

INVITATION FOR BIDS

RANCHO SANTA FE RESERVOIR MODIFICATIONS AND COATING PW17-010 (WA1372)

Addendum No. 2

Date: September 29, 2016

From: Mike Smith, Department Representative

Subject: Addendum No. 2 to Solicitation No. PW17-010

Bid Deadline: October 5, 2016; 3:00 p.m. (local time, Phoenix, Arizona)

SCOPE

This Addendum forms a part of the Contract and clarifies, corrects, or modifies the original Invitation for Bids document prepared by the City of Avondale. Acknowledge receipt of this Addendum in the space provided on the attached "Acknowledgment of Addenda Received" form. This acknowledgement must accompany the submitted bid. Failure to do so shall subject the bidder to disqualification.

This Addendum No. 2 consists of modifications to (i) Article II (Bid Process; Bid Award), Section 2.1 (Purpose/Scope of Work), (ii) Exhibit A (Specifications, Plans/Construction Drawings) and (iii) Exhibit C (Price Sheet) of the Invitation for Bids No. PW 17-010, released on September 14, 2016, as modified by Addendum No. 1, released on September 15, 2016.

ADDENDUM

1. Article II (Bid Process; Bid Award), Section 2.1 (Purpose/Scope of Work) is deleted in its entirety and replaced with the following:

2.1 Purpose/Scope of Work. The Work included in this Project consists of the repair and recoating of a 1.75 MG steel reservoir, replacement of a **24**-inch gate valve and other miscellaneous work. The recoating Work will include a high solids coating application. The Project is located at 12550 West McDowell Road, Avondale, Arizona. The City is issuing this IFB is to secure a qualified Arizona General Engineering Class A **or Painting and Wall Covering Class CR-34** Licensed Contractor to perform the Work and provide Materials as more

particularly described in the Specifications attached hereto as Exhibit A, and incorporated herein by reference. Bidders must submit Bids encompassing the entire Project, inclusive of the related Plans and/or Construction Drawings. Failure to do so may result in a determination that the Bid is non-responsive.

2. Exhibit A (Specifications, Plans/Construction Drawings) is hereby modified to delete the Technical Specifications in their entirety and replace them with the Technical Specifications, revised September 28, 2016, attached hereto as Exhibit 1 and incorporated herein by reference. A summary of the revisions follows the revised Technical Specifications.
3. Exhibit A (Specifications, Plans/Construction Drawings) is hereby modified to delete Plan Sheets 2, 4, and 5 in their entirety and replace them with Plan Sheets 2, 4, and 5, revised September 26, 2016, attached hereto as Exhibit 2 and incorporated herein by reference.
4. Exhibit C (Price Sheet) is hereby deleted in its entirety and replaced with the Price Sheet attached hereto as Exhibit 3 and incorporated herein by reference.

EXHIBIT 1
TO
ADDENDUM NO. 2
TO
INVITATION FOR BIDS NO. PW 17-010

[Technical Specifications and Revision Summary]

See following pages.



TECHNICAL SPECIFICATIONS

Rancho Santa Fe Reservoir Modifications and Coating

(PW17-010)

September 2016

Revised September 28, 2016



EXPIRATION DATE: 09/30/18

Prepared By:



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TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01030	SUMMARY OF WORK
01040	ORDER OF CONSTRUCTION
01060	SPECIAL CONDITIONS
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DIVISION 13 - SPECIAL CONSTRUCTION

13208	MISCELLANEOUS WORK ASSOCIATED WITH WELDED STEEL STORAGE RESERVOIRS
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15115	GATE VALVES AND APPURTENANCES



EXPIRATION DATE: 09/30/18

DIVISION 1
GENERAL REQUIREMENTS

SECTION 01030

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Identification and summary description of the Work, location, OWNER furnished equipment, Work by OWNER, activities by others, and coordination.

1.02 THE WORK

- A. The Work consists of miscellaneous improvements, and surface preparation and coating of one 1,750,000 gallon water storage reservoir.

1.03 LOCATION OF PROJECT

- A. The Project is located at 12550 W. McDowell Rd, Avondale, Arizona.

1.04 OWNER FURNISHED EQUIPMENT

- A. None

1.05 WORK BY THE OWNER

- A. Drain and isolate the reservoir.
- B. Remove the impressed current cathodic protection system components located on and within the reservoir before draining the reservoir. Reinstall the cathodic protection system after CONTRACTOR completes coating and before CONTRACTOR begins disinfection of the reservoir.
- C. Remove and reinstall the existing reservoir pressure sensor and piping.
- D. Collect water samples after the CONTRACTOR has completed disinfection of the reservoir and conduct bacteriological test.

1.06 ACTIVITIES BY OTHERS

- A. OWNER, utilities, and others may perform activities within Project area while the Work is in progress:
 - 1. Schedule the Work with OWNER, utilities, and others to minimize mutual interference.

- B. Cooperate with others to minimize interference and delays:
 - 1. When cooperation fails, submit recommendations and perform Work in coordination with work of others as directed.
 - 2. When the Work depends on proper execution or on results of the work performed by others, inspect and promptly report apparent discrepancies or defects in work performed by others.

1.07 OPERATION OF EXISTING FACILITIES

- A. There are existing operational facilities at this site. The booster station and second water storage reservoir on the site are operational. All work must be scheduled with the OWNER to avoid interference with existing facilities. Refer to Section 01040 for additional requirements:
 - 1. Any damage to existing property/equipment must be replaced to original working conditions.

1.08 COORDINATION OF WORK

- A. Maintain overall coordination of the Work:
 - 1. CONTRACTOR shall be solely responsible for coordination of all of the work. Supervise, direct and cooperate fully with all subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies and all others whose services, materials or equipment are required to ensure completion of the work within the Contract time.
 - 2. CONTRACTOR shall cooperate with and coordinate work with the work of any other contractors, utility service companies or OWNER's employees performing additional work related to the Project site.
 - 3. CONTRACTOR shall coordinate work with the work of others to assure compliance with schedules.
 - 4. CONTRACTOR shall attend and participate in all project coordination or progress meetings and report on the progress of all work and compliance with construction schedule.

1.09 POTABLE WATER SUPPLY PROTECTION

- A. All materials of construction which may come into contact with drinking water shall conform to NSF International Standards 60 and 61.

1.10 PERMITS

- A. CONTRACTOR shall include the cost for and obtain all construction related permits. These permits include, but are not limited to:
 - 1. Necessary permits for discharge of hydrostatic test water and chlorinated water used to disinfect piping and equipment.
 - 2. City of Avondale construction permit. No fee is required for this permit.

1.11 SAFETY PLAN

- A. CONTRACTOR shall submit a safety plan in compliance with Occupational Safety and Health Administration (OSHA) and Confined Space Requirements.

1.12 CONTRACTOR'S USE OF PREMISES

- A. CONTRACTOR shall limit his use of the premises for Work and storage, and allow for work by other contractors/subcontractors. CONTRACTOR shall store materials and equipment on north portion of site.
- B. CONTRACTOR assumes full responsibility for the protection and safekeeping of products and materials CONTRACTOR has stored on the site.
- C. CONTRACTOR shall move any stored products, or materials, under CONTRACTOR's responsibility, which interfere with operations of OWNER and separate contractors/subcontractors.
- D. CONTRACTOR shall obtain and pay for the use of any additional storage or work areas if needed for CONTRACTOR's operations.
- E. CONTRACTOR shall be solely responsible for the location/identification of materials storage, equipment storage, and employee and subcontractor parking areas, subject to the approval of the OWNER.
- F. CONTRACTOR shall restore any areas used for materials storage, equipment storage, or employee and subcontractor parking to their original condition or better, unless specified otherwise.

1.13 MAINTENANCE OF TRAFFIC

- A. Conduct Work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- B. Do not close any public street or portion thereof without first notifying and receiving approval from the local Fire Department and Police Department. Conduct operations to minimize interference with emergency vehicle access.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01040

ORDER OF CONSTRUCTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Order of construction activities to allow the OWNER normal operation of the existing facilities located on the Project site.

- B. Related Sections include, but are not necessarily limited to:
 - 1. Division 1.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

- A. Milestone Dates - The construction duration to reach final completion shall not exceed 154 calendar days. CONTRACTOR shall also comply with the following interim dates of completion:

Task	Interim Completion Date (days after Notice To Proceed)
Complete cleaning of Reservoir	10
Perform reservoir inspection of interior	15
Complete Reservoir structural modifications and recoating	120
Complete disinfection of Reservoir and obtain negative bacteriological test result	134
Final acceptance and punch list	154

- 1. The OWNER anticipates awarding of a contract on October 17, 2016, and issuing the Notice to Proceed on November 14, 2016.

- B. Tie-ins shall be coordinated with the OWNER and shall be scheduled as to minimize the disruption of services:
1. At no time shall CONTRACTOR or his employees modify operation of the existing facilities or start construction modifications without approval of the OWNER.
 2. CONTRACTOR shall plan his work to allow OWNER access to existing facilities to perform maintenance and repair work on existing facilities.
 3. Operation of existing valves shall only be performed by OWNER's personnel.
- C. The following is a suggested construction sequence for the project which the CONTRACTOR should consider in developing his overall plan of construction. This is not intended to release the CONTRACTOR from the responsibility to coordinate the work in any manner which shall insure project completion within the time allowed:
1. Remove and replace existing 24" gate valve.
 2. The OWNER will drain the reservoir. The OWNER will retain Corrpro Companies to remove the impressed current protection system components located on and inside the reservoir.
 3. Clean the reservoir. The entire reservoir floor is covered with an average of 1/8-inch thick layer of sediments.
 4. OWNER, CONTRACTOR, and ENGINEER to conduct structural inspection of interior of reservoir and identify scope of improvements.
 5. Perform modifications as shown on the drawings and identified during structural inspection.
 6. Perform work associated with surface preparation of interior of reservoir.
 7. Install coating on interior of reservoir.
 8. Perform work associated with surface preparation and coating on exterior of reservoir.
 9. The OWNER will retain Corrpro Companies to reinstall the impressed current protection system components for the reservoir.
 10. Disinfect, fill, and obtain negative bacteriological test results for the reservoir.
 11. Complete punchlist items.

END OF SECTION

SECTION 01060

SPECIAL CONDITIONS

PART 1 GENERAL

1.01 CONTRACTOR'S STORAGE TRAILERS (Applicable as needed or utilized)

- A. Establish at site of Project subject to approval of OWNER (as necessary and not mandatory).
- B. Remove storage trailers from site upon acceptance of the entire Work by the OWNER.
- C. Maintenance:
 - 1. CONTRACTOR shall provide all weekly maintenance and upkeep of trailer and equipment. Equipment breakdowns shall be repaired promptly by CONTRACTOR.
 - 2. Pay all utilities costs.
 - 3. Maintain at least until acceptance of the entire Work by the OWNER or until otherwise suspended by the OWNER.

1.02 ENGINEER/OWNER FIELD OFFICE

- A. Field office is not required. Project meetings shall be held at the OWNER'S Municipal Operations Service Center at 399 E. Lower Buckeye Road, Avondale.

1.03 SITE MAINTENANCE AND TEMPORARY PAINTING

- A. Paint and maintain in good repair temporary structures, fences, barricades and related items.
- B. Keep site clean of debris. Store and stockpile materials in an orderly manner and protect against damage.

1.04 TESTING

- A. Except as set out in other sections of Contract Documents, payment and responsibility for testing is as follows:
 - 1. Unless specifically stated otherwise in individual sections of specifications or Drawings, required testing, testing procedures, reports, certificates, and costs associated with all phases of securing required satisfactory test information which may be required by individual sections of specifications or Drawings is the full responsibility of the CONTRACTOR.
 - 2. Testing performed by OWNER shall include microbiological sampling and testing of water samples from disinfection tests for the reservoir.

1.05 PROJECT MEETINGS

- A. The OWNER/ENGINEER shall conduct a preconstruction conference and progress meetings involving:
 - 1. CONTRACTOR's Project Manager.
 - 2. CONTRACTOR's Project Superintendent.
 - 3. OWNER's designated Representative(s).
 - 4. ENGINEER's designated Representative(s).
 - 5. CONTRACTOR's Subcontractors as appropriate to the work in progress.
- B. Progress meetings will be held bi-weekly at a location designated by OWNER.
- C. The ENGINEER shall take meeting minutes and distribute copies of meeting minutes to the designated recipients. Corrections, additions or deletions to the minutes shall be noted and distributed as required.
- D. The CONTRACTOR shall have available at each meeting up-to-date red line as-built drawings.

1.06 SPECIAL CONSIDERATIONS

- A. CONTRACTOR shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site:

1.07 CONSTRUCTION SCHEDULE

- A. The CONTRACTOR shall prepare a construction schedule:
 - 1. The CONTRACTOR shall submit a complete gantt chart to the OWNER at the pre-construction meeting. The schedule shall cover the CONTRACTOR's anticipated time schedule.
 - 2. The schedule shall show the following:
 - a. The schedule shall be time-scaled in calendar weeks.
 - b. The schedule shall show the order and interdependence of activities and the sequence of work.
 - c. The schedule shall include, in addition to all construction activities, such tasks as mobilization and demobilization, submittal and approval of samples of materials and shop drawings, procurement of significant materials and equipment, fabrication of special items, surface preparation, coating application, installation, disinfection, cleanup, and interfacing with other projects /contractors / utility companies, etc.
 - 3. The CONTRACTOR shall provide an updated schedule every month commencing from notice to proceed in conformation with the following:
 - a. The OWNER or ENGINEER shall determine if the schedule requires revision in whole or in part, and shall so inform the CONTRACTOR of noncompliance with Contract schedule within 5 calendar days.

