevent contact with any freshly applied coating. Removal of rigging shall be completed so not to mar or damage the coating.
G. Coatings shall be applied using methods to eliminate roller or spray marks in the finished product on the exterior.
H. Stripe the wet interior prior to application of final coat.
I. Additional coats required for coverage or to eliminate roller marks, spray marks and to repair dry spray and overspray are the responsibility of the contractor at no additional cost to the owner.
J. Use of pole extension on spray guns is prohibited for all paint application.
K. Mixing of partial kits is not permitted. All partial cans of coating must be removed from the site.
L. Mixing blades to be clean. The engineer has the right to reject mixing blades based on cleanliness or paint build-up. Do not use the same mixing blade for different coatings (i.e. epoxy and urethane coatings).

PART 2 – PRODUCTS

2.01 COLOR

A. Supply the engineer with a color chart to allow the owner ample time for the exterior topcoat color selection.
B. Factory tint the intermediate coat(s) for all areas of the structure if similar to the finish coat. Tinting shall be sufficient to allow visibility of the dissimilar color from 1 ft., and from 100 ft.
C. After evaluating the bids, the owner shall select the color. The owner recognizes the additional cost for deep color paints. All bids shall be based on Tnemec "Tank White" color or equivalent color. After the color has been selected, document the difference in cost and quantity used for the selected color and the owner will issue a Change Order for the exact cost differential only.
D. Documentation of additional cost is the responsibility of the contractor, and must be supplied two (2) weeks before application. If necessary documentation is not supplied, any additional cost will be borne by the contractor. If selection/application time is less than two (2) weeks, then as soon as possible. The owner has the right to switch to a less expensive color; therefore, the contractor must submit cost before ordering paint.

2.02 SUBSTITUTIONS

A. All coatings specified and approved herein have met or exceeded a specified list of ASTM standards. The materials specified are the standard to which all others shall be compared.
B. The purpose is to establish a standard of design and quality, and not to limit competition.
C. Other manufacturers wishing to have alternate products approved, shall submit to the engineer for approval. Do not base bids on costs for products not already approved by the engineer.
D. Approval by ANSI/NSF Standard 61 is also a requirement for potable water contact coatings.
E. The selection of coatings also has taken into consideration the manufacturer's current and past performance on availability, stocking, and shipping capabilities, ability to resolve disputes, and any applicable warranties.

2.03 DEHUMIDIFICATION and HEATING – WET INTERIOR

A. Supply dehumidification/heating units capable of maintaining dew point temperature lower than 15º below surface temperature during blasting and lower than 5º during coating application and cure, and steel temperature maintained above the manufacturer's printed requirements.
B. Supply a dehumidifier designed with a solid desiccant having a single rotary desiccant bed capable of continuous operation, with full automatic operation. Do not use liquid desiccant, granular, or loose lithium chloride drying systems. Refrigerant systems may be used in conjunction with desiccant units.
C. Plumbing, noise control, insulation, venting, and all incidental items needed to provide proper ambient conditions shall be included as one package.
D. Supply and maintain a power source for the dehumidifier.

2.04 DUST COLLECTORS – AIR FILTRATION UNITS

A. Furnish and use a dust collector during all blasting work.
B. Units to be equal in filtration capacity to Eagle Industries dust collectors. Other units may be used, but their substitution will be evaluated on efficiency at 0.5 micron size and airflow movement.
C. Use 60,000 cfm minimum for all wet interior work.
D. Substitution of steel grit blasting may decrease the requirements above. New requirements will be defined by the engineer based on the efficiency of the contractor's equipment.
E. Furnish HEPA filters for dust collection.

F. Number of dust collectors shall be sufficient to supply a 50 ft./minute downward draft at most areas. An average may be considered. Determination of actual containment plan will be the deciding factor. Calculations of airflow shall be included in the containment submittal.
G. Use only new filters or filters certified clean.

2.05 GROUND TARPS

A. Use impermeable ground tarps, 20 mils thick.
B. Use ground tarps able to withstand the anticipated construction traffic without tearing or separating.

2.06 EQUIPMENT COVERING

A. Use material that is 8 – 10 mils thick, and 100% impermeable to cover pumps, motors, and other vulnerable equipment.
B. Use material resistant to tear and/or rip by mechanical action from abrasive blasting during blasting operations.
C. Make coverings airtight by use of duct tape at the openings, or other suitable measures.
D. Meet with representative of equipment owner to verify covering will not damage equipment. Damage is the contractor's responsibility. This includes not only the owner's equipment, but also telecommunication antennas, cables, buildings, controls, etc.

2.07 AIR DRYER for COMPRESSOR

A. Use air dryers sufficient to remove 98% of the moisture from the compressed air. Size the dryers on total cfm using manufacturer supplied charts. Upon request, supply charts to engineer for verification.
B. If the fan is not operable, cease all blasting until the dryer is replaced or repaired.
C. Supply air dryer with an air draw-off valve to check air for dryness, oil contamination, and cleanliness on the outlet side of the air dryer.
D. For cleaning operations, draw clean air from the outlet side of the air dryer.

PART 3 – EXECUTION

3.01 PROTECTION of NON-WORK AREAS

A. Protect all non-blasted/painted surfaces prior to all abrasive blast cleaning/painting.
B. Thoroughly cover the fill/drain pipe, overflow pipe, and all other openings. Do not permit abrasive or paint chips to enter into the piping or distribution system. Use watertight seals on the pipes.
C. Protect and seal all controls and electrical components (even if they are not in the immediate work area) that are in danger from the project. Coordinate with the owner so all controls are shut down and/or vented if necessary.
D. Cover the pit with boards and tarping to prevent debris from entering. Remove all debris, spent abrasive, etc. from the pit at project completion.

3.02 DEHUMIDIFICATION/HEATING

A. Control the environment with dehumidification equipment twenty-four (24) hours a day during blast cleaning, coating operations, and cure time. Maintain minimum ambient conditions until cure completion.
B. Supply sufficient dry air to assure the air adjacent to surfaces to be abrasive blast cleaned or coated does not exceed minimum required humidity at any time during the blasting, coating, or curing cycle.
C. Monitor and record ambient conditions twenty-four (24) hours a day throughout abrasive blast cleaning and painting work. Dehumidification equipment to be equipped with Munters ExactAire monitors. Monitor to be capable of being programmed with condition parameters and of alerting use/owner via phone, fax, pager, or e-mail of condition or equipment failures. An approved monitoring device may be used instead of Munters ExactAire system, Dickson Model TH6, or equivalent. Hour meters shall be provided to verify 24 hour system operation.
D. Test interior ambient conditions three (3) times a day, or more often with rapid weather changes. Record daily readings. Adjust or add equipment as required to maintain steel temperatures, dew point, and humidity. (This is a check on and in addition to the recorder in paragraph C above.)
E. Use a minimum 11,250 cfm dehumidification unit for all interior work.
F. The contractor may subdivide the interior into smaller sections to reduce dehumidification requirements.
G. Surround the units with noise suppressant enclosures, unless units are sound attenuated or have noise suppressants. More extensive enclosure requirements are required in residential areas where the machines must run all night. Noise suppressant level needed will depend on the size of the dehumidification units, their efficiency, and their locations. Provide noise suppressant enclosures of

sufficient height and thickness to lower noise to an acceptable level for neighbors. Also provide noise suppressant enclosures for generators.

H. Auxiliary heaters may be necessary to maintain the surface temperature at a level acceptable to the coating manufacturer's application parameters. The auxiliary equipment must be approved for use by the manufacturer of the dehumidification equipment and shall meet the following requirements. Auxiliary ventilation equipment and/or dust collection equipment can affect the exchange rate.
    1. Heaters shall be installed in the process air supply duct between the dehumidifier and the work, as close to the work as possible. Air heaters are not acceptable as a substitute for dehumidification.
    2. Use only electric or indirect gas fired auxiliary heaters. No direct fired space heaters will be allowed during blasting, coating, or curing phase.

