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July 24, 2015

TO: LOCSD Board of Directors

FROM: Margaret Falkner, Utility Compliance Technician III
Rob Miller, District Engineer
William D. Bellis, Registered Civil Engineer

SUBJECT: **Agenda Item 11F – 8/6/2015 Board Meeting**
Authorize Formal Bid Process for Repairs on 16th Street Tanks

DESCRIPTION

In a recent inspection of the Los Osos Community Services District's 16th Street tanks, areas of limited corrosion were noted that require immediate repair. The repairs will extend the time required for a full recoating, and are expected to cost approximately $40,000. Consistent with the District's purchasing policy, a formal bid process is recommended.

STAFF RECOMMENDATION

Staff recommends that the Board adopt the following motion:

Motion: I move that the Board authorize Advantage Technical Services to begin the formal bid process and bring back award to the lowest responsive bidder at the November 5, 2015 Board of Directors meeting.

DISCUSSION

The District's 16th Street drinking water storage tanks latest inspection was done on March 25, 2015. During inspection, concentrated corrosion was noted in scattered areas on both north and south tanks. Recommendations were noted and the Utilities Department crew took care of some of these concerns. What remains are spot repairs that require the work of a specialized contractor. A full recoat of the interior and exterior of these tanks will be budgeted in approximately ten years. The intent of this project is to provide spot repairs which will help control corrosion, prevent more expensive welded repairs and extend the life of the existing coatings.

FINANCIAL IMPACT

Funding for bid services will be coded to general ledger code 7320, Professional & Consulting Services, in fund 500, Water.

Attachments

DIVE INSPECTION REPORT FOR

LOS OSOS COMMUNITY SERVICES DISTRICT'S

16TH ST. SOUTH TANK

MARCH 25TH, 2015

ADVANTAGE TECHNICAL SERVICES, Inc.

Specialty Engineering & Inspection Company

(805)595-2282

DIVE INSPECTION REPORT FOR LOS OSOS COMMUNITY SERVICES DISTRICT'S 16TH ST. SOUTH TANK

MARCH 25TH, 2015

REVISION DATE: N/A

PREPARED BY:

ADVANTAGE TECHNICAL SERVICES, INC.

6661 FERN CANYON LANE

SAN LUIS OBISPO, CA 93401

805-595-2282

UNDER THE SUPERVISION OF:

WILLIAM D. BELLIS

Registered Civil Engineer, CA C55334

EXECUTIVE SUMMARY

Advantage Technical Services, Inc. (ATS) accessed the Los Osos Community Services District's 16th St. South, Water Storage Reservoir in order to complete an inspection and provide maintenance. The tank was entered using sanitary diving and confined space procedures with potable water dedicated equipment. Sediment was removed from the tank's interior bottom by vacuuming. The coatings and structure were visually inspected.

The condition of the submersed interior coatings is good. Six small rust spots on the bottom were repaired by the diver. The interior roof coatings are in good condition overall but staining and advancing corrosion are present from between the rafters and roof plate.

The worst corrosion on the tank is at scattered areas on the exterior roof, shell and various appurtenances. Concentrated corrosion and metal loss are present at these locations. Many of these were treated with a rust converting primer by ATS to temporarily slow the corrosion.

Spot repair of the exterior corrosion is our primary recommendation for this tank but this should be conducted within a worker protection program for operations around lead based paint. Other recommendations are included at the end of this report.

SCOPE, OBJECTIVE, AND LIMITATIONS

An inspection was completed on the interior and exterior of the welded steel potable water storage reservoir located on 16th St. in Los Osos, California on March 25th, 2015. The tank interior was inspected while it contained approximately thirty-eight feet of water. Principle Inspector/Engineer, Will Bellis, P.E. and ATS associates provided the tank inspection.

ATS divers have experience and certifications that meet or exceed the requirements of AWWA C652 Standard for Disinfection of Water Storage Facilities and OSHA regulations for technical or commercial diving. Additionally, our team's certifications or licenses include a Registered Professional Engineer, API 653 Tank Inspector, AWS Certified Welding Inspector, National Association of Corrosion Engineers Level III Coating Inspector, and American Society of Nondestructive Testing Level III Inspector. With these applicable credentials, our team exceeds any other in the industry. The dive team has combined experience of over five hundred tank dive inspections.

ATS completed the internal inspection using sanitary diving procedures that conform to the American Water Works Association Standard for Disinfection of Water-Storage Facilities (ANSI/AWWA C652-02). All equipment is specifically dedicated to potable water diving and is disinfected with a solution of two hundred parts per million chlorine from sodium hypochlorite immediately prior to tank entry. The diver is prevented from coming in contact with the water by a full diving "dry suit" with locking seals at the hands and permanently connected booties and hood. The diver's full face mask is securely sealed to the dive suit hood in order to contain saliva and prevent skin contact with the water. The dry suits are made of a urethane or vinyl material that is ideal for disinfection. The diver's air supply is supplied by air hoses from the surface using either a dive compressor or bottled air. The diver's air supply system offers triple redundancy; including a self-contained system

maintained in the diver's possession and control. A full-time communication system supports documentation of findings and operational or emergency communications. All disinfection procedures are in accordance with the American Water Works Association Standard for Disinfection of Water-Storage Facilities (ANSI/AWWA C652-02).