- b. The schedule shall be accompanied by a narrative description of progress, problem areas, and current and anticipated delaying factors and their anticipated effect, and any correction actions proposed or taken.
 - 4. At each progress meeting the CONTRACTOR shall provide a two week look ahead schedule.
 - 5. Acceptance of the CONTRACTOR's schedule by the OWNER is not to be construed as relieving the CONTRACTOR of his obligation to complete the Contract work within the Contract time.
- B. The CONTRACTOR shall plan construction activities between work hours Monday through Friday as defined in Article III - General Terms and Conditions.
- 1. The schedule shall identify the Work to be performed, including the location and duration of planned activities.
 - 2. The CONTRACTOR shall be responsible for payment for all overtime and off-hours inspection for ENGINEER and testing that occur outside the normal and expected working hours.

1.08 SITE SECURITY

- A. CONTRACTOR shall store small equipment and tools in secure, locked storage containers at the end of the work day.
- B. CONTRACTOR assumes all risk associated with leaving construction materials, tools, vehicles, and equipment on site. OWNER is not liable for any damages or theft.

1.09 EXISTING SITE ACCESS ROADS

- A. At completion of construction, the CONTRACTOR shall repair damage he caused to site roads and site work.

1.10 SCHEDULE OF VALUES

- A. CONTRACTOR'S Schedule of Values shall be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.
- B. No line item in the Schedule of Values shall exceed \$300,000.
- C. The Schedule of Values shall include a separate line item for mobilization (Mobilization), valued at not more than five (5) percent of the Contract Price. Mobilization shall consist of, but not be limited to, all preparatory work, preliminary operations, and incurred costs necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for the establishment of all offices, buildings, and other facilities needed for the project prior to beginning work at the project site.

D. Close-out Items:

1. The Schedule of Values shall include a separate line item for close-out and completion of punchlist items (Close-out), valued at not less than five (5) percent of the Contract Price, representing the faithful final completion of the Work, including but not limited to correction of incomplete or deficient items identified in the final inspection; final cleaning and removal of temporary facilities and controls; preparation and delivery of operation and maintenance manuals, record drawings, and other project records and documents; completion of all required demonstrations and training; completion of all close-out submittals, and all other close-out procedure and requirements, if any, required for the project.
2. Any change in the Contract Price made in accordance with the Contract Documents shall be reflected by a proportionate change in the value assigned to Close-out.
3. Close-out shall be included in the CONTRACTOR'S final application for payment and paid for as part of the OWNER'S final payment hereof, assuming faithful completion of Close-out and satisfaction of any and all other conditions to such payment set forth in the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01072

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Prepare and maintain record documents for the project to accurately reflect the construction work as built. The record documents must be submitted at completion of the construction work as a condition of final acceptance of the Work by the OWNER.

1.02 MAINTENANCE OF RECORD DOCUMENTS

- A. The CONTRACTOR shall maintain at the project site one copy each of the following record documents:
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Design addenda.
 - 4. Reviewed shop drawings.
 - 5. Contract Change Orders and field orders.
 - 6. Supplemental drawings and written material provided by the ENGINEER to clarify the Contract Documents.
 - 7. Other contract modifications.
 - 8. Approved samples and/or sample results.
- B. The CONTRACTOR shall store the project record documents in an approved location apart from other documents. Record documents are not to be used for construction purposes. The CONTRACTOR shall provide files and racks as needed for orderly storage of the documents, maintain the documents in clean, dry, legible condition, and make the documents and samples available at all times for inspection by the ENGINEER.

1.03 MARKING DEVICES

- A. Mark all changes with red pencil or pen.

1.04 RECORDING

- A. The CONTRACTOR shall keep the record documents current with construction in progress. Completed construction work shall not be permanently concealed until required information has been recorded.

- B. The CONTRACTOR shall provide a rubber stamp for use in marking all project record documents. The stamp shall have a line border of approximately 4" x 1" with the words "PROJECT RECORD" printed inside the border.
- C. The CONTRACTOR shall neatly stamp, in red, each record document "PROJECT RECORD", and legibly mark the Contract Drawings to record actual construction deviations as follows:
 - 1. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - 2. Field changes of dimension and detail.
 - 3. Changes made by design addenda, change order or field order.
 - 4. Details not on original Contract Drawings.

1.05 SUBMITTAL

- A. Red line record drawings shall be available for review by the ENGINEER whenever an application for a monthly progress payment is made. The partial record drawings shall be up-to-date through the end of the progress payment application period.
- B. At completion of construction, and prior to the final inspection and final acceptance of the project by the OWNER, the CONTRACTOR shall deliver the project record documents to the ENGINEER bound into rolls of convenient size for ease of handling and properly labeled.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01210
CONTINGENCY ITEMS

PART 1 GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements governing Contingency Items.

1.02 CONTINGENCY ITEMS

- A. Contingency Items are available for sole use by OWNER.
- B. Bond, insurance, taxes, profit, and overhead shall be included in the Contingency Items amount on the Price Sheet.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SCHEDULE OF CONTINGENCIES

- A. See Section 13208.

END OF SECTION

SECTION 01331

REFERENCE FORMS

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Section contains the forms for CONTRACTOR to use in documenting Work required under this Contract. CONTRACTOR may use an alternative form if approved by ENGINEER that contains the required information and is in a similar format.
- B. The forms listed below may be referenced from other Sections in the Contract Documents. Forms will include, but will not be limited to the following:

<u>No.</u>	<u>Form Title</u>
1.	Request for Change Order Proposal
2.	Change Order Proposal
3.	Request for Information
4.	Contractor's Daily Construction Report
5.	Field Order
6.	Work Change Directive
7.	Shop Drawing Transmittal (See Section 01340)

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

REQUEST FOR CHANGE ORDER PROPOSAL

Date: _____

Contractor: _____

Project Name: Rancho Santa Fe Reservoir Modifications and Coating

Request for Change Order Proposal No. _____

NOTICE TO CONTRACTOR: Please submit a Change Order Proposal for the proposed modifications to the Contract Documents as described below. If acceptable, a Change Order will be issued to authorize the work. **THIS IS NOT A CHANGE ORDER FOR AUTHORIZATION TO PROCEED WITH THE WORK AS DESCRIBED!**

SCOPE OF WORK:

OWNER

CHANGE ORDER PROPOSAL

Date: _____

Contractor: _____

Project Name: Rancho Santa Fe Reservoir Modifications and Coating

Project No.

Change Order Proposal No.: _____

Dear Sir:

Certain items of extra work have been found necessary which are not covered by the Contract for the above referenced Project. Therefore, we submit the following amounts as the basis of compensation for such extra work:

JUSTIFICATION:

The Contract Time will be (increased)(decreased) _____ calendar days.

The Contract Amount will be (increased)(decreased) \$ _____ dollars.

By: _____

Title: _____

Contractor: _____

REQUEST FOR INFORMATION

Rancho Santa Fe Reservoir Modifications and Coating

Project Name _____	Project Owner _____
Contractor _____	RFI# _____
Requested By _____	Directed to _____
Subject _____	Date Received _____
Spec. Section _____	Date Transmitted _____
Drawing References _____	Date Reply Received _____
Date Reply Needed _____	Date Reply Transmitted _____

INFORMATION NEEDED:

Date: _____ Signature: _____

REPLY:

Date: _____ Signature: _____

WORK CHANGE DIRECTIVE

No. _____

PROJECT: Rancho Santa Fe Reservoir Modifications and Coating

DATE OF ISSUANCE _____ EFFECTIVE DATE _____

OWNER: Mohave County Public Works

CONTRACTOR: _____

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments: (List documents supporting change)

If a claim is made that the above change(s) have affected Contract Price or Contract Times, any claim for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:

- Unit Prices
- Lump Sum
- Other _____

Estimated increase (decrease) in Contract Price: \$ _____

If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Method of determining change in Contract Times:

- Contractor's records
- OWNER's records
- Other _____

Estimated increase (decrease) in Contract Times: Substantial Completion: _____ days

Ready for final payment: _____ days
If the change involves an increase, the estimated time is not to be exceeded without further authorization.

AUTHORIZED:

OWNER

By: _____

SECTION 01340
TECHNICAL SUBMITTALS SHOP DRAWINGS, PROJECT DATA & SAMPLES
OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 SUMMARY

- A. Article III - General Terms and Conditions, Part B – Performance of the Work, Section 3.38 that relates to shop drawings and samples shall be superceded by this Section 01340.
- B. General:
 - 1. Section Addresses:
 - a. Mechanics of shop drawing and operation and maintenance manual submittal and review process.
- C. Related Sections include but are not necessarily limited to:
 - 2. Division 1 - General Requirements.
 - 3. Sections in Divisions 2 through 15 identifying submittal requirements.
- D. Approval of Technical Submittals by ENGINEER or OWNER shall not relive CONTRACTOR of full responsibility for compliance with scope, intent, and performance in accordance with this Contract.

1.02 SUBMITTALS: GENERAL

- A. Transmit all technical submittals to:

Sriram Barigeda
NCS Engineers
202 E. Earll Drive, Suite 110
Phoenix, AZ 85012
Sriram@ncseng.com

- B. Utilize one copy of “Contractor’s Shop Drawing Transmittal” (Exhibit A-01340) Form to transmit all shop drawings and samples. Transmittals will not be received from or returned to subcontractors.
- C. Provide submittal information defining specific equipment or materials utilized on the project. Generalized product information not clearly defining specific equipment or materials to be provided will be rejected.
- D. Calculations required in individual specification sections will be received

for information purposes only and will be returned stamped “E”. Engineer’s Review Not Required” to acknowledge receipt.

- E. Assure submittals meet the following schedule:
 - 1. Shop drawings:
 - a. Submittal and approval prior to that portion of work being installed and prior to 50 overall percent completion.
 - b. ENGINEER will attempt to return all submittals to CONTRACTOR within 7 days of receipt.
 - 2. Operation and Maintenance Manuals and Data Record Sheets:
 - a. Initial submittal within 45 days after date shop drawings are approved.
- F. Final payment on the project shall not be made until final approved copies of all Operation and Maintenance Manuals have been received.
- G. Provide CONTRACTOR’s stamp of approval as indication of his checking and verification of dimensions and coordination with interrelated work.

1.03 SUBMITTALS: SHOP DRAWINGS

- A. Transmittal Mechanics:
 - 1. Utilize one copy of “Contractor’s Transmittal” Form.
 - 2. Number transmittals consecutively beginning with 1.
 - 3. Assure resubmitted items retain the original number but with an added suffix letter starting with “A”.
 - 4. Assure only one specification section is covered by one letter of transmittal.
 - 5. Provide breakout of each transmittal component on the “Contractor’s Transmittal” Form. Each component thus defined shall receive specific action by the ENGINEER. Define manufacturer, item, tag number, and Drawing/Specification reference, as applicable.
 - 6. Do not change the scope of any re-submittal from the original transmittals’ scope. If some components of the original transmittals are approved and others are not, the CONTRACTOR shall not resubmit the approved components in subsequent re-submittal packages, unless requested to do so by ENGINEER. Provide a summary sheet containing all components of the original transmittal at the front of each re-submittal. Indicate each component as either “approved”, “outstanding”, or “submitted for action”. Items previously approved shall be referenced to the transmittal in which approval was received. “Outstanding” items are defined as items unapproved and not yet resubmitted for action. “Submitted for action” shall indicate items which are included for review in the transmittal.

7. Provide submittals in pdf format and transmit to ENGINEER for review via e-mail.
8. Provide clear space (3 inch square) for ENGINEER stamping of each component.
9. Marks on transmittal by Contractor, mark reproducible transparencies with a rectangular box.
10. ENGINEER will return reviewed submittals in pdf format via e-mail.
11. In addition to final pdf, CONTRACTOR shall provide two (2) hard copies of final approved shop drawings.

B. Transmittal Contents:

1. Coordinate and identify shop drawing contents so that all items can be easily verified by the ENGINEER.
2. Identify equipment or material use, tag number, drawing detail reference, weight, and other project specific information.
3. Provide sufficient information together with technical cuts and technical data to allow an evaluation to be made to determine that the item submitted is in compliance with the Contract Documents.
4. Submit items like equipment brochures, cuts of fixtures, product data sheets or catalog sheets on 8½ x 11 inch pages. Indicate exact item or model and all proposed options. Larger sheets (11"x17" or 24"x36") should be folded into smaller sections to fit into the submittal package.
5. Include legible scale details, sizes, dimensions, performance characteristics, capacities, test data, anchoring details, installation instructions, storage and handling instructions, color charts, layout drawings, parts catalogs, rough-in diagrams, wiring diagrams, controls weights and other pertinent data. Arrange data and performance information in format similar to that provided in Contract Documents. Provide, at minimum, the detail provided in the Contract Documents.
6. If proposed equipment or materials deviate from the Specifications or Drawings in any way, clearly note the deviation and justify the said deviation in detail in a separate letter immediately following transmittal sheet. If explanation is not given, shop drawings will be returned without action.
7. Provide copy of applicable specification section annotated in red to indicate that all requirements have been met with the shop drawing.