I. Seal off the work, allowing air to escape at the bottom of the space away from the point where the dehumidified air is being introduced. Maintain a slight positive pressure in the work unless the dust from the blasting operation is hazardous.

J. Where necessary to filter the air escaping the space, design the filtration system to match the air volume of the dehumidification equipment in such a way that it will not interfere with the dehumidification equipment's capacity to control the space as described herein. Do not recirculate the air from the work or from filtration equipment back through the dehumidifier when coating or solvent vapors are present. Outside air is to be used during those periods.

K. Securely attach duct work to the equipment and work to minimize air loss. Design hoses with sufficient capacity and minimal bends to reduce friction loss.

L. Dehumidification and its operating power source are incidental to the respective painting project (wet or dry interior).

M. Set-up and operate equipment twenty-four (24) hours (or earlier) prior to start of blasting, and twenty-four (24) hours after all water has been removed from the tank.

3.03 DUST CONTAINMENT – INTERIOR

A. Do everything within the contractor's power to minimize dust as a nuisance.

B. No visible dust release is allowed from roof openings and other access openings. Seal or close all openings prior to blasting (see ventilation requirements).

C. Connect the air filtration unit directly to a manhole extension.

D. Design the manhole extension to allow access of hoses through a side exit that is sealable after hoses are in-place. Install the air filtration unit directly to the end of the extension.

E. Seal of the side exit will be tested by holding a lit cigarette 6 in. outside the seal with the air filtration unit operating. If smoke is drawn to the seal area, additional sealing will be necessary.

F. The contractor may reverse this operation by connecting the air filtration unit to the roof manhole and sealing around the hose. Also seal the roof vent. A sealed semi-rigid structure also may be used where employees have access through a side door. 90% of the air draw must be from the tank proper.
G. Construct the semi-rigid structure from 8 ft. x 8 ft. x 6 ft. high scaffold framing and cover with tarps, with all edges lapped 2 ft. minimum and an overlapped entranceway.

3.04 VENTILATION REQUIREMENTS

A. Supply mechanical ventilation sufficient to change air in the tank six (6) times each hour.
B. In calculating air exchange, the dust collector air capacity can be considered a part of the air being changed up to 50% of ventilation requirements.
C. Use roof, riser, access tube or sidewall manholes with fans to move the required air.
D. Ventilate wet interior areas a minimum of seven (7) days after completion of painting, or longer until the wet interior coating has fully cured. Maintain ventilation at the rate of two (2) complete air changes per hour.
E. Cost of ventilation is incidental to respective paint project.
F. Additional ventilation openings may have to be installed by the contractor. Submit size, details, and location(s) for approval by the owner prior to cutting any opening. All costs associated with repairs by a certified welder are incidental
G. (Ventilation with exterior containment): All fans must blow into the structure unless the exterior containment is fully deployed. Air filtration unit for the exterior must be operating.
H. (Ventilation without exterior containment): Connect the air filtration unit per this Section, Dust Containment – Interior. All fans on the roof and sidewalls must blow in. If all openings are not needed for ventilation, seal them. Zero release to the atmosphere will be permitted.

3.05 HAND WASH FACILITY

A. Provide OSHA approved hand wash facility with running water. Hot water is <u>not</u> required.
B. Stock facility with soap and towels, and keep supply replenished.
C. Test water and dispose of properly after job is completed.

3.06 LIGHTING of WORK SPACE

A. Provide durable lighting fixtures designed for the intended work environment for use during blasting, painting, and during all inspections.
B. Encase portable lamps in a non-conductive, shatterproof material. Use only heavily insulated cable with an abrasive resistant casing.

C. Install all temporary electrical items in accordance with all local, state, and federal codes, including OSHA.
D. Protect from paint overspray and damage from abrasive materials.
E. Measure required illumination during surface preparation and coating application at the work surface. Supply 20 ft. candles minimum illumination during blasting and painting, and 30 ft. candles minimum prior to and during inspection, per SSPC-Guide 12. Inspect the prepared surface at the higher illumination prior to calling for inspection. All work must conform to specification requirements prior to the scheduled inspection.
F. Measure the illumination at the work surface in the plane of the work.

PART 4 – SPECIAL PROVISIONS

4.01 WELD PREPARATION PRIOR to COATING

A. Prepare all new welds per NACE RPO 0178 prior to coating application. Grind welds to category D.

4.02 LEAKING INLET & OUTLET VALVES

A. It is not known whether isolation valves in tank's inlet and outlet piping are capable of completely sealing off the tank from the distribution system. Even with the valves closed, it is possible that a small flow of water may enter the tanks from the distribution system.
B. The contractor is responsible for stopping this flow of water and/or discharging it from the tank to allow the tank's wet-interior to be painted per the Contract Documents.

4.03 SCHEDULING

A. Complete all welding and any other work that damages the coating before paint operations begin, including surface preparation. The exception is paint removal in the weld area.
B. If contractor wants a variance in this schedule, request the change and give reason in writing to the project manager. The project manager will reply with a written Field Order if change is approved. Engineer reserves the right to put further restrictions in Field Order. If contractor objects to restrictions, he may revert to the original specifications.

4.04 GRASS RESTORATION

A. The contractor is to report any damaged ground at the construction site in writing prior to mobilization of equipment, otherwise all repairs to the damaged ground will be the responsibility of the contractor.

B. Refill all holes, ruts etc and level area around the construction site to the original grade.
C. Fill material to be clean soil, no gravel, rocks or construction debris is to be used as fill material without the owners consent.
D. Bring soil to a friable condition by disking, harrowing, or otherwise loosening and mixing to a depth of 3 in. – 4 in. Thoroughly break all lumps and clods.
E. Rake area to be seeded. Sow seed at a minimum rate of 220 lbs/acre. Use seed intended for the climate.
F. Work to be completed to the owner's satisfaction.
G. Cost is incidental to exterior painting.

SECTION 09 97 13.10

STEEL COATING SURFACE PREPARATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Full Field Abrasive Blasting.

1.02 REFERENCES

A. AWWA Standards:
   1. D102-11 Painting Steel Water Storage Tanks.

B. SSPC and NACE Standards:
   1. SP6/NACE No. 3 – Commercial Abrasive Blast.
   2. SP10/NACE No. 2 – Near White Metal Abrasive Blast.
   3. VIS 1 (Visual standard for abrasive blasted metal).

1.03 WORK INCLUDED – SURFACE PREPARATION

A. Exterior: Abrasive blast clean to a SSPC-SP6 commercial standard. The contractor has the option to dry blast with a shrouded containment or use a robotic self contained blast unit, all areas not reachable with the self contained unit will be water dampen abrasive blast cleaned.

B. Wet Interior: Abrasive blast clean to a SSPC-SP10 near-white standard.

C. Lead/Chrome Paint: For additional requirements see Section 09 97 13.12 Lead/Chrome Disposal.

D. Containment: For additional requirements see Section 09 97 13.11.01.

1.04 WASTE SAMPLING

A. Sample waste from each portion of the project and keep waste segregated. Send to a NLLAP certified lab and test for TCLP for 8 metals.

B. The owner reserves the right to collect samples and to send them to their selected lab. This will be determined at the preconstruction meeting.

C. Pay all lab fees for 8 metals TCLP analysis on waste samples, total lead, and chrome on soil samples, and any subsequent testing if clean-up is warranted.