The photographs provided within this report display representative views and subsequent analysis. Digital video, also included, provides additional documentation of the conditions.

The observations made during the inspection, and included in this report, provide a reasonable evaluation of the tank conditions at the time of the inspection. Considerations of safe access and reasonable care were observed in making and reporting the observations. Latent defects or conditions found during subsequent cleaning, inspections, or other work at the tank must be brought to the Engineer's or Owner's attention.

OBSERVATIONS

General Tank Data

Type: ground-supported welded steel reservoir
Media Stored: potable water
Diameter: 46'-0" (unverified)
Height: 42'-6" (measured shell height)
Water level during inspection: 38'

Foundation

The tank is supported by a concrete ring footing which is in good condition.

Exterior Shell

The tank is known to have lead based exterior coatings. The exterior was spot repaired and over-coated in 2008.

The coating is in good condition overall but significant concentrated corrosion is present at scattered locations such as at the shell to roof junction, the chime and on anchor chairs.

Exterior Roof

The coating condition is similar to the shell with increased signs of aging such as chalking due to accelerated aging from higher temperatures. Some spots of general corrosion exist around the vent, near the shell joint, around cathodic protection (CP) hand holes, anchor points and around the base of the guardrail posts.

The non-skid coating is present and is in good condition.

ATS provided spot preparation and application of a rust converting primer to stabilize the most serious areas of corrosion.

Interior Bottom

This tank is being protected by epoxy interior coatings that were applied during a rehabilitation project in 2008. The coatings on the bottom are in good condition. Six small rust points were noted and repaired by the diver using an NSF approved 100% solids epoxy that cures underwater.

A layer of brown colored fine sand was present over the entire bottom. The sediment depth was 1/8 to 1/4 inch thick. ATS removed the sediment by vacuuming.

Interior Shell

The condition of the interior shell coatings is good. No rust points were noted.

Interior Roof Plate

The interior roof coatings are in good condition overall. The interior lap joints and shell to roof joint are caulked. The caulking appears to be sound and rust staining has been effectively reduced below normal.

Roof Structure

The accessible areas of the roof rafters are in good condition. Active corrosion on the rafter tops is indicated by staining. Debris on the bottom of the tank appeared to be paint strips from the edges of the top rafter flanges where advancing corrosion has lifted the epoxy coating.

The center column and base plate are in good condition. Coatings are effectively protecting corrosion in these areas. The "dollar plate" on the top of the column is being affected by corrosion. Staining around the edge of the plate is visible. A significant source of the staining is likely to be the inaccessible areas that are present on this portion of the roof structure.

Cathodic Protection System

The cathodic protection system components appear to be in normal operating condition. Handhole covers and associated fasteners, however, are a location of significant corrosion.

Appurtenances

Level Gage: The half scale level gage is operational. All components appear to be in normal operating condition.

Exterior Ladder: The exterior ladder is in good condition. The guardrail on the roof is in fair condition overall but serious concentrated corrosion is present. Fall protection anchor points are present.

Interior Ladder: The interior ladder is in good condition overall a few rust points are present.

Overflow: The accessible portions of the overflow are in good condition. No significant corrosion was present. The inlet was out of the reach of the diver and was not inspected.

Outlet: The outlet nozzle appears to be in good condition overall.

Inlet: The high inlet is in good condition overall. Some concentrated corrosion is present.

Shell Drain: Both shell drains are in good condition.

Manways: Shell manways are in good condition.

Roof Hatch: One lockable roof hatch is located at the top of the interior ladder. The hatch was locked upon arrival and was in good condition.

Roof Vent: The vent appears to be designed and in a condition that will prevent the entry of rainwater or runoff, birds, insects, rodents, or other animals. The cover was not removed but the interior condition appears to be good. The screen is clean.

RECOMMENDATIONS

1. Plan to complete spot repairs on the exterior of this tank soon. ATS provided spot preparation and application of rust converting primer to stabilize some areas but this work will only provide temporary protection. A firm specializing in corrosion prevention, such as ATS, could help achieve effective repair through planning and development of appropriate specifications. Safe access and consideration of the hazards of working on the lead based coatings must be considered. Contractors working on lead based coatings must have an appropriate worker protection program.

2. Use a rust converter on the chine area (bottom plate extension) to slow corrosion. Also, consider caulking to prevent moisture intrusion from condensate.