1.04 SUBMITTALS: SAMPLES

- A. Identify sample as to: manufacturer, item, use, type, project designation, tag number, specification section or drawing detail reference, color, range, texture, finish and other pertinent data.
- B. Include application specific brochures, and installation instructions.

- C. Provide CONTRACTOR's stamp of approval on samples as indication of his checking and verification of dimensions and coordination with interrelated work.
- D. Resubmit samples of rejected items.
- E. Approved samples submitted or constructed, constitute criteria for judging completed work. Finished work or items not equal to samples will be rejected.
- F. Samples may be retained for comparison purposes and the CONTRACTOR shall remove samples when directed. CONTRACTOR shall include in bid all costs of furnishing and removing samples.

1.05 SUBMITTALS: OPERATION AND MAINTENANCE MANUALS

- A. Transmittal Mechanics:
 - 1. See Paragraph 1.02 and 1.03.
 - 2. Provide transmittal form for Operation and Maintenance Manual with original number of the shop drawing approved item plus a suffix "O-M".
 - 3. Submit one copy until approval is received.
 - 4. Acceptable submittals will be retained with the transmittal form returned with a request for two (2) final paper copies and two electronic copies on compact disk. Provide complete electronic copies of the entire O&M manual in PDF format. The entire O&M manual information for each specification section shall be included in a single PDF. Each PDF shall be appropriately labeled. This is required for all O&M manuals associated with this Project.
 - 5. Deficient submittals will be returned along with transmittal form which will be marked to indicate deficient areas.
 - 6. Identify resubmittals with the original number plus a suffix letter starting with "A."
 - 7. Submit Operation and Maintenance Manuals printed on 8-1/2" x 11" inch size high quality paper with standard three-hole punching and bound in stiff metal hinged binder constructed as a three-post style. Provide binders with titles. Tab each section of manuals for easy reference with plastic-coated dividers. Provide index for each manual.
 - 8. Reduce drawings or diagrams bound in manuals to an 8 1/2" x 11" inch or 11" x 17" inch size. However, where reduction is not practical to ensure readability, fold large drawings separately and place in vinyl envelopes which are bound into the binder. Identify vinyl envelopes with drawing numbers.
- B. Transmittal Content:
 - 1. Submission of Operation and Maintenance Manuals is applicable to but not necessarily limited to:

- a. Equipment such as meters, valves, pumps and feed system controls, electrical panels, and instrumentation.
 - b. Equipment used with electrical motor loads (pumps).
 - c. Specialized equipment including valves and instrumentation and control system components for process systems such as meters, recorders, and transmitters.
 - d. Valves and actuators.
2. Prepare operation and maintenance manuals which include, but are not necessarily limited to the following detailed information, as applicable:
- a. Equipment function, normal operating characteristics, limited operations.
 - b. Assembly, disassembly, installation, alignment, tolerances, adjustment, and checking instructions.
 - c. Operating instructions for start-up, routine and normal operation, regulation and control, shutdown, and emergency conditions.
 - d. Lubrication and maintenance instructions (including schedules).
 - e. Guide to “troubleshooting”.
 - f. Parts list (including material of construction) and predicted life of parts subject to wear.
 - g. Outline, cross-section, and assembly (exploded view) drawings; engineering data; and electrical diagrams, including elementary diagrams, wiring diagrams, connection diagrams, word description of wiring diagrams and interconnection diagrams.
 - h. Test data and performance curves.
 - i. A list of recommended spare parts with a price list.
 - j. Copies of installation instructions, parts lists or other documents packed with equipment when delivered.
 - k. Tag numbers relating the equipment back to the Contract Documents.
 - l. Safety instructions.
 - m. ISO identification numbers for bearings.
 - n. List of specialty tools required and availability.
 - o. List weight of overall assemblies and individual weights of major individual components.
 - p. List of vendors and who to contact for warranty work.
 - q. List of fastener grades.
 - r. Copy of warranty, if applicable.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTALS: APPROVAL OR REJECTION

- A. Items within Transmittals will be reviewed for overall design intent and will receive one of the following Actions:

- A - NO EXCEPTIONS TAKEN
- B - FURNISH AS NOTED
- C - REVISE AND RESUBMIT
- D - REJECTED
- E - ENGINEER'S REVIEW NOT REQUIRED

- B. Transmittals received will be initially reviewed to ascertain inclusion of CONTRACTOR's approval stamp. Drawings not stamped by the CONTRACTOR or stamped with a stamp containing language other than that specified in Paragraph 1.02 G will not be reviewed for technical content and will be returned without any action.
- C. Transmittals returned with disposition "A" or "B" are considered ready for fabrication and installation. If for any reason a transmittal that has an "A" or "B" disposition is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal. The CONTRACTOR shall assure that previously approved documents are destroyed when they are superseded by a resubmittal as such.
- D. Transmittals with disposition "A" or "B" combined with Action "C" (Revise and Resubmit) or "D" (Rejected), will be individually analyzed giving consideration as follows:
 - 1. The portion of the transmittal given "C" or "D" will not be distributed (unless previously agreed to otherwise at the Preconstruction Conference). One copy or the one transparency of the "C" or "D" drawings will be marked up and returned to the CONTRACTOR. It shall be the CONTRACTOR's responsibility to ensure that these items are corrected and resubmitted.
 - 2. Items marked "A" or "B" will be fully distributed.
 - 3. If a portion of the items or system proposed are acceptable, however, the major part of the individual drawings or documents are incomplete or require revision, the entire submittal may be given "C" or "D" action. This is at the sole discretion of the ENGINEER. In this case, some drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package." Distribution to the OWNER, CONTRACTOR, and ENGINEER will not be made (unless previously agreed to otherwise).
- E. Failure to include any specific information specified under the submittal paragraphs of the specifications shall result in the transmittal being returned to the CONTRACTOR unapproved.
- F. In addition to calculations stamped and returned "E. Engineer's Review Not Required", other transmittals such as submittals which the Engineer considers as "Not Required" and submittal information in a transmittal which have been reviewed and approved in a prior transmittal, will be returned with action "E. Engineer's Review Not Required."

END OF SECTION

Shop Drawing Transmittal

Project Name:			Transmittal No.:	
Project Location:			Date Received:	
To: NCS Engineers 202 E. Earll Drive, Suite 110 Phoenix, AZ 85012		From:	NCS Job No.:	
			Reviewed By:	
			Date Reviewed:	
Attn:		Attn:	Spec. Section:	
Date Transmitted:		Previous Transmittal Date:		1st. Sub. <input type="checkbox"/>
				ReSub. <input type="checkbox"/>
No. Copies	Description	Manufacturer	Drawing or Data No.	Action Taken*

Submitter's Remarks:

* The action Designated Above is in Accordance with the Following Legend:

- | | |
|---|---|
| <p>A - No Exceptions Taken</p> <p>B - Furnish as Noted</p> <p>C - Revise and Submitt</p> <ol style="list-style-type: none"> 1. Not enough information for review. 2. No reproducibles submitted. 3. Copies illegible 4. Not enough copies submitted. 5. Wrong sequence number. 6. Wrong resubmittal suffix. 7. Wrong specification section. 8. Wrong form used. 9. See comments. | <p>D - Rejected</p> <p>E - Engineer's review not required.</p> <ol style="list-style-type: none"> 1. Submittal not required. 2. Supplemental information. Submittal retained for informational purposes only. 3. Information reviewed and approved on prior submittal. 4. See comments. |
|---|---|

Reviewer's Comments:

Returned by (NCS) : _____ Date: _____

Distribution: Sub Consultant 1: ___ Copies OWNER: ___ Copies

NCS: ___ Copies

SECTION 01350

SPECIAL PROCEDURES

PART 1 GENERAL

1.01 CONCEALED EXISTING FACILITIES

- A. Verify locations of utilities and facilities which may exist by consulting with OWNER, utility companies, and “Call Arizona 811”, Phone No. 811, before you dig:
 - 1. Abide by easement and right-of-way restrictions.
- B. Notify owners of facilities when the Work will be in progress. Make arrangements for potential emergency repairs in accordance with requirements of Owners of facilities including individual or residential facilities.
- C. Assume responsibility for repair of facilities damaged by performance of the Work.
- D. Expose sanitary and storm sewers, water, gas, electric, telephone utility lines, and other underground facilities indicated to permit survey of location and elevation prior to commencement of Work in affected area.
- E. Expose in ample time to permit relocation of interfering utilities with minimum delaying effect on contract time.
- F. Work required for raising, lowering, or relocating utilities in right of way not indicated will be performed by affected utility owners or as part of the Work at option of affected owners of utilities and OWNER.

1.02 PROTECTION OF THE WORK AND PROPERTY

- A. CONTRACTOR shall assume responsibility for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage.
- B. In order to prevent damage, injury or loss, CONTRACTOR’S actions shall include, but not be limited to the following:
 - 1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
 - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.

3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
 4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by CONTRACTOR's operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy privately owned land with personnel, tools, materials or equipment, except on easements provided herein.
- D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.
- E. Underground Structures:
1. Underground structures are defined to include, but are not limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
 2. All underground structures known to ENGINEER, except water, gas, sewer, electric, and telephone service connections, are shown on Drawings. This information is shown for the assistance of CONTRACTOR, in accordance with the best information available, but is not guaranteed to be correct or complete.
 3. CONTRACTOR shall explore ahead of trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If CONTRACTOR damages an underground structure, restore it to original condition at his expense.
 4. Necessary changes in the location of the Work may be made by the OWNER to avoid unanticipated underground structures.
 5. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, OWNER will direct CONTRACTOR, in writing, to perform the Work, which shall be paid for under the provisions of the General Conditions.

- F. Surface Structures: Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, roads, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.
- G. Protection of Underground and Surface Structures:
1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the OWNER that the methods and procedures to be used have been approved by the party owning same.
 2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the OWNER of the damaged structure.
- H. All other existing surface facilities, including but not limited to guard rails, posts, guard cables, signs, poles, markers, and curbs, which are temporarily removed to facilitate installation of the Work, shall be replaced and restored to their original condition at CONTRACTOR's expense.

1.03 DAILY WORK REPORTS

- A. CONTRACTOR shall provide to OWNER and ENGINEER one copy of his daily field report indicating work completed, number and classification of personnel on site, number and types of construction equipment on site and weather conditions. The field reports shall be in pdf format and shall be submitted on Monday for the prior week.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01423

REFERENCE STANDARDS

PART 1 GENERAL

1.01 SUMMARY

- A. When a reference standard is specified, comply with requirements and recommendations stated in that standard, except when they are modified by the Contract Documents, or when applicable laws, ordinances, rules, regulations or codes establish stricter standards. The latest provisions of applicable standards shall apply to the Work, unless otherwise specified. Reference standards include, but are not necessarily limited to, the following:
1. American Concrete Institute (ACI).
 2. American Institute of Steel Construction (AISC).
 3. American National Standards Institute (ANSI).
 4. American Society for Testing and Materials (ASTM).
 5. American Water Works Association (AWWA).
 6. American Welding Society (AWS).
 7. Concrete Reinforcing Steel Institute (CRSI)
 8. Factory Mutual (FM).
 9. Occupational Safety and Health Administration (OSHA).
 10. Underwriters' Laboratories, Inc. (UL).
 11. All other applicable standards listed in the Specifications and the standards of utility service companies, where applicable.
 12. NSF International (NSF).
 13. State Division of Industrial Safety (DIS)
 14. National Association of Corrosion Engineers (NACE)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01450

MEASUREMENTS AND PAYMENTS

PART 1 GENERAL

1.01 SCOPE

A. Section Includes:

1. The methods by which measurement will be made of the quantities for which payment will be made for the project. It is the intention of this Specification that payment will be made for those items listed in the Price Sheet only. All items of work not specifically listed in the Price Sheet shall be included in the prices for the various items listed on the Price Sheet.
2. In computing quantities, the length, area, solid contents, number, weight, or time as specified in the Contract or the Price Sheet must be used.

B Related Sections

1. 01030 – Summary of Work.
2. 01060 – Special Conditions.
3. 02250 – Ground Surface Restoration.
4. 09800 – Special Coatings.
5. 13208 – Miscellaneous Work Associated with Welded Steel Storage Reservoir.
6. 15115 – Gate Valves and Appurtenances.

PART 2 PRODUCTS

A. Materials

1. Partial payment shall be made for approved materials stored at the project site at the submission of the material invoices.

PART 3 EXECUTION

A. The following section describes the measurements and payments of the Work performed in this Contract:

1. Reservoir Coating and Miscellaneous Improvements: The replacement of the existing reservoir 24"x24" roof hatch, improvements of the existing reservoir interior ladder, installation of the new ventilation manway and other miscellaneous reservoir improvements shall be performed in accordance with the Drawings and Specification Section 13208. After completing reservoir improvements, the entire reservoir interior surface

shall be blasted and coated, and the reservoir exterior surface shall be pressure washed and overcoated per Specification Section 09800. ENGINEER will inspect the progress of the Work and will measure the quantity of the Work performed in comparison with the total Work. ENGINEER will approve payments only on the portion of the Work performed.