PART 2 – PRODUCTS

2.01 DEGREASER/CLEANER

A. Extra Muscle PrePaint Cleaner #705 as manufactured by Great Lakes Laboratories, Livonia, MI 1-800-888-1105.

2.02 EXTERIOR TANK CLEANER

A. United 727 Weather-Zyme as manufactured by United Laboratories, 320 37th Ave., St. Charles, IL 60174 1-800-323-2594.

2.03 FLASH RUST INHIBITOR

A. Hold-Tight 102 as manufactured by Hold-Tight Solutions, Inc., P.O. Box 77066, Houston, TX 77215 1-800-319-8802.

2.04 ABRASIVE – COAL SLAG – EXTERIOR

A. The coal slag shall be 20-40 grade, or 30-60 grade.
B. The abrasive shall be free of moisture, water soluble contaminants, dust, and oil.
C. The abrasive shall be stored and covered to prevent moisture contamination.
D. All leaking or spilling bags shall be removed, and affected areas properly cleaned.
E. All slag abrasive shall meet the requirements of SSPC-AB1 “Mineral and Slag Abrasive” June 1, 1991-Grade 3.
F. The use of silica sand, flint sand, and glass beads is prohibited.
G. All abrasive and grit material used, and all equipment supplied shall be subject to approval of the engineer. The abrasive or grit shall be sharp enough and hard enough to remove the mill scale, rust, and paint.

2.05 RECYCLABLE STEEL GRIT – ALTERNATE

A. Use recyclable steel grit size G-25 or G-50.
B. The abrasive is to be free of moisture, water soluble contaminants, dust, and oil.
C. The abrasive is to be stored and covered to prevent moisture contamination.
D. All leaking or spilling containers are to be removed, and affected areas properly cleaned.
E. All recyclable steel grit shall meet requirements of SSPC-AB1 “Metallic Abrasive” June 1, 1991.
F. All abrasive and grit material used, and all equipment supplied shall be subject to approval of the engineer. The abrasive or grit shall be sharp enough and hard enough to remove the mill scale, rust, and paint.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION – WET INTERIOR

A. Low pressure water clean at 4,000 psi all surfaces and appurtenances to remove sediment, minerals, soot, and other contaminants.
B. Staining may remain in place prior to abrasive blast cleaning, engineer to approve cleanliness.

3.02 PRE-SURFACE PREPARATION – EXTERIOR

A. Low pressure water clean at 4,000 psi all surfaces and appurtenances to remove mildew, soot, and other contaminants.
B. Use a biodegradable algicide for the exterior approved by the engineer.
C. Hand wash with a higher concentration of algicide any mildew not removed by power washing.
D. Mix algicide at level recommended by the manufacturer, but not at a level that could result in an environmental problem.
E. Hold water jet nozzle using a 0º or 15º tip perpendicular (90º to surface) at all times. Maintain a water jet nozzle distance of 2 in. – 10 in. from the surface.

3.03 GREASE REMOVAL – WET INTERIOR

A. Scrape all excessive grease and remove.
B. Power wash the remaining grease with 4,000 psi pressure washer using preheated water and a degreaser.
C. Degree of cleanliness will be checked with an ultraviolet light until grease has been totally removed.
D. No abrasive blast cleaning or painting will be permitted until all grease has been removed and all surfaces inspected by ultraviolet light.

3.04 NEAR WHITE METAL (SSPC-SP10) DRY BLAST – WET INTERIOR

A. Abrasive blast clean all surfaces and appurtenances to a near white metal finish (SSPC-SP10), latest edition thereof.
B. Maintain a profile of 2.0 – 3.0 mils on abrasive blast cleaned surfaces.
C. All interior abrasive blast cleaning is to be completed and all spent abrasive removed, and surfaces thoroughly cleaned prior to any primer application.
D. Once an area is acceptable for painting, apply all coats and allow coating to cure to touch prior to resumption of blasting or blast the entire tank before painting, use dehumidification to hold the blast. It is the contractor's discretion and responsibility to determine if the entire tank is to be blasted, or what size is to be blasted and coated (all coats).
E. The contractor is responsible for supplying heat and dehumidification to maintain blast conditions.

3.05 COMMERCIAL BLAST (SSPC-SP6) – EXTERIOR

A. Abrasive blast clean all surfaces and appurtenances to a commercial finish (SSPC-SP6), latest edition thereof.
B. Maintain a profile of 1.0 – 2.0 mils on abrasive blast cleaned surfaces.

3.06 WATER DAMPENED BLAST (SSPC-SP6) - EXTERIOR

A. Abrasive blast clean all surfaces inaccessible to a robotic vacuum blasting unit and appurtenances to a commercial finish (SSPC-SP6), latest edition thereof.
B. Inject water into the blasting media at the nozzle.
C. The engineer may require adjustment of the waterflow (increase or decrease) based on the amount of dust generated. Adjust nozzle pressure to reduce ricochet of abrasive. Supply sufficient water to suppress all dust.
D. Contain all water introduced into the tank, as well as the abrasive. The contractor is advised to use airflow and evaporation to his advantage to reduce the amount of water requiring removal.
E. Maintain a profile of 1.0 – 2.0 mils.
F. Furnish and use an approved rust inhibitor injected into the water. Proper mixing and application will be in the manufacturer's recommendations.
G. Rinse all residue, abrasive, etc. from the tank each day upon completion.

3.07 ROBOTIC VACUUM BLAST CLEANING - EXTERIOR

A. Abrasive blast clean all flat, accessible surfaces with a robotic vacuum blast unit.
B. Blast unit to be completely sealed to the surface with a mask and vacuum assembly. No external dust escape is permitted.
C. Seal must be maintained between the blast unit and surface.
D. Surfaces not accessible to the blast unit are to be water dampened abrasive blast cleaned using ground tarps to collect all paint chips and spent abrasive. Approved rust inhibitor to be added during water dampened blasting to resist flash rusting.
E. Surface preparation and profile to be maintained per these specifications. Engineering controls are to be used to maintain minimal standards.

3.08 HAZARDOUS WASTE DISPOSAL

A. Contract directly with a licensed hazardous waste hauler who is properly licensed in the State of Wisconsin to haul hazardous material.
B. Transport the debris for treatment to a licensed hazardous waste disposal site.
C. The contractor will not be paid any retainage until paperwork has been submitted, including submittal of the hazardous waste manifest. Any original of the hazardous waste manifest shall be returned to the owner.

D. Remove all hazardous waste from the site within thirty (30) days of completion of the blasting portion of the project.
E. Payment for disposal of hazardous waste is incidental to the project.

3.09 WASTE DISPOSAL – NON-HAZARDOUS

A. If after testing of the spent abrasive material the TCLP tests indicate the abrasive is not a hazardous waste, dispose the abrasive in a waste disposal facility.
B. All waste shall be handled by a licensed hauler. Supply the owner with all proper documentation of the final disposal site. The actual bill of lading and all manifests will be required prior to any payment.
C. Payment for non-hazardous waste disposal is incidental to interior or exterior painting.

3.10 WASTE DOCUMENTATION

A. Supply proper documentation of storage, transportation, and treatment, or disposal of the waste to the owner. The owner will retain sufficient funds to pay for hazardous waste transportation, treatment, and any possible fines until all documentation has been received. This retainage will be held, even if the waste has tested non-hazardous.

3.11 TESTING and CLEAN-UP of WASTE

A. Daily collect all spent abrasive from the ground tarps and dispose in the required receptacles. Prior to receiving test results, spent abrasive shall be stored on ground tarps. The spent abrasive is to be covered and weighted down so no dust can be released.
B. Furnish containers with proper labels for storage of the spent debris. Containers shall meet requirements of the EPA (or their local counterpart) for hazardous waste disposal. The spent abrasive will be moved directly from the tank into the waste containers. The containers will remain until final test results have been received. Furnishing containers with covers will be incidental to respective repaint, and will not be affected by the owner's final selection of respective interior or exterior disposal.
C. Waste to remain on-site in covered receptacles until waste test results are received.