3. Plan to recoat the interior and exterior of this tank on in approximately 10 years.

4. The roof guardrail opening at the ladder is un-protected. Instruct and document training of personnel on the use of fall protection and other applicable safety procedures when working on tank roofs and other elevated locations.

5. Provide annual inspections of the exposed side of the tank shell to bottom connection pursuant to AWWA D100-11. Weeds, dirt, and foreign materials should be removed from this area to eliminate or reduce trapped moisture and associated corrosion.

6. Provide inspection of the interior and exterior along with corrective maintenance at the recommended interval of every three years pursuant to AWWA D100-11 (Forward, Section III, pg. XX). As in the case of this work, combining the internal inspection with sediment removal will provide optimal inspection conditions.

DIVE INSPECTION REPORT FOR

LOS OSOS COMMUNITY SERVICES DISTRICT'S

16TH ST. NORTH TANK

MARCH 25TH, 2015

ADVANTAGE TECHNICAL SERVICES, Inc.
Specialty Engineering & Inspection Company
(805)595-2282

DIVE INSPECTION REPORT FOR LOS OSOS COMMUNITY SERVICES DISTRICT'S 16TH ST. NORTH TANK

MARCH 25TH, 2015

REVISION DATE: N/A

PREPARED BY:

ADVANTAGE TECHNICAL SERVICES, INC.

6661 FERN CANYON LANE

SAN LUIS OBISPO, CA 93401

805-595-2282

UNDER THE SUPERVISION OF:

WILLIAM D. BELLIS

Registered Civil Engineer, CA C55334

EXECUTIVE SUMMARY

Advantage Technical Services, Inc. (ATS) accessed the Los Osos Community Services District's 16th St. North, Water Storage Reservoir in order to complete an inspection and provide maintenance. The tank was entered using sanitary diving and confined space procedures with potable water dedicated equipment. Sediment was removed from the tank's interior bottom by vacuuming. The coatings and structure were visually inspected.

The condition of the submersed interior coatings is good. The interior roof coatings are beginning to fail and allow general corrosion on approximately 5% of the area. No significant metal loss is present at these locations. The diver applied epoxy to the top two rungs of the interior ladder where significant corrosion was present.

The worst corrosion on the tank is at scattered areas on the exterior roof and various appurtenances. Concentrated corrosion and metal loss are present at these locations. Many of these were treated with a rust converting primer by ATS to temporarily slow the corrosion.

Spot repair of the exterior corrosion is our primary recommendation for this tank but this should be conducted within a worker protection program for operations around lead based paint. Other recommendations are included at the end of this report.

SCOPE, OBJECTIVE, AND LIMITATIONS

An inspection was completed on the interior and exterior of the welded steel potable water storage reservoir located in Los Osos, California on March 25, 2015. The tank interior was inspected while it contained approximately thirty-eight feet of water. Principle Inspector/Engineer, Will Bellis, P.E. and ATS associates provided the tank inspection.

ATS divers have experience and certifications that meet or exceed the requirements of AWWA C652 Standard for Disinfection of Water Storage Facilities and OSHA regulations for technical or commercial diving. Additionally, our team's certifications or licenses include a Registered Professional Engineer, API 653 Tank Inspector, AWS Certified Welding Inspector, National Association of Corrosion Engineers Level III Coating Inspector, and American Society of Nondestructive Testing Level III Inspector. With these applicable credentials, our team exceeds any other in the industry. The dive team has combined experience of over five hundred tank dive inspections.

ATS completed the internal inspection using sanitary diving procedures that conform to the American Water Works Association Standard for Disinfection of Water-Storage Facilities (ANSI/AWWA C652-02). All equipment is specifically dedicated to potable water diving and is disinfected with a solution of two hundred parts per million chlorine from sodium hypochlorite immediately prior to tank entry. The diver is prevented from coming in contact with the water by a full diving "dry suit" with locking seals at the hands and permanently connected booties and hood. The diver's full face mask is securely sealed to the dive suit hood in order to contain saliva and prevent skin contact with the water. The dry suits are made of a urethane or vinyl material that is ideal for disinfection. The diver's air supply is supplied by air hoses from the surface using either a dive compressor or bottled air. The

diver's air supply system offers triple redundancy; including a self-contained system maintained in the diver's possession and control. A full-time communication system supports documentation of findings and operational or emergency communications. All disinfection procedures are in accordance with the American Water Works Association Standard for Disinfection of Water-Storage Facilities (ANSI/AWWA C652-02).

The photographs provided within this report display representative views and subsequent analysis. Digital video, also included, provides additional documentation of the conditions.

The observations made during the inspection, and included in this report, provide a reasonable evaluation of the tank conditions at the time of the inspection. Considerations of safe access and reasonable care were observed in making and reporting the observations. Latent defects or conditions found during subsequent cleaning, inspections, or other work at the tank must be brought to the Engineer's or Owner's attention.