2. Removal and Replacement of 24-inch Gate Valve: The existing 24-inch valve on the reservoir fill line shall be removed and replaced with new 24-inch gate valve in accordance with the Drawings and Specification Section 15115. Measurement for this item shall be based on complete installation of the gate valve including restoration of disturbed ground and is ready for continuous operation. Payment for replacement of the gate valve shall be made at the lump sum price as submitted on the Price Sheet.
3. Ground Surface Restoration: The existing ground areas disturbed during construction shall be restored by providing and installing decomposed granite (DG) per Specification Section 02250. Measurement for the DG material shall be made for the actual quantity required to cover the disturbed areas in tons. Payment for the ground restoration shall be made for the quantities approved by the ENGINEER at the unit price per ton as submitted on the Price Sheet.
4. Removal and Replacement of Outer Rafter: The existing reservoir outer roof rafters shall be removed and replaced in accordance with the Drawings and Specification Section 13208. ENGINEER will field identify and authorize the quantity of the outer rafters that need to be replaced. Measurement for removal and replacement of outer rafters shall be made per actual number of rafters satisfactorily removed and replaced. Payment for the removal and replacement of outer rafter shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.
5. Removal and Replacement of Inner Rafter: The existing reservoir inner roof rafters shall be removed and replaced in accordance with the Drawings and Specification Section 13208. ENGINEER will field identify and authorize the quantity of the inner rafters that need to be replaced. Measurement for removal and replacement of inner rafters shall be made per actual number of rafters satisfactorily removed and replaced. Payment for the removal and replacement of inner rafter shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.
6. Floor Weld Plates: Deep pits (pits greater than 1/8-inch depth) on the reservoir floor shall be covered by welding 4-inch diameter and 1/4-inch thick steel plates per Specification Section 13208. ENGINEER will field identify deep pit locations and authorize the quantity of the weld plates that need to cover deep pits. Measurement for floor weld plates shall be made per actual number of weld plates installed. Payment for the floor weld plates shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.

7. 2 Man Weld Crew Hours to Grind Reservoir Interior Weld Seams: Welding spatter and sharp edges on the reservoir interior shell and floor plates weld seams shall be grinded per Specification Section 13208. ENGINEER will field determine and authorize quantity of 2-man weld crew hours for completing this task. Measurement for the reservoir interior weld seams' grinding shall be made per actual number of 2-man weld crew hours spent in grinding the weld seams. Payment for the reservoir interior weld seams' grinding shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.
8. Removal and Replacement of Tie Rods: The existing reservoir outer rafter tie rods shall be removed and replaced in accordance with the Drawings and Specification Section 13208. ENGINEER will field identify and authorize the quantity of the tie rods that need to be replaced. Measurement for the removal and replacement of tie rods shall be made per actual number of tie rods satisfactorily removed and replaced. Payment for the removal and replacement of tie rods shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.
9. Removal and Replacement of Rafter Clips: The existing reservoir rafter clips shall be removed and replaced in accordance with the Drawings and Specification Section 13208. ENGINEER will field identify and authorize the quantity of the rafter clips that need to be replaced. Measurement for the removal and replacement of rafter clips shall be made per actual number of rafter clips satisfactorily removed and replaced. Payment for the removal and replacement of rafter clips shall be made based on the authorized quantity at the unit price as submitted on the Price Sheet.
10. Dehumidification and Ventilation System: Provide and operate dehumidification and ventilation system per Specification Section 09800. Measurement for the dehumidification and ventilation system shall be made on mobilization, fuel, weeks of actual on-site satisfactory operation, and demobilization of the system. Payment for the dehumidification and ventilation system shall be based on the City approved time and material invoices provided by the Contractor and shall be considered as full compensation for this Work item. No work shall be performed under this item unless it is authorized, in writing, by the City or authorized representative. The Contractor shall be allowed 10% markup. The Price Sheet includes an Allowance for this item.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Furnishing, maintaining, and removing construction facilities including temporary utilities, construction aids, barriers and enclosures, security, and removal after construction.
 - 1. Requirements are of concern to OWNER and are representative of construction facilities and controls which are solely CONTRACTOR's responsibility.
 - 2. No attempt is made to set out in detail means or methods necessary to satisfy requirements:
 - a. Recognition of requirements is made to assist CONTRACTOR in the identification of necessary costs.

1.02 TEMPORARY UTILITIES

- A. Temporary Electrical Power:
 - 1. CONTRACTOR is responsible for all costs of wiring, connections, and interface with local power company for temporary power supply during construction or provide his own generators.
 - 2. One 120V power outlet is available at the project site. CONTRACTOR can use it for operating small tools at no extra cost.
- B. Temporary Electrical Lighting:
 - 1. In work areas, provide temporary lighting sufficient to maintain lighting levels during working hours not less than lighting levels required by OSHA and state agency which administers OSHA regulations where Project is located.
- C. Temporary Heating, Cooling, and Ventilating:
 - 1. Heat and ventilate work areas to protect the Work from damage by freezing, high temperatures, weather, and to provide safe environment for workers.
- D. Temporary Water:
 - 1. See Section 13208.
 - 2. CONTRACTOR may use limited amount of water from OWNER at no cost. Provide approved method of backflow prevention device.
- E. Temporary Fire Protection: Provide sufficient number of fire extinguishers of type and capacity required to protect the Work and ancillary facilities.

- F. First Aid: Post first aid facilities and information posters conforming to requirements of OSHA and other applicable Laws and Regulations in readily accessible locations.
- G. Temporary Sanitary Facilities:
 - 1. Provide temporary sanitary facilities for the needs of all employees and workers at the site.
 - 2. Provide suitable and adequate sanitary facilities that are in compliance with applicable Laws and Regulations.
 - 3. At completion of the Work, remove sanitary facilities and leave site in neat and sanitary condition.

1.03 CONSTRUCTION AIDS

- A. General:
 - 1. Use construction hoists, elevators, scaffolds, stages, shoring and similar temporary facilities of ample size and capacity to adequately support and move loads.
 - 2. Provide railings, kick plates, enclosures, safety devices, and controls required by Laws and Regulations and as required for adequate protection of life and property.
 - 3. Design temporary supports with adequate safety factor to assure adequate load bearing capability:
 - a. When requested, submit design calculations by professional registered engineer prior to application of loads.
 - 4. Submitted design calculations are for information and record purposes only.
- B. Accident Prevention:
 - 1. Exercise precautions throughout construction for protection of persons and property.
 - 2. Observe safety provisions of applicable Laws and Regulations.
 - 3. Guard machinery and equipment, and eliminate other hazards.
 - 4. Make reports required by authorities having jurisdiction, and permit safety inspections of the Work.
 - 5. Before commencing construction Work, take necessary action to comply with provisions for safety and accident prevention.
- C. Barricades:
 - 1. Place barriers at ends of excavations and along excavations to warn pedestrian and vehicular traffic of excavations.
 - 2. Provide barriers with flashing lights after dark.
 - 3. Keep barriers in place until excavations are entirely backfilled and compacted.
 - 4. Barricade excavations to prevent persons from entering excavated areas in streets, roadways, parking lots, other public or private areas, and on project site.

- D. Warning Devices and Barricades: Adequately identify and guard hazardous areas and conditions by visual warning devices and, where necessary, physical barriers.
 - 1. Devices shall conform to minimum requirements of OSHA and State agency which administers OSHA regulations where Project is located.
- E. Hazards in Public Right-of-Way:
 - 1. Mark at reasonable intervals, trenches and other continuous excavations in public right-of-way, running parallel to general flow of traffic, with traffic cones, barricades, or other suitable visual markers during daylight hours:
 - a. During hours of darkness, provide markers with torches, flashers, or other adequate lights.
 - 2. At intersections or for pits and similar excavations, where traffic may reasonably be expected to approach head on, protect excavations by continuous barricades:
 - a. During hours of darkness, provide warning lights at close intervals.
- F. Hazards in Protected Areas: Mark or guard excavations in areas from which public is excluded, in manner appropriate for hazard.
- G. Above Grade Protection: On multi-level structures, provide safety protection that meets requirements of OSHA and State agency which administers OSHA regulations where Project is located.
- H. Protect existing structures, trees, shrubs, and other items to be preserved from injury, damage or destruction by vehicles, equipment, workers or other agents with substantial barricades or other devices commensurate with hazards.

1.04 REMOVAL

- A. Remove temporary buildings and furnishings before inspection for Final Completion or when directed.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Remove underground installations to minimum depth of 24 inches and grade to match surrounding conditions, unless noted otherwise.
- D. Restore existing facilities used during construction to specified or original condition.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01560

ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. The CONTRACTOR shall perform all work in such manner as to minimize the polluting of air, water, or land, and shall, within reasonable limits, control noise and the storage of solid waste materials.

1.02 QUALITY ASSURANCE

- A. Employ and utilize environmental protection methods, and obtain all necessary permits required at the site for air quality, solid waste, storm water pollution, and hazardous wastes. CONTRACTOR shall comply with all state, county, and Federal regulations.

1.03 SUBMITTALS

- A. See Section 01340.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 ERECTION AND INSTALLATION

- A. Land Protection:
 - 1. Manage and control all work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to site of work.
 - 2. Restore all disturbed areas including haul areas and establish permanent type of locally adaptable vegetative cover.
- B. Control of Responsibilities:
 - 1. Collect and dispose of solid waste on a daily basis.
 - 2. Provide disposal of degradable debris to an approved solid waste disposal site.
 - 3. Provide disposal of nondegradable debris to an approved solid waste disposal site or in an alternate manner approved by OWNER and regulatory agencies.
 - 4. Store chemical wastes in watertight containers and remove from project site and dispose of to sites approved by regulatory agencies. Assure maximum disposal frequency of one month.
 - 5. Control dust at all times, including nonworking hours, weekends and

holidays. Sprinkle site or treat with dust suppressors as necessary to control dust. Utilize methods and practices of construction to eliminate dust in full observance of regulatory agencies.

6. Minimize noise by fitting equipment with appropriate mufflers. The use of explosives or blasting operations are not approved.
7. On completion of work, leave area in a clean condition representative of current conditions. Assure all signs of temporary construction and activities incidental to construction of required permanent work in place are obliterated.

END OF SECTION

SECTION 01600

PRODUCT DELIVERY, STORAGE AND HANDLING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Scheduling of product delivery.
 - 2. Packaging of products for delivery.
 - 3. Protection of products against damage from:
 - a. Handling.
 - b. Exposure to elements or harsh environments.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 1 - General Requirements.
- C. Payment:
 - 1. No payment will be made to CONTRACTOR for equipment not properly stored and insured.
 - 2. Previous payments for items will be deducted from subsequent progress estimate(s) if proper storage procedures are not observed.

1.02 QUALITY ASSURANCE

- A. Manufacturer's written directions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. Scheduling:
 - 1. Schedule delivery of products or equipment as required to allow timely installation and to avoid prolonged storage.
- B. Packaging:
 - 1. Deliver products or equipment in manufacturer's original unbroken cartons or other containers, clearly and fully marked and identified as to manufacturer, item, installation location and instructions for assembly, use and storage.
- C. Protection:
 - 1. Protect all materials in accordance with manufacturer's written directions:
 - a. Store products or equipment in location to avoid physical damage to items while in storage.

- b. Handle products or equipment in accordance with manufacturer's recommendations and instructions.
2. Protect equipment from exposure to elements and keep thoroughly dry. Store pumps, motors, electrical equipment, and other equipment having antifriction or sleeve bearings in a weathertight warehouses which are maintained at a temperature of at least 60 deg. F.
3. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Repaint damaged painted surfaces to satisfaction of OWNER.
4. Protect electrical equipment, controls, and insulation against moisture or water damage.

3.02 FIELD QUALITY CONTROL

- A. Inspect all products or equipment delivered to the site prior to unloading and reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on Project.
- B. Continually monitor storage area to ensure suitable temperature and moisture controls are maintained.

END OF SECTION

SECTION 01610

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Description of applicable codes, ordinances, and regulations.

1.02 CODES AND ORDINANCES

- A. Applicable Codes: Compliance with all laws, ordinances, and regulations of authorities having jurisdiction is an integral requirement of the Contract Documents, whether each code is mentioned or not in the Contract documents.
- B. Compliance: Comply with all applicable codes, ordinances and regulations in effect at the time of bid opening, including but not necessarily limited to the following:
1. State and Federal Safety and Health Laws.
 2. Clean Water Act compliance for storm water and potable water discharges.
 3. NSF International Standards 60 and 61.
- C. Detailed Requirements: Be familiar with and verify detailed requirements of applicable codes to verify that items and their installation provided under Work of this Contract meet or exceed legal requirements.
1. Discrepancies: If discrepancies occur between the Contract Documents, local codes, local utility requirements, etc., most stringent requirements shall apply.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01651

TRANSPORTATION AND HANDLING OF MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 DESCRIPTION

- A. CONTRACTOR shall make all arrangements for transportation, delivery and handling of equipment and materials required for prosecution and completion of the Work.
- B. Shipments of materials to CONTRACTOR or subcontractors shall be delivered to the site only during regular working hours. Shipments shall be addressed and consigned to the proper party giving name of Project, street number and city. Shipments shall not be delivered to OWNER, except where otherwise directed.
- C. If necessary to move stored materials and equipment during construction, CONTRACTOR shall move materials and equipment without any additional compensation.