SECTION 09 97 13.11.01

CONTAINMENT PROJECT – FLEXIBLE FRAME SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Flexible Frame Containment System Requirements.

1.02 REFERENCES

A. SSPC Guides:
   1. Guide 6 – Containing Debris Generated During Paint Removal Operations.

1.03 SUBMITTALS

A. Containment Plan.

1.04 ENVIRONMENTAL SAMPLING for EXTERIOR CONTAINMENT

A. Collect four (4) pre-project soil samples, compile a map, and collect four (4) post-project soil samples. Send samples to a NLLAP certified lab and test for total lead and chrome.
B. Sample waste from each portion of the project, and keep waste segregated. Send to a NLLAP certified lab and test for TCLP 8 metals.
C. The owner reserves the right to collect samples and to send them to their selected lab. This will be determined at the preconstruction meeting.
D. Pay all lab fees for 8 metals TCLP analysis on waste samples, total lead and chrome on soil samples, and any subsequent testing fees if clean-up is warranted.
E. Complete all sampling in accordance with EPA protocol.

1.05 PAYMENT

A. Payment for Section 09 97 13.11.01 Containment is incidental to exterior painting unless otherwise stated in these specifications.

PART 2 – PRODUCTS

2.01 DUST COLLECTORS – AIR FILTRATION UNITS

A. Furnish and use a dust collector during all blasting work.
B. Units to be equal in filtration capacity to Eagle Industries dust collectors. Other units may be used, but their substitution will be evaluated on efficiency at 0.5 micron size and airflow movement.
C. Use 60,000 cfm minimum for exterior blast work with containment.
D. Substitution of steel grit blasting may decrease the requirements of above. New requirements will be defined by the engineer based on the efficiency of the contractor's equipment.
E. Furnish HEPA filters for dust collection.
F. Number of dust collectors shall be sufficient to supply a 50 ft./minute downward draft at most areas. An average may be considered. Determination of actual containment plan will be the deciding factor. Calculations of airflow shall be included in the containment submittal.
G. Use only new filters or filters certified clean.

2.02 GROUND TARPS

A. Use impermeable ground tarps, 20 mils thick.
B. Use ground tarps able to withstand the anticipated construction traffic without tearing or separating.

2.03 CONTAINMENT SHROUDS

A. All shroud material and superstructure shall be non-penetrating, nylon rip-stop material manufactured by Eagle Industries, or approved equal. Approval of alternate material will be based on density, weight, support strength, stitching, reinforcement, home office experience, and staff assistance.

2.04 CONTAINMENT CONNECTIONS to TANK

A. Steel plating and other Structural Shapes – ASTM A36.
B. Bolts – ASTM A307.
C. Welds – E70XX Electrodes.

PART 3 – EXECUTION

3.01 DUST CONTAINMENT – EXTERIOR

A. Do everything within industry standards to minimize dust as a nuisance. Required procedures include: angle of abrasive impact, direction of nozzle spray, orifice pressure, and work stoppage due to wind speed or direction.
B. Complete any additional measures required in these specifications. There will be no negotiations for extra compensation for nuisance complaints and corrective measures.
C. Fully inspect the area, land use, and other pertinent local conditions prior to bidding exterior work.
D. Do not permit dust, abrasive, or paint chips to fall outside the containment system perimeter or ground cover.
E. Do not permit any visual dust release when transferring abrasive from either the interior or exterior of the structure to the dumpsters. Suppress dust with tarps or water, or other preapproved method.

3.02 CONTAINMENT during ABRASIVE BLAST CLEANING – EXTERIOR – SSPC-GUIDE 6 – CLASS 1A

A. Furnish and install a total containment system to be used during all dust generating work.
B. This specification is intended to be performance based. Alternative procedures to accomplish the same purpose of dust or lead elimination may be submitted for review. The final determination if the alternate performs as well as total containment will rest solely with the engineer. Printed material and test results by independent firms will be considered, but not govern. Rejection of an alternative after bid opening will not relieve the contractor of any responsibility to complete the work as bid, unless his bid states that his bid is to be withdrawn if the alternate is rejected. Submit a sketch of the alternate containment procedures with bid.
C. Contain waste abrasive and paint chips to the area immediately under the structure. No release outside the containment system will be permitted. The shrouds will be erected on all sides of the tank for 360º.
D. Cover the roof with containment shrouds. Separate vertical tarps from the roof or sidewalls to allow waste from the roof to slip down the inside of the shields.
E. Support the containment shields by temporary braces attached to the roof and ground. Leave space to allow rigging and equipment to be used within the shields. Extend the bracing out from the structure, and secure cables to the ground by use of deadmen. Design system, bracing, deadmen, shields, etc. depending on the size of the structure, availability of space, prevailing wind forces, and local restrictions.

F. Immediately replace/repair any damaged shrouds. Discontinue blast operations until the damaged shrouds are repaired or replaced.
G. Use air impenetrable walls and roof with either rigid or flexible framing.
H. Overlap all seams by 2 ft. Completely seal all seams by stitching, taping, caulking, or other sealing measures.
I. Any holes cut in steel platforms or the tank are to be rewelded, top and bottom, with 3/16 in. full fillet welds. Use reinforcements as required.
J. Cost for structural reinforcement of the roof and/or any other part of the tank, to support the containment system, is incidental to exterior painting.

3.03 TANK CONNECTIONS

A. In submittal, request approval of all welding and cutting on the tank.
B. Cut all approved holes into the tank with rounded corners.
C. Use a welder certified to complete the type and position weld necessary for attachment.
D. All steel must be cleaned of lead paint by approved method before cutting or welding.

3.04 CONTAINMENT OPENINGS

A. Design a means of ingress and egress of the containment structure. Access shall be through an overlapped door on each side of the chamber.
B. Size of the structure shall be 8 ft. x 8 ft. x 6 ft. high. Fabricate the structure from scaffolding and cover with overlapping tarps secured in-place. Construct the chamber out of 6 ft. high scaffold sections. Install the scaffold so the majority of the scaffold is extended out from the containment. Minimum clear walking height shall be 54 in. Minimum width shall be 42 in.
C. Fabricate the opening for exhaust air piping with a minimum 18 in. long tunnel firmly attached. Maintain the exhaust piping in as straight a line as possible to avoid restricting airflow. Exhaust air attachments may be elsewhere other than the entryway.
D. Supply an operating HEPA vacuum in the entryway to vacuum off workers leaving the containment. Maintain the vacuum clean and serviced.

3.05 GROUND COVER

A. Protect the ground from contamination. Include the area inside the containment, and a 10 ft. diameter around the outside of the containment.
B. Lap all ground tarps a minimum of 2 ft. Lap the inside ground tarps up 2 ft. on the outside of the vertical shrouds. Lap the outside ground tarps 2 ft. under the inside tarps with slots for cables. This will prevent loss of abrasive material between the ground and vertical shrouds.

3.06 DAILY SHUTDOWN

A. Clean all ground tarps daily. Collect all debris and store in barrels. Roll all tarps for storage, including all tarps inside containment. The purpose is to prevent the debris from being blown off the tarps.

B. After blasting, clean all flat surfaces daily before the containment structure is lowered. Also clean all rigging and equipment before lowering containment, or removing the roof cover.

SECTION 09 97 13.12

LEAD/CHROME BASED PAINT REMOVAL and DISPOSAL

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Lead/Chrome Paint Removal and Disposal.

1.02 REFERENCES

A. SSPC Guide-7 Disposal of Lead Contaminated Surface Preparation Debris.

1.03 PAINTER QUALIFICATIONS – LEAD PROJECTS

A. Contractor shall complete all coating and surface preparation.
B. Painter shall be specialized in industrial or heavy commercial painting, and experienced in removing lead based coatings.
C. ALL CONTRACTORS SHALL BE PREQUALIFIED, or have successfully completed the SSPC QP2 Contractor Prequalification Program for lead removal projects.
D. Submit five (5) successful paint projects of similar nature with the bid proposal if the engineer is not familiar with the contractor's work.