OBSERVATIONS

General Tank Data

Type: ground-supported welded steel reservoir
Media Stored: potable water
Original construction: CB&I 1967
Seismic Retrofit: New bottom shell ring, foundation and anchors 2006
Diameter: 40'-0" (unverified)
Height: 43'-0" (measured shell height)
Water level during inspection: 38'

Foundation

The tank is supported by a concrete ring footing which is in good condition.

Exterior Shell

Our records show that the lowest shell ring was replaced during earthquake repairs in 2006. The rest of the tank is known to have lead based exterior coatings. The exterior was spot repaired and over-coated in 2008.

The coating is in good condition overall but significant concentrated corrosion is present at scattered locations such as on anchor chairs.

Exterior Roof

The coating condition is similar to the shell with increased signs of aging such as chalking due to accelerated aging from higher temperatures. Some spots of general corrosion exist near the shell joint, around cathodic protection (CP) hand holes anchor points and around the base of the guardrail posts.

The non-skid coating is present and is in good condition.

ATS provided spot preparation and application of a rust converting primer to stabilize the most serious areas of corrosion.

Interior Bottom

This tank is being protected by epoxy interior coatings that were applied during a rehabilitation project in 2006. The coatings on the bottom are in good condition. No rust points were noted.

A layer of brown colored fine sand was present over the entire bottom. The sediment depth was 1/8 to 1/4 inch thick. ATS removed the sediment by vacuuming.

Interior Shell

The condition of the interior shell coatings is good. No rust points were noted.

Interior Roof Plate

The interior roof coatings are aging and failing in some areas. General corrosion and associated staining are present on approximately 5% of the surface area. The areas near the shell to roof joint and around the roof vent have higher concentrations of corrosion. No significant metal loss was noted so the plate itself is in good condition.

Roof Structure

No specific structural members are used in the dome roof other than the compression ring that is located at the shell to roof joint. The roof plates themselves provide a structural shell. The condition of the roof plates is reported in the previous section. The compression ring is generally in fair condition. Most of the surfaces are being protected adequately by the coating system.

Cathodic Protection System

The cathodic protection system components appear to be in normal operating condition. Handhole covers and associated fasteners, however, are a location of significant corrosion.

Appurtenances

Level Gage: No level gage is present on the north tank. The half scale level gage on the south tank is operational.

Exterior Ladder: The exterior ladder is in good condition. The guardrail on the roof is in good condition overall but some serious concentrated corrosion is present. Fall protection anchor points are present.

Interior Ladder: The interior ladder is in good condition overall except the top two rungs had serious corrosion which was spot coated by the diver.

Overflow: The accessible portions of the overflow are in good condition. No significant corrosion was present. The inlet was out of the reach of the diver and was not inspected.

Outlet: The outlet nozzle appears to be in good condition overall.

Inlet: The high inlet is in good condition overall. Some concentrated corrosion is present.

Shell Drain: Both shell drains are in good condition.

Manways: Shell manways are in good condition.

Roof Hatch: One lockable roof hatch is located at the top of the interior ladder. The hatch was locked upon arrival and was in good condition.

Roof Vent: The vent appears to be designed and in a condition that will prevent the entry of rainwater or runoff, birds, insects, rodents, or other animals. The cover was not removed but the interior condition appears to be good. The screen is clean.

RECOMMENDATIONS

1. Plan to complete spot repairs on the exterior of this tank soon. ATS provided spot preparation and application of rust converting primer to stabilize some areas but this work will only provide temporary protection. A firm specializing in corrosion prevention, such as ATS, could help achieve effective repair through planning and development of appropriate specifications. Safe access and consideration of the hazards of working on the lead based coatings must be considered. Contractors working on lead based coatings must have an appropriate worker protection program.

2. Use a rust converter on the chine area (bottom plate extension) to slow corrosion. Also, consider caulking to prevent moisture intrusion from condensate.

3. The coatings on the interior roof are exhibiting much more advanced degradation than the interior shell or bottom. Consider spot repairs of the interior roof to extend the life of the overall coating system.

4. Plan to recoat the interior and exterior of this tank in approximately 10 years.

5. The roof guardrail opening at the ladder is un-protected. Instruct and document training of personnel on the use of fall protection and other applicable safety procedures when working on tank roofs and other elevated locations.

6. Provide annual inspections of the exposed side of the tank shell to bottom connection pursuant to AWWA D100-11. Weeds, dirt, and foreign materials should be removed from this area to eliminate or reduce trapped moisture and associated corrosion.

7. Provide inspection of the interior and exterior along with corrective maintenance at the recommended interval of every three years pursuant to AWWA D100-11 (Forward, Section III, pg. XX). As in the case of this work, combining the internal inspection with sediment removal will provide optimal inspection conditions.