1.02 PREPARATION FOR SHIPMENT

- A. When practical, factory assemble products. Matchmark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with a strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, OWNER'S contract name and number, CONTRACTOR, equipment number, and approximate weight. Include complete packing lists and bills of materials with each shipment.
- C. Protect products from exposure to the elements and keep thoroughly dry and dust free at all times. Protect painted surfaces against impact, abrasion, discoloration, or other damage. Grease or oil all bearings and similar items.
- D. Do not have products shipped until:
 - 1. Related Shop Drawings have been approved by ENGINEER.
 - 2. Related factory test results, required in the individual Specification Sections, have been reviewed and accepted by ENGINEER.
 - 3. Required storage facilities have been provided.

1.03 DELIVERY

- A. CONTRACTOR shall arrange, with the United States Postal Service, a special address for the Project, if needed. All deliveries shall be made to that address.
- B. Arrange deliveries of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.
- C. Coordinate deliveries to avoid conflict with Work and conditions on site and to accommodate the following:
 - 1. Work of other contractors, or OWNER.
 - 2. Limitations of storage space.
 - 3. Availability of equipment and personnel for handling products.
 - 4. OWNER'S use of premises.
- D. Have products delivered to site in manufacturer's original, unopened, labeled containers. Keep ENGINEER informed of delivery of all equipment to be incorporated in the Work.
- E. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts and to facilitate assembly.
- F. Immediately on delivery, inspect shipment to assure:
 - 1. Product complies with requirements of Contract Documents and reviewed submittal.
 - 2. Quantities are correct.
 - 3. Containers and packages are intact, and labels are legible.
 - 4. Products are properly protected and undamaged.
- G. Promptly remove damaged products from the Project site and expedite delivery of new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.04 PRODUCT HANDLING

- A. Provide equipment and personnel necessary to handle products, including those provided by OWNER, by methods to prevent soiling or damage to products or packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.
- C. Handle products by methods to prevent bending or overstressing.
- D. Lift heavy components only at designated lifting points.

- E. Materials and equipment shall at all times be handled in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them. Do not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Contract closeout requirements including:
 - 1. Final cleaning.
 - 2. Disinfection of systems.
 - 3. Preparation and submittal of closeout documents.
 - 4. Final completion certification.

1.02 FINAL CLEANING

- A. Perform final cleaning prior to inspections for acceptance of the Work:
 - 1. Clean grease, mastic, adhesives, dust, dirt, stains, fingerprints, paint, blemishes, sealants, plaster, concrete, and other foreign materials from sight-exposed surfaces, and fixtures and equipment.
 - 2. Remove non-permanent protection and labels.
 - 3. Clean light fixtures and replace burned-out or dim lamps.

1.03 WASTE DISPOSAL

- A. Arrange for and dispose of surplus materials, waste products, and debris off-site.
- B. Do not create unsightly or unsanitary nuisances during disposal operations.

1.04 TOUCH-UP AND REPAIR

- A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for acceptance of the Work.
- B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

1.05 CLOSEOUT DOCUMENTS

- A. Submit following Closeout Submittals upon completion of the Work and at least 7 days prior to submitting Application for Final Payment:
 - 1. Evidence of compliance with requirements of governing authorities.
 - 2. Project Record Documents.
 - 3. Warranties and Bonds.

4. Evidence of Payment and Release of Liens as outlined in Conditions of the Contract.
5. Release of claims as outlined in Conditions of the Contract.
6. Red-Line as-builts.

1.06 EVIDENCE OF COMPLIANCE WITH REQUIREMENTS OF GOVERNING AUTHORITIES

- A. Submit the following:
1. Certificate of Inspection as required.
 2. Certificate of Occupancy will not be required.

1.07 WARRANTIES AND BONDS

- A. Provide executed Warranty or Guaranty Form if required by Contract Documents.
- B. Provide specified additional warranties, guarantees, and bonds from manufacturers and suppliers.

PART 2 PRODUCTS (**NOT USED**)

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2
SITE WORK

SECTION 02250

GROUND SURFACE RESTORATION

PART 1 GENERAL

1.01 SCOPE

- A. General work included in this Section:
 - 1. Restoration of all disturbed areas during construction.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 1.
- C. Location of Work: All areas within the project site which are disturbed in the course of the Work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Decomposed Granite (DG)
 - 1. Provide decomposed granite in accordance with the Maricopa Association of Governments (MAG) Standard Specification Section 795 - Landscape Material.

2.02 TOLERANCES

- A. Finish Grading Tolerance: 0.1 ft plus/minus from the existing surface elevations.

PART 3 EXECUTION

3.01 RESTORATION

- A. CONTRACTOR shall rough grade and finish grade the areas disturbed by the CONTRACTOR during the course of performing Work. This task shall be performed as part of Bid Item No. 1.
- B. Furnish and apply a 2 in. layer of DG over the prepared areas.
- C. Confirm color with OWNER.

END OF SECTION

DIVISION 9
FINISHES

SECTION 09800

SPECIAL COATINGS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Field applied high performance coatings. All exposed surfaces of equipment, piping, supports, and reservoir interior and exterior surfaces shall be field finished, unless specifically stated otherwise.
- B. Related Sections:
 - 1. Section 13208 - Miscellaneous Work Associated with Welded Steel Storage Reservoirs.
- C. See Drawings.

1.02 REFERENCES

- A. NSF International (NSF):
 - 1. 61 - Drinking Water System Components - Health Effects.
- B. American National Standards Institute (ANSI):
 - 1. A159.1 - Surface Preparation Specifications.
- C. American Society for Testing and Materials (ASTM):
 - 1. D 16 - Terminology Relating for Paint, Related Coatings, Materials, and Applications.
 - 2. D 4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel.
 - 3. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. American Water Works Association (AWWA):
 - 1. C652 Disinfection of Water Storage Facilities
 - 2. D102, Coating Steel Water-Storage Tanks
- E. The Society for Protective Coatings (SSPC):
 - 1. SP 1 - Solvent Cleaning.
 - 2. SP 2 - Hand Tool Cleaning.
 - 3. SP 3 - Power Tool Cleaning.
 - 4. SP 6 - Commercial Blast Cleaning.
 - 5. SP 10 - Near White Metal Blast Cleaning.
 - 6. SP 11 - Power Tool Cleaning to Bare Metal.

7. Steel Structures Painting Manual, Volumes 1 and 2.
 8. VIS 1 - Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.
 9. VIS 3 - Guide and Reference Photographs for Steel Surfaces Prepared by Hand and Power Tool Cleaning.
 10. PA1 - Shop, Field, and Maintenance Painting of Steel, latest revision.
 11. PA2 Level 3- Procedure for Determining Conformance to Dry Coating Thickness Requirements.
 12. PA10-Guide to Safety and Health Requirements.
 13. Guide 6-Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations.
 14. Guide 12-Guide for Illumination of Industrial Painting Projects.
- F. National Association of Corrosion Engineers (NACE International)
1. SP0188-Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
 2. Publication 6D-173-A Manual for Painter Safety.

1.03 DEFINITIONS

- A. Submerged Metal: Steel or iron surfaces below tops of channel or structure walls which will contain water even when above expected water level.
- B. Dry Film Thickness (DFT): Thickness of fully cured coating, measured in mils (1/1000 inch).
- C. Volatile Organic Compound (VOC): Content of air polluting hydrocarbons in uncured coating products measured in units of grams per liter or pounds per gallon.
- D. Rust Spot: Rusted surface with area smaller than 0.05 SQ.FT.
- E. Installer or Applicator: Installer or applicator is the person actually installing or applying the product in the field at the Project site. Installer or applicator are synonymous. Installer or Applicator may be the CONTRACTOR.
- F. Inaccessible Areas: Areas of the finished structure that, by virtue of the configuration of the completed structure, cannot be accessed to perform surface preparation or coating application (with or without the use of scaffolding, rigging, or staging). Inaccessible areas include such areas as the contact surfaces of roof plate lap joints, underside of roof plates where they cross supporting members, top surface of rafters directly supporting roof plates, contact surfaces of bolted connections, underside of column base plates, contact surfaces of mating parts not intended to be removed or disassembled during routine operation or maintenance of the tank, and underside of the tank bottom for ground-supported flat-bottom reservoirs.

- G. Holiday: A void, crack, thin spot, foreign inclusion, or contamination in the coating film that significantly lowers the dielectric strength of the coating. May also be identified as a pinhole.
- H. The term “coating” and “lining” as used herein are considered interchangeable and mean coating systems materials, including any applicable resinous primers and finish coats that function to provide protection of steel substrates.
- I. Touch-Up Coating: The application of a coating on areas of coated surfaces to repair marks, scratches, and areas where the coating has deteriorated to restore the coating film to an unbroken condition.
- J. Shop Coat: One or more coats applied in a shop or plant prior to shipment to the site, where the field or finishing coat is applied.
- K. Wet Film Thickness (WFT): Thickness of wet coating measured in mils.

1.04 PERFORMANCE REQUIREMENTS

- A. Coating materials for metal surfaces shall be especially adapted for use in potable water storage reservoirs.
- B. Coating materials that come into contact with potable water shall be certified to NSF Standard 61.

1.05 SUBMITTALS

- A. Product Data: Submit in accordance with Sections 01340. Include description of physical properties of coatings including solids content and ingredient analysis, VOC content, temperature resistance, typical exposures and limitations, and manufacturer’s standard color chips.
- B. Certificates: Submit in accordance with requirements for Product Data.
- C. Manufacturer’s Instructions: Submit in accordance with requirements for Product Data. Include:
 1. Special requirements for transportation and storage.
 2. Mixing instructions.
 3. Shelf life.
 4. Pot life of material.
 5. Precautions for applications free of defects.
 6. Surface preparation.
 7. Method of application.
 8. Recommended number of coats.
 9. Recommended thickness of each coat.
 10. Recommended total thickness.

11. Drying time of each coat, including prime coat.
 12. Required prime coat.
 13. Compatible and non-compatible prime coats.
 14. Recommended thinners, when recommended.
 15. Limits of ambient conditions during and after application.
 16. Time allowed between coats.
 17. Required protection from sun, wind and other conditions.
 18. Touch-up requirements and limitations.
 19. Material Safety Data Sheet.
- D. Certified statement on lead free coatings for interior of water storage reservoirs.
- E. Certification: Certify that applicable pigments meet the specifications.

1.06 QUALITY ASSURANCE

- A. Qualifications of CONTRACTOR and Applicator:
1. All work of this Contract shall be done in a workmanlike manner, by skilled personnel experienced in the particular type of work being performed. The coating shall be performed in a manner satisfactory to the ENGINEER and using approved methods, acceptable tools and practices.
 2. CONTRACTOR is completely responsible to insure that applicator personnel are completely trained and experienced in the proper use of all specified/submitted coating and lining materials, surface preparation and application equipment being used for the project.
- B. Regulatory Requirements: Comply with requirements regarding the following:
1. Volatile organic compound limitations.
 2. Coatings containing lead compounds.
 3. NSF certification of coatings for use in potable water supply systems.
- C. Compatibility of Coatings: Use products by same manufacturer for prime coats, intermediate coats, and finish coats on same surface, unless specified otherwise.
- D. If any requirements of this specification conflict with a referenced standard, the more stringent requirement shall apply.
- E. Do not use or retain contaminated, outdated, or diluted materials for coating operations. Do not use materials from previously opened containers.
- F. Use only products of the approved manufacturer. Use products of one manufacturer in any one resurfacing system with compatible materials. Provide same material product for touch up as for original material.
- G. Make available all locations and phases of the work for access by the ENGINEER or other personnel designated by the ENGINEER. The CONTRACTOR shall

provide ventilation and egress to safely access the coating work areas for inspection.

H. Pre-Application Meetings:

1. Pre-application meetings shall take place at the job-site a minimum 1 week before the application of any coating or lining work proceeding. Attendance is required of all principal decision making parties directly affecting work of this Section, including CONTRACTOR, ENGINEER, OWNER, Trades Persons of other work in and around the coatings work, Coating Applicator, Coating Manufacturer's Technical Representative, and ENGINEER'S Coating Inspector.

I. Coating Application Log:

1. Coating Application Log shall be maintained on a daily basis for all areas where the Work is being performed. The Paint Application Log shall be turned over to the ENGINEER by 9:00 a.m. on the day following the day that the work was performed. The log shall include the following:
 - a. Date.
 - b. Time.
 - c. Weather condition (at work location).
 - d. Air temperature (at work location).
 - e. Surface temperature (at work location).
 - f. Dew point (at work location).
 - g. Humidity (at work location).
 - h. Wind direction, wind speed, and surface temperature a minimum of three (3) times per day for each day the CONTRACTOR is on site completing the work. The CONTRACTOR shall also record the interior metal surface temperatures on sides of reservoirs that are shaded and not shaded from the sun.
 - i. Material temperature Before (Separately) and Mixed (Combined).
 - j. Location/area square footage of area coated.
 - k. Description of work performed.
 - l. Materials used, colors and batch numbers, quantity of materials used (not including waste).
 - m. Application/surface preparation equipment and personnel.
 - n. WFT/surface profile measurements.
 - o. Comments, quality control procedures.
 - p. Signature/title.