1.04 SUBMITTALS

A. Lead, Health & Safety Plan (LH&SP).
B. Site Specific LH&SP including:
    1. Work procedures for each job classification.
    2. Administration and engineering controls to be used during exposure assessment period and expected exposure.
    3. Personal hygiene procedure.
    4. Site personnel register (updated as needed).
    5. Qualifications of competent persons and responsibilities. At this point, multiple qualified people may be submitted.
    6. 24 hour job site contact person.
    7. Site map showing ingress/egress and locate all equipment.

PART 2 – PRODUCTS

2.01 LEAD REMOVAL PRETREATMENTS – WET INTERIOR

A. PreTox 2000 FD, 4050 Westmark Drive, Dubuque, Iowa 52002, 1-800-338-8296.
B. EnviroPrep Premium 33010 as manufactured by Hoffer's Coatings, Inc., Wausau, WI, 1-800-338-8296.

2.02 RECYCLABLE STEEL GRIT – ALTERNATE

A. Use recyclable steel grit size G-25 or G-50.
B. The abrasive is to be free of moisture, water soluble contaminants, dust, and oil.
C. The abrasive is to be stored and covered to prevent moisture contamination.
D. All leaking or spilling containers are to be removed, and affected areas properly cleaned.
E. All recyclable steel grit shall meet requirements of SSPC-AB1 Metallic Abrasive June 1, 1991.

2.03 DECONTAMINATION FACILITY

A. Provide a climatic controlled decontamination facility. The decontamination facility must include a minimum of three separate areas: a dirty area, a showering area, and a clean area. The unit shall be as manufactured by Eagle Industries of Louisiana, Inc.
B. Entry and exit into the showering room must be through an approved airlock designed to prevent cross-contamination between any two areas.
C. Equip the clean room with adequately sized lockers for each worker to secure and store clothing, valuables, and other personal belongings.
D. Equip the decon facility with an onboard ion exchange lead filtration system capable of filtering all wastewater generated during hand washing operations, showering, laundering of towels and clothing, or from any other water used in cleaning.
E. Recordkeeping log signed by each employee upon exiting that time was provided and decon procedures were followed.

PART 3 – EXECUTION

3.01 CLOTHING – CONTRACTOR

A. Provide protective clothing for all personnel – disposal or laundered is acceptable.

3.02 NOTIFICATION of NEIGHBORS

A. Enclose the entire project site, including the clean area, inside a yellow ribbon bearing the warning label of lead.
B. Post signs around the project stating "**CAUTION – LEAD HAZARD – DO NOT ENTER**"
C. If the neighbors are in close proximity, the contractor shall participate in any education notification program originated by the owner.

3.03 PERSONAL HYGIENE – LEAD PROJECTS

A. Register all personnel on the site and try to maintain, as much as possible, the same crew.
B. Any changes in crew size or personnel will require registration. Registration simply means notification to the owner or engineer of a new person on the job site.
C. Inform all personnel of the dangers involved with lead from a health standpoint, and require use of washroom/decon facilities.
D. Ensure proper use and compliance of personnel with health department and OSHA requirements.
E. Complete contractor certification form that all employees complied with OSHA 1926.62 hygiene rules, and contractor, as employer, complied with their required OSHA housekeeping and compliance requirements.

SECTION 09 97 13.13.02

WET INTERIOR STEEL COATING – THREE COAT ZINC EPOXY

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Painting in the wet interior.

1.02 REFERENCES

A. SSPC and NACE Standards:
   1. PA1 – Paint Application.
   2. PA2 – Measurements and Calibration.
   3. NACE RP 0178 Surface Finish Requirements.

1.03 WORK INCLUDED

A. Application of a three (3) coat zinc epoxy system.

PART 2 – PRODUCTS

2.01 ZINC EPOXY POLYAMIDE – 3 COAT SYSTEM – WET INTERIOR

A. Three (3) coat zinc epoxy polyamide system meeting all National Sanitation Foundation certification standards for potable water contact.

B. Approved suppliers and system:

Manufacturer	System
Tnemec	94H_2O/20/20 (stripe)/20
Induron	Indurazinc MC-67/PE-70/PE-70(stripe)/PE-70
Sherwin Williams	Corothane I/646PW/646PW(stripe)/646PW

PART 3 – EXECUTION

3.01 ZINC EPOXY POLYAMIDE – 3 COAT SYSTEM – WET INTERIOR

A. Apply a three (3) coat zinc epoxy paint system to all prepared surfaces.

B. Abrasive blast cleaning and paint requirements have been previously defined in Section 09 97 13.10.

C. Apply each coat at the following rates:

Coat	Minimum D.F.T.	Maximum D.F.T.
Primer	2.5	3.5
Intermediate	3.5	4.5
Stripe Coat	1.5	2.5
Topcoat	3.5	4.5
Total	9.5*	12.5*

*Total does not include stripe coat.

D. Stripe coat to be applied to all welds, angles, and sharp edges throughout the structure, including above the high water line and all roof beams, etc.

E. Each full coat to be a different color from the previous coat and is to be approved by the engineer. No color bleedthrough should occur if proper application rates are observed.

F. Apply all coats in uniform color and sheen without streaks, laps, runs, sags, cloudy, or missed areas. Correct all defects before application of the successive coat.

G. Allow a minimum of twenty-four (24) hours between coats (including stripe coat). Additional time may be necessary if low temperatures require an increase in the necessary cure time.

H. MAINTAIN FORCED VENTILATION A MINIMUM OF SEVEN (7) DAYS AFTER TOPCOAT APPLICATION, time required for cure is dependent on the coating manufacturer and temperature. Record variations of the standard procedures (roof hatch closure because of rain, etc.), and submit to the engineer. Heat is required if, in the opinion of the engineer, the integrity of the coating is endangered by cold weather, or if additional cure time will delay the project beyond the substantial completion date.

3.02 SCHEDULE of WORK

A. Complete all exterior and interior welding prior to surface preparation.

SECTION 09 97 13.13.09

WET INTERIOR STEEL COATING – TWO COAT ZINC 100% SOLIDS EPOXY - ALTERNATE

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Painting in the wet interior.

1.02 REFERENCES

A. SSPC and NACE Standards
   1. PA1 – Paint Application.
   2. PA2 – Measurements and Calibration.
   3. NACE RP 0178 Surface Finish Requirements.

1.03 WORK INCLUDED

A. Application of a two (2) coat zinc 100% solids epoxy system.

PART 2 – PRODUCTS

2.01 ZINC EPOXY POLYAMIDE – 2 COAT SYSTEM – WET INTERIOR

A. Two (2) coat zinc epoxy polyamide system meeting all National Sanitation Foundation certification standards for potable water contact.

B. Approved suppliers and systems:

Manufacturer	System
Tnemec	94H_2O/FC22
Induron	Indurazinc MC-67/Permaclean 100
Sherwin Williams	Corothane I/Sherplate PW

PART 3 – EXECUTION

3.01 ZINC EPOXY POLYAMIDE – 2 COAT SYSTEM – WET INTERIOR

A. Apply a two (2) coat one hundred percent solids epoxy paint system with a zinc primer to all prepared surfaces and appurtenances.

B. Abrasive blast cleaning and paint requirements have been previously defined in Section 09 97 13.10

C. Apply each coat at the following rates:

Coat	Minimum	Maximum
Primer	2.5	3.5
Topcoat	30.0	40.0
Total	32.5	43.5

D. Supply each coat in the color specified, or in color approved by the engineer. No color bleed-through should occur if proper application rates are observed.