1.07 PROJECT CONDITIONS

- A. Proceed with surface preparation and coating application only when air and surface temperatures are above the manufacturers' recommended minimum surface temperature and below 100 degrees Fahrenheit, and surface temperature is at least 5 degrees above dew point air temperature reading. Coating shall not be applied to dusty, wet, or damp surfaces, and shall not be applied in rain, snow, fog

or mist, or when relative humidity exceeds 85 percent. No coating shall be applied when it is expected that the relative humidity will exceed 85 percent or when the air temperature will drop below 40 degrees Fahrenheit within 8 hours after the application of the coating. If working conditions are questionable, the ENGINEER shall make the decision and the CONTRACTOR shall accept ENGINEER'S interpretation as final and binding.

- B. Provide adequate continuous ventilation and sufficient heating facilities to maintain minimum 45 degrees Fahrenheit for 48 hours before, during, and 72 hours after application of finishes.
- C. No surface preparation or coating application work shall be done under unfavorable weather conditions, unless the work is adequately protected, and then only with the specific approval of the ENGINEER and inspection.
- D. Before coating is started in any area, all surfaces to be coated and floors shall be cleaned of all dust using commercial vacuum cleaning equipment equipped with high-efficiency particulate air filters (HEPA filters) and dust containment systems. Just blowing down surface is not acceptable.
- E. Apply coatings to dust free surfaces. To test surfaces, apply strip of clear adhesive tape provided in OTB-SCATT test kit to surface and rub onto surface with finger or supplied roller. When removed, compare the tape to the supplied OTB-SCATT SC PERCENTAGES chart. Visual observations (without magnification) should show a rating of SC-1(1%) or less, i.e. little or no dust, blast abrasive, or other contaminant. Attach tape test strip to the middle rating sheet. Reject contaminated surfaces, clean by vacuum cleaning, and retest. Randomly test surfaces at rate of 8 tests for the first 1000 square feet. Afterwards conduct one test for each additional 1000 square feet. Provide two additional tests for each failed test or questionable test. Submit test tapes results with Daily Inspection Reports. OTB-SCATT can be obtained at OTB Technologies Inc. 5401 E. BeckLane Scottsdale, AZ 85254 or www.OTBTECH.NET, or approved equal.
- F. Provide lighting for all work areas as prescribed in SSPC Guide 12.

1.08 MAINTENANCE

- A. Extra Materials: Provide minimum 1 gallon of each type and color of coating applied.
 - 1. When manufacturer packages material in gallon cans, deliver unopened labeled cans as comes from factory.
 - 2. When manufacturer does not package material in gallon cans, deliver material in new gallon containers, properly sealed and identified with typed labels indicating brand, type, and color.

1.09 PRODUCTS DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products in accordance with Section 01651.
- B. Remove unspecified and unapproved paints from Project site immediately.
- C. Deliver containers with labels identifying the manufacturer's name, brand name, product type, batch number, date of manufacturer, expiration date or shelf life, color, and mixing and reducing instructions.
- D. Store coatings in well ventilated facility that provides protection from the sun weather, and fire hazards. Maintain ambient storage temperature between 45 and 90 degrees Fahrenheit, unless otherwise recommended by the manufacturer.
- E. Take precautions to prevent fire and spontaneous combustion.

1.10 PROTECTION

- A. During application of exterior coating of reservoir, the CONTRACTOR shall take any and all necessary precautions to avoid coating fallout on and the consequent damage to any works, improvements or properties either of the OWNER or of other parties, wherever located. The CONTRACTOR shall be responsible for all damage resulting from the coating.
- B. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.
- C. Place cotton waste, cloths and material which may constitute fire hazard in closed metal containers and remove daily from site.
- D. Remove electrical plates, surface hardware, fittings and fastenings, prior to coating operations. Carefully store, clean and replace on completion of coating in each area. Do not use solvent or degreasers to clean hardware that may remove permanent lacquer finish.

1.11 ALLOWANCE ITEMS

- A. The CONTRACTOR shall perform the following Work on the reservoir if authorized by the OWNER.
 - 1. Dehumidification and Ventilation System (Allowance)
 - a. Provide and utilize dehumidification and ventilation equipment to control humidity, temperature, and vapor levels inside reservoir from beginning of the surface preparation process through coating application and curing. System shall maintain vapor concentrations at or below 10 percent of Lower Explosive Limit (LEL). System

may incorporate any combination of solid desiccant and direct expansion refrigeration equipment. No liquid, granular, calcium chloride or lithium chloride drying systems will be accepted. Use only electric, indirect fired combustion, indirect friction, or steam coil auxiliary heaters. System shall be compatible with removal of dust and solvent vapors, and shall have fail-safe measures to ensure reliability during operations.

- 1). Enclosures for other areas or items that may require protection from the inclement weather or other detrimental effects so the project can continue is the responsibility of the CONTRACTOR.
- b. Provide generator and fuel for operating the dehumidification and ventilation equipment. No electric service is available at the reservoir site to run the dehumidification and ventilation equipment.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Coating Systems - General:
 1. P = prime coat. I = intermediate coat. F1, F2,. . . Fn = first finish coat, second finish coat . . . nth finish coat, color as selected by OWNER. FnE = exterior finish nth coat.
 2. Coating thicknesses specified are minimum dry mil thicknesses.
- B. Coating Systems:
 1. System No. 1: Polyamide Epoxy - For exterior of reservoir new appurtenances. Items include but are not limited to new ventilation manway and roof hatch.
 - a. Following are acceptable Manufacturers and coating systems:
 - 1). Carboline Protective Coatings
 - 2). International Paint - Devoe
 - 3). Tnemec Coatings
 - 4). Or pre-approved equal

Carboline Epoxy/Urethane System

P1 = Carboguard 61 Epoxy, 1 Coat, 4-6 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

I = Carboguard 61 Epoxy, 1 Coat, 4-6 mils DFT.

F1E = Carbothane 133HB, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Devoe Epoxy/Urethane System

P1 = Devoe Bar-Rust 233H, 1 Coat, 4-6 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

I = Devoe Bar-Rust 233H, 1 Coat, 4-6 mils DFT.

F1E = Devthane 378H, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Tnemec Epoxy/Urethane System

P1 = Series 66 Hi-Build Epoxoline, 1 coat, 4-6 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

I1 = Series 66 Hi-Build Epoxoline, 1 coat, 4-6 mils DFT.

F1E = Series 1075U, 1 coat, 3-4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

2. System No. 2: 100% Solids Polyurethane (EPA/NSF) - For reservoir floor and interior shell surfaces. Items also include but are not limited to columns, column base assemblies, ladder, shell manways, discharge and drain piping, overflow weir boxes, and other reservoir interior appurtenances. The system shall conform to AWWA D102 Inside Coating System (ICS) No.4.

a. Following are acceptable Manufacturers and coating systems:

- 1). Carboline Protective Coatings
- 2). International Paint - Polibrid
- 3). Sherwin Williams
- 4). Or pre-approved equal

Carboline Polyurethane Hybrid

F1E = Reactamine 760, 1 Coat, 30-40 mils DFT, 100% Solids, Zero VOC

Polibrid Polyurethane

F1E = Polibrid 705, 1 Coat, 30-40 mils DFT, 100% Solids, Zero VOC

Sherwin Williams Polyurethane

F1E = SherFlex, 1 Coat, 30-40 mils DFT, 100% Solids, Zero VOC

3. System No. 3: Epoxy-Polyurethane: For overcoating reservoir exterior surface. Items include but are not limited to entire existing exterior reservoir surface, exterior ladders, railing, roof and shell manways/hatches, rust spots, conduits, and piping.

a. Following are acceptable Manufacturers and coating systems:

- 1). Carboline Protective Coatings
- 2). International Paint - Devoe
- 3). Tnemec Coatings
- 4). Or pre-approved equal

Carboline

Spot Prime = Carbomastic 615, 1 coat, 2-4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned. (for rust spots only)

F1E = Carbothane 133HB, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Devoe

Spot Prime = Bar-Rust 233H, 1 coat, 2-4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned. (for rust spots only)

F1E = Devthane 378H, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Tnemec

Spot Prime = Series 135 Chembuild, 1 coat, 2-4 mils DFT, maximum VOC = 3.5 LBS/GAL. (for rust spots only)

F1E = Series 1075U, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

- b. CONTRACTOR to apply minimum two test patches per reservoir, 1'-0"x1'-0" in size, of new coating system on the reservoir exterior surface to confirm the adhesion with the existing coating system. CONTRACTOR shall apply these test patches prior to reservoir interior surface preparation.
4. System No. 4: Polyamide Epoxy-Polyurethane: For exposed PVC and CPVC piping.
- a. Following are acceptable Manufacturers and coating systems:
 - 1). Carboline Protective Coatings
 - 2). International Paint - Devoe
 - 3). Tnemec Coatings
 - 4). Or pre-approved equal

Carboline

P1 = Carboguard 893 SG Epoxy, 1 coat, 4-6 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Carbothane 133HB, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Devoe

P1 = Bar-Rust 233H, 1 coat, 4-6 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Devthane 378H, 1 coat, 3- 4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Tnemec

P1 = Series N69 Hi-Build Epoxoline II, 1 coat, 3-4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Series 1075 Endura-Shield II, 1 coat, 3-4 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

5. System No. 5: Two Coat Epoxy (EPA/NSF) - For reservoir interior roof surface and column top plates. Items also include but are not limited to beams, rafters, bolted connections, roof vent, ventilation manway, roof hatches, dollar plate (center column top plate) and intermediate column top plates (both top and bottom sides).

a. Following are acceptable Manufacturers and coating systems:

- 1). Carboline Protective Coatings
- 2). International Paint - Devoe
- 3). Tnemec Coatings
- 4). Sherwin-Williams
- 5). Or pre-approved equal

Carboline

P1 = Carboguard 61, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Carboguard 61, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Devoe

P1 = Bar-Rust 233H, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Bar-Rust 233H, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Tnemec

P1 = Series N140, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Series N140, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

Sherwin-Williams

P1 = Macropoxy 646 PW, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

F1E = Macropoxy 646 PW, 1 coat, 6-8 mils DFT, maximum VOC = 3.5 LBS/GAL thinned.

C. Blast Abrasive:

1. Use proper equipment and abrasives when blast cleaning to produce the mil profile, within the range of 3.5 to 5.0 or as recommended by the coating manufacturer. Do not reuse abrasives.
2. CONTRACTOR shall use only garnet for blasting purposes. The garnet abrasive used shall be of the type that is graded as to proper size, shape and hardness. It shall be free of contaminants and shall not embed itself in the blasted surface. Garnet type abrasives shall be chemically washed, dried, dust, dirt and fines free, resistant to fracture (shattering), and

contain no leachable contaminants. The use of reduced or dust free abrasive blasting is required. Prior to mobilization to the field, samples of the CONTRACTOR's selected abrasive and/or abrasive/admixture shall be submitted to the ENGINEER for testing and review. Random field testing of the abrasive shall be done by the CONTRACTOR, as directed by the ENGINEER to ensure the abrasive used complies with these requirements.

PART 3 EXECUTION

3.01 GENERAL PREPARATION

- A. Prepare surfaces in accordance with coating manufacturer's instructions, unless more stringent requirements follow.
- B. Protect following surfaces from abrasive blasting in accordance with Paragraph 1.10, by masking, or other means:
 - 1. Surfaces to be assembled against gaskets.
- C. Protect installed equipment, and adjacent coated equipment from abrasive blasting to prevent damage caused by entering sand or dust.
- D. Reservoir Exterior Surface:
 - 1. Unless specified otherwise, the reservoir exterior surface shall be pressure washed (minimum 3,500psi with rotating tip) and wiped with mop to remove all chalk, dirt, debris and contaminants followed by SSPC SP-3 Power Tool Cleaning on any areas where there is visible rust, bare metal or loose coating. CONTRACTOR shall coordinate with ENGINEER to determine the areas that require power tool cleaning.
 - a. Approximate number of rust spots for reservoir is given below:
 - 1). Reservoir Shell: 50
 - 2). Reservoir Roof: 30
 - 2. All new ventilation manway and roof hatch surfaces shall be prepared in accordance with per SSPC SP-6.
 - 3. CONTRACTOR shall be responsible for all third party claims for over spray.
 - 4. The existing exterior coating shall be handled as a non-hazardous waste as the lead and chromium content in the coating is below the regulatory limits. Legend Technical Services report, dated September 7, 2016, for the testing performed on the reservoir exterior coating is included in the Reference Materials.
- E. Reservoir Interior Surface:
 - 1. Remove grease and oil in accordance with SSPC SP-1.
 - 2. Unless specified otherwise, abrasive blast in accordance with SSPC SP-10

or better to remove rust, scale, and welding slag and spatter, and to provide roughened angular surface profile of not less than 3.5 mils and not more than 5.0 mils in depth when measured with Elcometer 224, or as recommended by the coating manufacturer. Where not possible to abrasive blast, power tool clean surfaces in accordance with SSPC SP-11.