E. Apply all coats in uniform color and sheen without streaks, laps, runs, sags, cloudy, or missed areas. Correct all defects before application of the successive coat.

F. Because of the unique properties of one hundred percent epoxy coatings, the following environmental restrictions, application procedures, and storage procedures shall be included to clarify the special requirements necessary for a successful painting project.

1. In no instance shall the coating be applied at surface temperatures below 35°F (for primer and topcoat), unless a written request has been supplied to the engineer. Epoxy coating to be stored at a minimum of 70°F for 48 hours before paint application begins.
3. Appropriate spray equipment for proper execution of the work shall be used by the contractor.
4. Manufacturer's representative shall be on site and certify that all equipment and materials on site conform with application requirements. Representative shall verify proper mixing and application of 100% solids epoxy.

3.02 SCHEDULE of WORK

A. Complete all exterior and interior welding prior to surface preparation.

SECTION 09 97 13.23.02

EXTERIOR STEEL COATING – FOUR COAT ZINC EPOXY URETHANE

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Painting on the exterior.

1.02 REFERENCES

A. SSPC and NACE Standards:
   1. PA1 – Paint Application.
   2. PA2 – Measurements and Calibration.
   3. NACE RP 0178 Surface Finish Requirements.

1.03 WORK INCLUDED

A. Application of a four (4) coat zinc epoxy urethane system.

PART 2 – PRODUCTS

2.01 ZINC EPOXY URETHANE – 4 COAT SYSTEM – EXTERIOR

A. The coating shall be an epoxy urethane system.
B. The contractor is advised to follow all rules for safety while using isocyanates.
C. Ultraviolet protection additives mixed at factory only. There will be no tinting or addition of any material other than the manufacturer's thinners.
D. Approved suppliers and systems:

Manufacturer	System
Tnemec	90-97/66/1074/1074UV
Induron	Indurazinc MC-67/PE-70/I-6600/I-6600
Sherwin Williams	Corothane I/646PW/Acrolon Ultra/Acrolon Ultra

PART 3 – EXECUTION

3.01 ZINC EPOXY URETHANE – 4 COAT SYSTEM – EXTERIOR

A. Apply to all prepared surfaces and appurtenances a four (4) coat zinc epoxy urethane system.

B. Surface preparation and paint requirements have been previously defined. Apply all coating by brush and roller. Spray application is prohibited.

C.

Coat	Minimum D.F.T.	Maximum D.F.T.
Primer	2.5	3.5
Epoxy Intermediate	2.0	3.0
Urethane Intermediate	2.0	3.0
Topcoat	2.0	3.0
Total	8.5	12.5

D. Each full coat to be a different color from the previous coat and is to be approved by the engineer. No color bleedthrough should occur if proper application rates are observed.

E. Apply all coats in uniform color and sheen without streaks, laps, runs, sags, cloudy, or missed areas. Correct all defects before application of the successive coat.

F. Allow a minimum of twenty-four (24) hours between coats. Additional time may be necessary if low temperatures require an increase in the necessary cure time.

G. The contractor is advised that Dixon Engineering, Inc. will take dry film thickness readings on the exterior per SSPC-PA2 which requires gauge adjustment from magnetic plane to peak plane.

3.02 SCHEDULE of WORK

A. Complete all exterior and interior welding prior to surface preparation.

SECTION 09 97 23.23.01

CONCRETE FOUNDATION COATING – TWO COAT EPOXY

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Painting of the concrete foundation(s).

1.02 REFERENCES

A. SSPC and NACE Standards:

1. PA1 – Paint Application.
2. PA2 – Measurements and Calibration.

1.03 WORK INCLUDED

A. Application of a two (2) coat epoxy system.

PART 2 – PRODUCTS

2.01 EPOXY POLYAMIDE – 2 COAT SYSTEM – FOUNDATION

A. Two (2) coat epoxy polyamide system.

B. Approved suppliers and manufacturers:

Manufacturer	System
Tnemec	66/66
Induron	PE-70/PE-70
PPG	Amerlock 2/Amerlock 2
Sherwin Williams	646PW/646PW

PART 3 – EXECUTION

3.01 EPOXY POLYAMIDE – 2 COAT EPOXY – FOUNDATION

A. Apply to all prepared areas a two (2) coat epoxy system.

B. Foundations to be water cleaned. Remove dirt 3" below grade around the entire foundation prior to coating, backfill once topcoat is dry to the touch.

C. Apply each coat at the following rates:

Coat	Minimum D.F.T.	Maximum D.F.T.
Primer	3.5	5.5
Topcoat	3.5	5.5
Total	7.0	10.0

D. Allow the manufacturer's minimum time between coatings.

E. Cost is incidental to exterior painting.

APPENDIX A

PARTIAL INSPECTION REPORT

Dixon Engineering, Inc.

Preliminary Maintenance Inspection

6,000,000 Gallon Ground Storage Tanks (East and West)

Milwaukee Water Works
Milwaukee, Wisconsin

Dixon Engineering, Inc.
9415 W. Forest Home #208
Hales Corners, WI 53130
Phone: (414) 529-1859
Fax (414) 529-3120
http://www.dixonengineering.net
Wisconsin@dixonengineering.net

Inspection Performed: September 30, 2014
Report Prepared: December 5, 2014

This report contains the conclusions and recommendations for the East and the West tanks. Except where noted each tank has the same recommendations and conclusions.

CONCLUSIONS:

1. The exterior coating on each tank is presumed to be an alkyd system that is in poor condition. Extensive rust bleedthrough is present on each tank. The coating is not protecting the metal.

2. The wet interior coating on the east tank is a lead based primer with a grease coating above the water line and a coal tar epoxy coating on the floor and sidewalls. The coating on the west tank is a lead based primer with grease above the high water line and an epoxy coating system on the floor and sidewalls. The grease coatings are in fair condition, the epoxy coatings are in poor condition.

3. Exterior and wet interior coating samples were taken and analyzed for metal content. Test results indicated the exterior is not a heavy metal bearing coating; the wet interior primer under the grease is a heavy metal coating.

INSPECTION:

On September 30, 2014, Dixon Engineering, Inc. (DIXON) performed a float inspection on the two 6,000,000 gallon reservoirs owned by the Milwaukee Water Works. Purposes of the inspection were to evaluate the interior and exterior coating's performance and life expectancy; assess the condition of metal surfaces and appurtenances; review safety and health aspects; and make budgetary recommendations for continued maintenance of the tank. All recommendations, with budgeting estimates for repairs are incorporated in this report. The inspection was performed by Tom Van Gemert, Senior Engineer. The inspector was assisted by Jim Orr, project manager. The inspection was performed while each tank was full of water from an inflatable raft.

TANK INFORMATION:

The tanks were built in 1955 with a height-to-high water line of 36 feet, the tanks are welded construction.

CONDITIONS AND RECOMMENDATIONS:

EXTERIOR COATING CONDITIONS:

The exterior coating system is a multiple coat alkyd coating system that is in poor condition.

The sidewall and roof coating is in poor condition. Primary methods of coating deterioration is rust bleed-through. There are extensive coating breaks with large amounts of surface rust and rust staining.

This exterior system was tested at a maximum of 0.044 percent (44 ppm) lead by weight. This level of lead is a trace amount and should not trigger require special provisions for waste disposal.

EXTERIOR COATING RECOMMENDATIONS:

Remove the existing coating by dry abrasive blast cleaning the metal to a commercial grade (SSPC-SP 6) and apply a polyurethane system. Total removal is recommended because the primer no longer has proper adhesion and will not support additional coats of paint. All blasting work would be performed inside a dust tight flexible containment system using negative air pressure or using a vacuum type dust containing robotic blast cleaning system.

The coating system would consist of a full prime coat on the bare metal, a full coat of epoxy, followed by a two full coats of polyurethane. The polyurethane system offers excellent abrasion resistance with high gloss and sheen retention. The expected life of this system is fifteen years. The system can be recoated again in fifteen years, and a second time approximately fifteen years after the first recoating, extending the life of the coating to forty-five years before total removal would be necessary again. The tank would be removed from service during the painting project. This is necessary to reduce moisture condensation on the tank's surface. Polyurethane coatings have a minimum temperature requirement for application and are sensitive to moisture during the curing process. If moisture is present during the curing process, the appearance will become cloudy with little or no gloss.

WET INTERIOR COATING CONDITIONS:

The wet interior roof of each tank is coated with a lead based primer and a grease topcoat. The east tank has coal tar covering the floor and sidewalls with a lead based primer. The west tank has a lead free epoxy coating on the floor and sidewalls.

This grease systems were tested at a maximum of 0.41 percent (4,100 ppm) lead by weight.

The roof coating in each tank is in fair condition. The coating is 95 percent intact, with a few areas where the grease has deteriorated and allowed spot corrosion to form. No significant metal corrosion was found on the roof sheets or roof supporting structure of either tank.

The sidewall coating of the east tank is coal tar epoxy with a lead based primer. It is in poor condition. The coating on the sidewalls is 95 percent intact. There is not any significant damage at the high water line, which would be the area most affected by ice pressures and ice movement. Causes of deterioration is spot coating breaks from age.

The sidewall coating of the west tank is a lead free epoxy system. It is in poor condition. The coating on the sidewalls is 95 percent intact. There is not any significant damage at the high water line. Causes of deterioration is spot coating breaks from age.

WET INTERIOR COATING RECOMMENDATIONS:

Since the existing coating is a heavy metal based coating, during abrasive blast cleaning procedures the waste generated may be considered hazardous waste and groundwater leachable. In addition, the airborne particulate of spent abrasive and lead paint may be considered a threat to public health, not only to workers, but also to pedestrians, residences, and business owners in the immediate vicinity. Special requirements for worker respiratory safety, environmental protection and waste disposal will need to be incorporated into the project specifications.

Remove the grease by solvent cleaning then remove the coating system by abrasive blast cleaning the metal to a near white metal grade (SSPC-SP 10) and apply a new zinc epoxy coating system. Paint systems are to be approved for potable storage tanks contingent upon meeting requirements of National Sanitation Foundation Standard 60/61.

Epoxy paint systems are recommended in most applications. Their drawbacks are a minimum application temperature of 50°F or 35°F for fast cure; and long cure times, 7 days at 70°F and up to 28 days at 35°F. The coatings are formulated in high solids form to reduce VOC emissions and have good adhesion and abrasion resistant qualities. The coatings are normally applied in three coats with recoat times up to twenty-four hours.

CATHODIC PROTECTION CONDITIONS:

The tank does not contain a functioning cathodic protection system.

The tank does not have clips and a pressure fitting installed for a future cathodic protection installation. The clips are located on the lower sidewall.

CATHODIC PROTECTION RECOMMENDATIONS:

Install cathodic clips and couplings for future installation of floating-type impressed current cathodic protection system.

SITE CONDITIONS:

The size of the tank site is large and is fenced with a locking gate.

There is a large sized staging area for the contractor's equipment.

The site is well maintained.

There is industrial development/open fields to the east, west, and south. It is adjacent to residential development to the north.

The neighbors are close to the tank and extra precautions will need to be taken to keep from getting paint or debris on the neighbors' properties.

The site is accessible from a municipal street and a paved drive.

Tree branches are rubbing on the sidewalls of the tank. The tree branches have worn away some of the coating.

There are small bushes encroaching on the foundation. Grass is encroaching on the foundation.

SITE RECOMMENDATIONS:

Regularly mow the grass and trim the trees near the tank. Cut the tree limbs back that are rubbing on the tank.

Remove growth and shrubs next to the footings to prevent encroachment on the foundations.

FOUNDATION CONDITIONS:

None of the foundation is exposed. Soil is covering all of the foundation on each tank.

FOUNDATION RECOMMENDATIONS:

Pressure wash the concrete and coat the exposed concrete to help prevent further deterioration with an epoxy coating system. The cost would be incidental to exterior painting.

Excavate to expose the top 6 inches of the foundation. Remove the soil piled up against the foundation.

CAULK CONDITIONS:

It is expected that the caulk is in poor condition between the foundation and the sidewall of each of the tanks.

CAULK RECOMMENDATIONS:

Repair the caulk at the foundation. Caulk keeps water from getting between the foundation and tank.

Remove all loose or deteriorated caulk then repair with new caulk.

ROOF HANDRAIL AND PAINTER'S RAIL:

The tank has no roof handrail or painter's rail.

ROOF HANDRAIL AND PAINTER'S RAIL RECOMMENDATIONS:

Install a step off platform and handrails at the edge of the roof to either side of the sidewall ladder. The railings will allow someone working near the edge of the roof to be tied off and secure behind the railing. The railing should be 42-inches high with a mid-rail and a 4-inch toe plate.

Install rigging couplings on the roof for fall prevention of workers in the wet interior. These would allow a contractor working in the wet interior to be completely tied off to a fall prevention device at all times.

OVERFLOW PIPE CONDITIONS:

Each tank has five, 8-inch diameter overflow pipes that extend along the sidewall to ground level.

The overflow pipe is also used for draining the roof gutter.

The inlet end of the overflow pipes are screened where the roof gutters drain into the overflow pipe. The screens are in good condition.

The pipes route through the ground to a nearby storm drain with no air gap.

A trough has formed next to the pipes in several locations, exposing the foundation. Vegetation is growing next to some other pipes.

HATCH AND MANWAY CONDITIONS:

The tanks each have a 22-inch x 48-inch sliding lid roof access hatch to the wet interior. The hatches are in poor condition.

The hatch covers does no seat properly and are difficult to open and close.

The cupola on each tank has a 24-inch x 30-inch hinged door for access to the center interior balcony.

Each tank has three 18-inch x 24-inch elliptical access manways in the sidewall that are in fair condition.

The manways are not hinged, the gaskets showed minimal signs of leaking. The crab bolts are moderately rusted.

HATCH AND MANWAY RECOMMENDATIONS:

Install a 30-inch manway in the sidewall, average rescue baskets will not pass through the existing manways. The estimated cost is $8,000 per tank.

Replace the wet interior roof access hatches with a new 30-inch curbed hatch.

VENT CONDITIONS:

The roof vent on each tank is a 28-foot diameter copula. The vents are in good condition.

VENT RECOMMENDATIONS:

Clean and coat the existing vent screens. The screens are expanded metal and are in good condition.

Annually inspect the vents to make sure the screens are open and not damaged.

LADDER CONDITIONS:

Exterior:

The tanks have an exterior sidewall ladder that starts approximately 10-feet above ground level, and extends up to the roof. The ladders are caged and in good condition. The ladders do not contain a fall prevention device. The ladders are undersized.

Wet:

There is no ladder in the wet interior.

LADDER RECOMMENDATIONS:

Exterior:

Replace the exterior ladders with OSHA compliant ladders that contain a fall prevention device.

WET INTERIOR METAL CONDITIONS:

The steel structure is in good condition above the high water line and in good condition below it.

Roof Beams:

The interior roof is supported by multiple outer and inner trusses. There are roof beams and purlins between the trusses.

The roof support structure is in good condition with minor corrosion in the crevices and at the edges.

The center balcony rests on a circular ring beam that is supported by columns.

Columns:

The ring beams that are supported by eight columns.

The columns are I-beams and are in good condition.