3. When abrasive blasted surfaces rust or discolor before coating, abrasive blast surfaces again to remove rust and discoloration.
4. Do not coat surfaces before abrasive blasting.
5. When metal surfaces are exposed because of coating damage, abrasive blast surfaces before touching-up.
6. Include containment sheets over the reservoir openings to prevent airborne spreading of the blast material.
7. The City doesn't have available records on the existing interior coating system for the reservoirs. For bidding purposes, the CONTRACTOR shall consider the reservoir interior coating thickness to be 20 mils.

F. Exterior Coating Repairs Following Welding Activities:

1. Prior to welding, remove existing reservoir coating from the exterior reservoir surface, per SSPC SP-3, within a one-foot diameter area centered on the welding location.
2. Weld attachment to the reservoir surface.
3. Feather edge of surrounding sound coating around perimeter of the one-foot diameter area where the existing coating was removed. Feather edge must provide a sound, tightly adhering and smooth transition from the area exposed to the remaining existing coating system.
4. Remove grease and oil in accordance with SSPC SP-1.
5. Remove all surface imperfections (e.g., sharp fins, sharp edges, weld spatter, burning slag, scabs, slivers) using SSPC-SP2 and/or SSPC-SP3 before full surface preparation operations begin.
6. Coat surfaces within 12 hours of power tool cleaning. Do not coat surfaces before power tool cleaning.
7. Before applying the exterior prime coat, the prepared substrate must meet the SSPC-SP3 cleanliness standard requirements.
8. When metal surfaces are exposed because of coating damage, power tool clean surfaces before touching-up.
9. Brush apply new primer and coatings to the welded area. The new coating shall overlap the feathered edge of the existing coating by two inches.

G. Shop Primed Metal:

1. New Ventilation manway and roof hatch.
2. Submerged or non-submerged ferrous surfaces including structural steel and miscellaneous metal to be shop-primed, shall be prepared according to the coating manufacturers most current written guidelines for the submitted coating system and its intended service environment.
3. Correct abrades, scratched or otherwise damaged areas of shop prime coat by power tool cleaning in accordance with SSPC SP-3

4. When entire shop priming fails or has weathered excessively, or when recommended by paint manufacturer, abrasive blast shop prime coat to remove entire coat and prepare surface in accordance with SSPC SP-10.
5. When incorrect prime coat is applied, remove incorrect prime coat by abrasive blasting in accordance with SSPC SP-10.

3.02 GENERAL PROTECTION

- A. Protect adjacent surfaces not to be coated from weld spatter and droppings with drop cloths and other coverings:
 1. Mask off surfaces of items not to be coated or remove items from area.

3.03 GENERAL APPLICATION REQUIREMENTS

- A. Apply coatings in accordance with manufacturer's most current written instructions.
- B. Verify metal surface preparation immediately before applying coating in accordance with the specified cleanliness standard for that area.
- C. Allow surfaces to dry, except where coating manufacturer requires surface wetting before coating.
- D. Spot prime exposed metal of shop primed surfaces before applying primer over entire surface.
- E. Apply minimum number of specified coats.
- F. Apply coats to thicknesses specified.
- G. Apply additional coats when necessary to achieve specified thicknesses, especially at edges and corners.
- H. Coat surfaces without runs, drops, ridges, waves, holiday, laps, or brush marks.
- I. Remove spatter and droppings after completion of coating.
- J. When multiple coats of same material are specified, tint prime coat and intermediate coats with suitable pigment to distinguish each coat.
- K. Dust coatings between coats: Lightly sand and dust surfaces to receive high gloss finishes, unless instructed otherwise by coating manufacturer.
- L. Application of the coating to the reservoir interior surfaces shall be spray application only. No coating shall be applied to interior surface by roller application, unless otherwise specified. Apart from the specified interior coats, all weld seams, corners and edges, including roof plates, shall receive one additional hand rolled coat. The additional coat shall extend three to four inches on both sides of weld seams, and extend three to four inches from corners and edges.

- M. Application of the coating to the exterior reservoir surfaces shall be rolled according to the manufacturer's recommendations.
- N. Spray Application:
1. When using spray application, apply coating to thickness not greater than that suggested in coating manufacturer's instructions.
 2. Use airless spray method, unless air spray method is required by coating manufacturer's instruction or these Specifications.
 3. Conduct spray coating under controlled conditions. Protect adjacent construction and property from coating mist or spray.
- O. Drying and Recoating:
1. Limit drying time to that required by coating manufacturer's instructions.
 2. Do not allow excessive drying time or exposure which may impair bond between coats.
 3. Recoat within time limits recommended by coating manufacturer.
 4. When time limits are exceeded, re-prepare surface according to the coating manufacturer's most current written recommendations before applying another coat.
 5. When limitations on time between abrasive blasting and coating cannot be met before attachment of components to surfaces which cannot be abrasive blasted, coat components before attachment.
 6. Ensure primer and intermediate coats of coating are unscarred and completely integral at time of application of each succeeding coat.
 7. Touch up suction spots between coats and apply additional coats where required to produce finished surface of solid, even color, free of defects.
 8. Check for discontinuities on steel immersion surfaces using holiday detector (NACE SP0-188). Any discontinuities located shall be corrected in accordance with the coating manufacturer's most current written recommendations/guidelines. All corrected discontinuities shall be re-tested according to (NACE SP0-188) until compliant.
 9. Sand and recoat scratched, contaminated, or otherwise damaged coating surfaces so damages are invisible to naked eye.
- P. DFT readings shall be recorded in accordance with SSPC PA2- Level 3.
- Q. No coating work shall be performed on weekends.

3.04 FIELD QUALITY CONTROL

- A. Inspection will be performed prior to and following the abrasive blasting, power wash and power tool cleaning, and following each coat. Strip and remove defective coats, prepare surfaces and recoat. Successive coats shall only be applied following approval of previous coat or surface preparation.

- B. Control and check dry film thicknesses and integrity of coatings.
- C. Measure dry film thickness with calibrated thickness gauge.
- D. Dry film thickness reading equipment to be used must be certified and still within certification during the inspection process.
 - 1. Ferrous and Non-Ferrous substrates - Type 1 or Type 2 dry film thickness gauges, manufactured by Elcometer, Delfelsko or equal.

3.05 SCHEDULES OF ITEMS NOT REQUIRING COATING

- A. Nameplates.
- B. Caution signs
- C. Serial number tags.
- D. Control Panels.
- E. Instruments.

3.06 CLEANING

- A. As work proceeds and upon completion, promptly remove coating where spilled, splashed, or spattered.
- B. During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Upon completion of work leave premises neat and clean.

3.07 FIRST ANNIVERSARY INSPECTION

- A. Interior and exterior surfaces of the reservoirs shall be inspected by OWNER, ENGINEER and CONTRACTOR approximately 12 months after the coating work has been completed. Inspection, remedial work, if required, and report shall be provided as required by AWWA D102, Section 5.2.

END OF SECTION

DIVISION 13
SPECIAL CONSTRUCTION

SECTION 13208

MISCELLANEOUS WORK ASSOCIATED WITH WELDED STEEL STORAGE RESERVOIR

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope:
1. Provide all labor, materials, equipment and incidentals as shown on the Drawings, specified or required, to perform repairs and modifications to existing water storage reservoir. Included shall be the design, fabrication, delivery, and installation of required appurtenances as shown on the Drawings and specified herein. Coating is required in accordance with Section 09800.
- B. Related Sections:
1. Division 1 - General Requirements
 2. Section 09800 - Special Coatings
- C. See Drawings.

1.02 QUALITY ASSURANCE

- A. Design and Fabrication Criteria:
1. Except as otherwise shown on the Drawings or specified, all design, materials, joints, workmanship and all other aspects of the reservoir shall conform to AWWA D100.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ASTM A36, Standard Specification for Carbon Structural Steel.
 2. ASTM A529, Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
 3. AWWA D100, Standard for Welded Carbon Steel Tanks for Water Storage.
 4. AWWA D102, Standard for Coating Steel Water-Storage Tanks.
 5. AWWA C652, Standard for Disinfection of Water Storage Facilities.
 6. SSPC-SP3, SSPC Standard for "Power Tool Cleaning".
 7. SSPC-SP6, SSPC Standard for "Commercial Blast Cleaning".
 8. SSPC-SP10, SSPC Standard for "Near-White Metal Blast Cleaning".
 9. SSPC-SP11, SSPC Standard for "Power Tool Cleaning to Bare Metal".
 10. SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared By Dry Abrasive Blast Cleaning.
 11. NACE SP0178-2007, Design, Fabrication and Surface Finish Practices, for Tanks and Vessels to Be Lined for Immersion Service.

12. Occupational Safety & Health Administration (OSHA) standards.
13. ASME Section IX.

C. Requirements of Regulatory Agencies:

1. All work shall comply with OSHA Confined Space Entry, Arizona Department of Environmental Quality, AWWA, and NSF Regulation for potable water reservoirs.
2. In accordance with the Arizona Administrative Code (AAC) Section R18-4-213, all materials that may come into contact with drinking water shall conform to NSF International Standard 60 and 61.

1.03 SUBMITTALS

A. Shop Drawings:

1. Submit shop drawings for the following in accordance with Section 01340:
 - a. Roof ventilation manway.
 - b. Safety climb "D" Rings.
 - c. Roof hatch.
 - d. Rafter replacement.
 - e. Rafter tie rods.

B. Certificates:

1. Welder Qualification Certifications

C. Welding Procedures.

D. Product Data:

1. Submit Product Data Sheets, MSDS, and descriptions as appropriate of the following for review:
 - a. Gaskets.
 - b. Welding rods.

1.04 OWNER'S RESPONSIBILITIES

A. See Section 01030.

B. Isolation of the reservoir shall be performed by the OWNER. The CONTRACTOR shall coordinate with the OWNER and the ENGINEER to schedule the isolation and draining of the reservoir.

C. Potable water shall be furnished by the OWNER for the following services:

1. Initial reservoir disinfection and filling.
2. Water for any additional disinfection; if required, during the initial disinfection procedure to obtain satisfactory bacteriological samples.
3. If the reservoir must be emptied, re-sprayed, flushed and refilled to obtain satisfactory bacteriological samples, or because of extensive leakage, the OWNER will furnish additional water for the Work at the expense of

CONTRACTOR. CONTRACTOR shall also pay for the additional chlorine required.

- D. See Drawings.
- E. When CONTRACTOR has cleaned the reservoir floor after draining of reservoir, ENGINEER will conduct non-destructive testing to check floor plate thickness. CONTRACTOR shall schedule his Work to accommodate the testing. The testing is anticipated to take one day.

PART 2 PRODUCTS AND MODIFICATIONS

2.01 GASKET MATERIALS

- A. For manways that use a flat style gasket, the gasket shall be 1/4-inch thick and either of a Neoprene or an EPDM material with a durometer hardness of 50 on the Shore A scale.

2.02 ACCESSORIES AND MODIFICATIONS

- A. Roof Ventilation Manway
 1. Provide new roof ventilation manway, see Drawings.
 2. Shop prepare and prime the interior and exterior surface per Section 09800. Field apply the finish coats per Section 09800.
- B. External Water Level Gauge
 1. Remove and replace the existing 16 feet high external water level gauge board facing (sticker) with a new vinyl facing (sticker) of one foot level markings.
- C. Roof Hatch
 1. Remove and replace existing 24"x24" roof hatch with new roof hatch, see Drawings.
 2. Shop prepare and prime the interior and exterior surface Section 09800. Field apply the finish coats per Section 09800.
- D. Safety Climb 'D' Rings
 1. Shall meet OSHA Personal fall arrest systems requirements.
 2. Tensile Strength: Minimum of 5,000 pounds. D-ring shall be proof-tested to a minim tensile load of 3,600 pounds.
 3. Material
 - a. Anchorage Plate: Hot rolled steel, ASTM A36 or ASTM A529.
 - b. D-ring: Cadmium plated alloy steel.
 4. Apply shop prime and field finish coats to anchorage plates per Specification Section 09800. D-rings shall not be coated.