West

1. The sidewalls are heavily corroded and foundation is not visible.

2. The exterior roof coating is in poor condition with extensive rust bleed through.

3. Same.

West

4. The center copula is in good condition; the coating is in poor condition.

5. One of the vent panels on the copula is bent.

6. The roof hatch is in fair condition; the coating is in poor condition.

West

7. The roof hatch slides open; it is difficult to operate.

8. The gutter and drains at the edge of the roof are in good condition.

9. The gutter drains discharge into the overflow pipes.

West

10. The screens on the tops of the overflow pipes are in good condition.

11. The center roof support structure is in good condition. The areas above the water level are coated with a lead based primer and a grease topcoat.

12. Same.

West

13. The roof support structure is in good condition and is coated with grease.

14. The roof panels and roof beams are in good condition.

15. The sidewalls are coated with epoxy that is in poor condition.

West

16. The sidewall to roof junction is in good condition.

17. The epoxy coating above the water level is in poor condition.

18. Same.

West

19. The center balcony is in good condition.

20. The center columns are in good condition.

21. The roof structure is in good condition.

APPENDIX B

PAINT CHIP LEAD & CHROMIUM RESULTS

ANALYTICAL LABORATORY REPORT

CUSTOMER: Dixon Engineering - WI
9415 West Forrest Home Suite 208
Hales Corners, WI 53130

DATE RECEIVED: Wednesday, October 1, 2014
PO/PROJECT #:
SUBMITTAL #: 2014-10-01-017

LAB NUMBER: AB84836

Sampled By: Tom Van Gemert
Job Location: Milwaukee West 6MM GS
Sample Identification: 1- Exterior roof

Date Sampled: Tuesday, September 30, 2014
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Friday, October 3, 2014

ELEMENT	RESULT (by dry weight)	REPORTING LIMIT (RL)
Cadmium	< RL	0.00075 %
Chromium	0.020 %	0.0013 %
Lead	0.044 %	0.0025 %

LAB NUMBER: AB84837

Sampled By: Tom Van Gemert
Job Location: Milwaukee West 6MM GS
Sample Identification: 2- Exterior sidewall

Date Sampled: Tuesday, September 30, 2014
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Friday, October 3, 2014

ELEMENT	RESULT (by dry weight)	REPORTING LIMIT (RL)
Lead	0.014 %	0.0032 %

LAB NUMBER: AB84838

Sampled By: Tom Van Gemert
Job Location: Milwaukee West 6MM GS
Sample Identification: 3- Interior roof

Date Sampled: Tuesday, September 30, 2014
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Friday, October 3, 2014

ELEMENT	RESULT (by dry weight)	REPORTING LIMIT (RL)
Cadmium	< RL	0.00075 %
Chromium	0.010 %	0.0013 %
Lead	0.41 %	0.0025 %

ANALYTICAL LABORATORY REPORT

CUSTOMER: Dixon Engineering - WI
9415 West Forrest Home Suite 208
Hales Corners, WI 53130

DATE RECEIVED: Wednesday, October 1, 2014
PO/PROJECT #:
SUBMITTAL #: 2014-10-01-017

LAB NUMBER: AB84839

Sampled By: Tom Van Gemert
Job Location: Milwaukee West 6MM GS
Sample Identification: 4- Interior wall

Date Sampled: Tuesday, September 30, 2014
Sample Description: Paint Chips

Preparation Method: EPA 3050B-P-M (Acid Digestion for Paints)
Analysis Method: EPA 6010C (ICP-AES Method for Determination of Metals)
Date Analyzed: Friday, October 3, 2014

ELEMENT	RESULT (by dry weight)	REPORTING LIMIT (RL)
Lead	0.0062 %	0.0025 %

ANALYTICAL LABORATORY REPORT

CUSTOMER: Dixon Engineering - WI
9415 West Forrest Home Suite 208
Hales Corners, WI 53130

DATE RECEIVED: Wednesday, October 1, 2014
PO/PROJECT #:
SUBMITTAL #: 2014-10-01-017

Unless otherwise noted, the condition of each sample was acceptable upon receipt, all laboratory quality control requirements were met, and sample results have not been adjusted based on field blank or other analytical blank results. Individual sample results relate only to the sample as received by the laboratory.

Tests Reviewed By: Jason Kraai, Senior Analyst Jason Kraai 2014.10.07 16:53:36 -04'00'

CCC&L has obtained accreditation under the following programs:

- **National Lead Laboratory Accreditation Program (NLLAP)**
  ELLAP: AIHA-LAP Laboratory ELLAP Accreditation Program Laboratory, ID#101030 (www.aihaaccreditedlabs.org)
  OH: Ohio Department of Health Lead Poisoning Prevention Program, Approval #E10013 (www.odh.ohio.gov)
- **AIHA-LAP Laboratory IHLAP Accreditation Program** (www.aihaaccreditedlabs.org)
  IHLAP: Laboratory ID#101030
- **National Environmental Laboratory Accreditation Program (NELAP)**
  NY: State of New York Department of Health, Laboratory ID#11609 (Serial # 50712, 50714-50716, 51544) (518-485-5570)
  LA: State of Louisiana Department of Environmental Quality, Laboratory ID#180321 (Certificate 05036) (www.deq.louisiana.gov)
  OK: Oklahoma Department of Environmental Quality, Laboratory ID#9993 (Certificate 2014-025) (www.deq.state.ok.us)

Testing which is performed by CCC&L according to test methods, or for elements which are not included in the table below fall outside of the current scope of laboratory accreditation. Customers are encouraged to verify the current accreditation status with the individual accreditation programs by calling or visiting the appropriate website for the applicable program.

SCOPE OF ACCREDITATION

Air and Emissions

Element/Test	Method	Accreditation(s)
Suspended Particulates: PM10 / TSP	40 CFR 50 Appendix J / 40 CFR 50 Appendix B	NY, LA
Lead in Airborne Dust	NIOSH 7300	ELLAP, OH, NY, LA
Lead in Airborne Dust	EPA 600/R-93/200/ EPA 6010C	ELLAP, OH
Metals in Airborne Dust	EPA 600/R-93/200/ NIOSH 7300/ EPA 6010C	IHLAP
Surface Coating: Density	ASTM D1475	NY
Surface Coating: Percent Solids	ASTM D2697	NY
Surface Coating: Percent Water	EPA 24	NY
Surface Coating: Volatile Content	EPA 24 / ASTM D2369	NY

Solid Chemical Materials

Element/Test	Method	Accreditation(s)
TCLP	EPA 1311(Sample Preparation Method)	NY, LA, OK
Lead in Soil	EPA 3050B/ EPA 6010C	ELLAP, OH, NY, LA, OK
Lead in Paint	EPA 3050B/ EPA 6010C	ELLAP, OH, NY, LA
Lead in Paint	ASTM D 3335-85A/ EPA 6010C	NY
Lead in Dust Wipes	EPA 3050B/ EPA 6010C	NY, LA
Lead in Dust Wipes	EPA 600/R-93/200/ EPA 6010C	ELLAP, OH
Ignitability	EPA 1010A	NY

	Non-Potable Water / Analysis by ICP		Solid Chemical Materials	
Element/Test	Method	Accreditation(s)	Method	Accreditation(s)
Arsenic	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Barium	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Cadmium	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Chromium	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Copper	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Lead	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA, OK
Mercury	EPA 245.1 Rev.3/ EPA 7470A	NY, LA, OK	EPA 7471B	NY, LA
Nickel	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Selenium	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Silver	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Zinc	EPA 6010C/ EPA 200.7 Rev 4.4	NY, LA, OK	EPA 6010C	NY, LA
Cobalt	----	----	EPA 6010C	NY, LA
Manganese	----	----	EPA 6010C	NY, LA
Acid Digestion	EPA 3010A	NY, LA	EPA 3050B	NY, LA