5. Model and Manufacturer
 - a. Model No. 2101634, DBI Sala.
 - b. Or pre-approved equal.

2.03 CONTINGENCY ITEMS

- A. The CONTRACTOR shall perform the following Work on the reservoir on a unit price basis if authorized by the OWNER:
 1. Contingency Item No. 1
 - a. Remove and replace up to twenty C8x11.5 existing outer rafters and associated bolted connections and clips with in kind rafters and carbon steel bolted connections and clips. CONTRACTOR to field verify dimensions.
 - b. The rafters shall be A36 steel.
 2. Contingency Item No. 2
 - a. Remove and replace up to twenty C8x11.5 existing inner rafters and associated bolted connections and clips with in kind rafters and carbon steel bolted connections and clips. CONTRACTOR to field verify dimensions.
 - b. The rafters shall be A36 steel.
 3. Contingency Item No. 3
 - a. Furnish and install up to one hundred 4-inch diameter, 1/4" thick A36 steel plates on floor (to cover deep pits).
 - b. The welding around these plates shall be 1/4 inch thick fillet weld.
 4. Contingency Item No. 4
 - a. For the interior of the reservoir, all existing weld spatter and defects shall be removed and repaired by welding and grinding in conformance with the requirements of NACE SP0178 for NACE Weld Preparation Designation "C". Included in this work but not limited to the radius grinding of all sharp edges on the overflow weir box, fill line, discharge line, manway curbs, covers, column base supports and any repair plates on the reservoir floor.
 - b. The unit price for surface repairs shall include all costs for labor, materials, and equipment to properly complete all work as described above, or otherwise required to complete the work. Measurement of the 2 man crew-hours required to complete the surface repairs shall include each hour of labor performed to physically repair by welding or grinding existing surface defects to the required condition. Such measurements of surface repair 2 man crew-hours will be recorded by the ENGINEER and all decisions will be final. All work incidental to performing these surface repairs, including but not limited to rigging, blasting and surface preparation, or otherwise required to complete the work shall be included in the unit price for the work. The services of a person on the ground (ground man), as required by OSHA, during times when surface repair work is being performed, shall also be considered incidental work, and expenses for such work or services shall be included in the unit price for the work. Hours for a ground

man will not be included in the measurement of the surface repair
2 man crew-hours.

- c. One 2 man crew-hour represents the unit cost basis for this bid item.

5. Contingency Item No. 5

- a. Remove and replace twenty existing 1/2-inch diameter, 5-foot long tie rods between outer rafters. CONTRACTOR to field verify dimensions.
- b. These tie rods are connected to the outer rafters via bolts and nuts.
- c. The tie rods shall be A36 steel.
- d. The tie rods shall be shop prepared and primed.
- e. Shop prepare and prime per Section 09800. Field apply the finish coats per Section 09800.

6. Contingency Item No. 6

- a. Remove and replace up to forty existing inner and/or outer rafter clips. The various sizes of rafter clips that may need to be replaced are 4"x8", 6"x8", 10"x10". For bidding purposes use 10"x10" rafter clips. CONTRACTOR to field verify dimensions.
- b. The rafter clips shall be 1/4 – inch thick A36 steel plates.
- c. The rafter clips shall be welded (1/4-inch thick fillet) on both sides.

- B. For bidding purposes, the amount of work necessary to perform the work has been estimated herein. Contingency items shall not be performed unless authorized by OWNER. This work will be monitored and verified by the ENGINEER in the field.

2.04 REPAIR AND MODIFICATIONS WORK

- A. Areas to be repaired and modified are described in Paragraphs 2.01, 2.02 and 2.03 (if needed) above, and as shown on Drawings.
- B. These shall be welded by a skilled, certified welder under the direction of the ENGINEER. The welders shall be certified in conformance with ASME Section IX and shall submit current copies of the welders certificates to the ENGINEER and the OWNER. All repairs by welding shall be ground smooth or radiused in conformance with the requirements of NACE Standard SP0178 and as directed by the ENGINEER. The repaired areas shall conform to the surface preparation requirements of Section 4, NACE Standard SP0178, NACE Weld Preparation Designation "C".
- C. No welding over coated steel surfaces is permissible. The CONTRACTOR shall adequately remove all coatings before welding. All areas that require welding shall be power tool cleaned before any welding is started.

- D. Welding Procedures:
1. All field welding shall be in accordance with Division 1 and AWWA D100.
 2. The location, type, size, and length of all welds shall be as shown on approved shop drawings. All field welds shall be of the manual shielded metal arc type. Welding shall not be done when the surface temperature is lower than 35 degrees Fahrenheit, when surfaces are wet, or when welders are exposed to inclement conditions.
 3. The CONTRACTOR shall submit all welding procedures to the ENGINEER for review four weeks prior to starting reservoir work.
 4. The CONTRACTOR can use alternate design details to those shown in the Drawings. However, the CONTRACTOR must submit all shop drawings to the ENGINEER for review.
 5. Certification and Tests:
 - a. CONTRACTOR shall, upon request from OWNER, provide certification in writing that all welds are in conformance with this specification and that any weld failure, defect and/or all damage relating therefrom will be repaired or replaced to the satisfaction of OWNER at no cost to OWNER. OWNER reserves the right to have all welds tested. Tests will be paid for by OWNER; however, in the event that work is defective, CONTRACTOR shall pay for the tests and shall replace all faulty work with work that complies with this Specification.
 6. Any additional repair work, uncovered by the CONTRACTOR or ENGINEER, during reconditioning shall not be initiated until duly authorized and executed change orders issued and signed by the OWNER and accepted and signed by the CONTRACTOR are completed. Refer to General Terms and Conditions for details involving increases or decreases in the amount of work.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Except as otherwise shown on the Drawings or specified, repairs shall be performed in accordance with the requirements of AWWA D100.

3.02 FIELD QUALITY CONTROL

- A. Qualifications of Welders and Welding Procedures:
1. Welding shall be performed only by welders qualified in accordance with AWWA D100.
 2. Welding shall be performed in accordance with AWWA D100.

B. Inspections:

1. The OWNER'S personnel and the ENGINEER shall at all times have access to the work, and the CONTRACTOR shall provide proper facilities for such access and inspection.
2. The ENGINEER reserves the right to inspect the work at any time for compliance with all requirements of the specifications.
3. The ENGINEER reserves the right to approve each phase of the Work before further work may be done, to halt all work deemed to be improper or not in compliance with the Specifications, and to require the CONTRACTOR to promptly correct all improper practices or deficient work.
4. Inspections may include wet and/or dry film thickness gauging, visual surface inspection by the naked eye and/or a suitable magnifying instrument to detect runs, sags, drips, cracks or other defects in the coating system.
5. Inspections may also include any other examination of the prepared surfaces or coating system, deemed necessary by the ENGINEER, including random destructive film thickness and coating adhesion checks. The interior wet area of the reservoirs shall be tested and inspected by the ENGINEER to ensure a holiday free surface. Interior wet area of the reservoir shall be tested and inspected by the ENGINEER to ensure that the coating has cured in accordance with the manufacturer's recommendations.
6. The CONTRACTOR shall provide all necessary inspection equipment (at the discretion of the ENGINEER), labor, rigging, rolling scaffolding, lighting, ventilation and other equipment to facilitate these inspections.
7. Any expenses incurred for corrective measures required as the result of improper practices and/or defective or deficient work shall be borne by the CONTRACTOR and the extent of these corrective measures shall be at the discretion of the ENGINEER. This includes costs for the ENGINEER to perform repeated and excessive re-inspection of defective or deficient work performed by the CONTRACTOR.
8. Such inspection shall not relieve the CONTRACTOR from any obligation to construct the Work strictly in accordance with the Drawings and Specifications. Work not so constructed shall be removed and replaced by the CONTRACTOR at his own expense.

3.03 CLEANING

- A. Exposed concrete surfaces shall be protected from blemishes and stains during reservoir coating. If discoloration of exposed concrete results from coating, rusting or any other aspects of reservoir work, it shall be removed to the satisfaction of ENGINEER.

- B. Adjacent painted surfaces shall be protected from discoloration, scratching or other damage. Any touch-up painting required to damaged areas prior to project completion and acceptance belongs to CONTRACTOR.
- C. On completion of the Work on the interior of the reservoir, the CONTRACTOR shall remove all dirt, litter and leave all surfaces in clean condition, scrubbing the same with water and approved soap or other cleaning agent. Cleaning and rinsing shall be performed by the CONTRACTOR using a power or jet truck with a minimum 2-inch diameter sanitary hose. When this has been completed, inspected and approved by the OWNER or ENGINEER, the final sterilization of said interior shall be done by the CONTRACTOR at no cost to the OWNER.
- D. The CONTRACTOR shall, at all times, keep the premises free from accumulations of waste material or rubbish caused by his employees or work. He shall clean-up abrasive material or rubbish on a daily regular schedule. All unneeded construction equipment shall be removed from the site and all damages repaired expeditiously so that the adjacent property is inconvenienced as little as possible.
- E. During exterior surface preparation and coating operations, the CONTRACTOR shall provide adequate protection and containment to prevent damage to adjacent structures and property by his operations. The CONTRACTOR shall also perform intermittent or periodic clean up of adjacent grounds to prevent the accumulation of sandblast sand and debris caused by his operations. This shall include but not be limited to, sidewalks, streets, driveways, yards, and rooftops.
- F. The CONTRACTOR shall be responsible for compliance with local, state and federal regulations concerning emissions or disposal of solid, particulate, liquid or gaseous matter as a result of the cleaning, painting or other operations. Compliance with this provision shall be accomplished without direct supervision from the ENGINEER or OWNER. The OWNER shall not grant additional compensation for changes in the law, regulations or interpretations of said laws or regulations. The burning of trash, paper or wood on the job site is not permitted. Unless otherwise provided by these specifications, the CONTRACTOR is responsible for all containing, shielding, waste retrieval or other precautions required by any regulatory agency at no additional cost to the OWNER. Any fines imposed on the OWNER or ENGINEER by any regulatory agency because of the CONTRACTOR's non-compliance with Environmental Regulations shall be paid or reimbursed by the CONTRACTOR.
- G. On or before the completion of work, the CONTRACTOR shall, unless otherwise directed in writing, remove all temporary works, tools and machinery or other construction equipment placed by him. He shall remove all rubbish from any grounds that he has occupied and shall leave all of the premises and adjacent

property affected by the operation in a neat and restored condition satisfactory to the ENGINEER.

3.04 DISINFECTION

- A. CONTRACTOR shall be responsible for disinfection. Disinfection shall conform to all applicable requirements of AWWA C652, and as specified below.
- B. After the reservoir has been coated and interior surfaces have thoroughly and properly cured, the inside of the reservoir shall be thoroughly cleaned in accordance with Paragraph 3.03. Interior of the reservoir shall be disinfected by spraying all surfaces, including underside of roof and roof support members, and inlet and outlet pipes, with a 200 ppm available chlorine solution. Solution shall remain in contact with surfaces for a minimum of 30 minutes. Technique shall be such that a sterile reservoir will result. After spray disinfection, the reservoir shall be filled to its overflow level. Following this procedure and subject to satisfactory bacterial testing and acceptable aesthetic quality, the water shall be delivered to the distribution system.
- C. The OWNER shall take a bacteria test of the water after disinfecting. If the water is considered not safe after testing, additional disinfecting and testing shall be performed by the CONTRACTOR at his expense until the reservoir is tested safe for use as part of a potable water supply system.
- D. The OWNER shall take a taste and odor test of the water after disinfecting to detect the presence of any volatile organic compounds (VOC's) imparted by the coating. If the water is not considered safe or acceptable after testing, further work shall be performed by the CONTRACTOR at his expense until the reservoir is tested safe and acceptable for use as part of a potable water supply system.
- E. Water for initial disinfection and for filling and for any additional disinfection during the initial disinfection procedure if required to obtain satisfactory bacteriological samples, will be furnished by the OWNER, to the site boundary. Responsibility belongs to CONTRACTOR for pumps, hoses and other temporary equipment required to fill the reservoir, all chlorine required, and for obtaining proper disinfection as determined by bacteriological tests made by the testing laboratory.
- F. If the reservoir must be emptied, re-sprayed, flushed and refilled to obtain satisfactory bacteriological samples, or because of extensive leakage, the OWNER will furnish additional water for the Work at the expense of CONTRACTOR. Additional chlorine required costs shall belong to CONTRACTOR.
- G. Supply all necessary pumps, hoses and other required equipment each time the reservoir need to be emptied.

3.05 AREAS TO PROTECT

- A. Do not coat over vent and overflow screens
- B. The entrance of dirt, sediment, blast media, and other debris into the discharge line, as well as the entrance of residual water into the reservoir area from a faulty valve is to be prevented by the CONTRACTOR. To prevent this and protect the piping, the CONTRACTOR shall, prior to any surface preparation work, insert into the inlet/outlet pipe a heavy duty, inflatable flex-plug, such as those manufactured by Peterson Products Company, P.O. Box 340, Fredonia, WI 53021-0340, 1-800-926-1926 or rubber plugs such as those manufactured by Vanderlans and Sons, Inc., 1320 South Sacramento Street, Lodi, CA 95240, 1-800-452-4902.

3.06 RESERVOIR INTERIOR INSPECTIONS

- A. CONTRACTOR, ENGINEER and OWNER will perform the reservoir inspections as specified below:
 - 1. Interior inspection after cleaning and prior to surface preparation of the reservoir. After this inspection, and if needed, ENGINEER will authorize the Contingency Items under Paragraph 2.03.
 - 2. Interior inspection after blasting interior surface of the reservoir. This inspection will be performed to confirm the prior inspection findings.
 - 3. CONTRACTOR shall provide safe access (confined space entry) and necessary equipment to perform the inspections. The equipment includes rolling scaffolding to access shell, roof rafters and dollar plate, lighting and forced ventilation (if required).
- B. Prior to any of the above inspections, CONTRACTOR shall clean reservoir interior shell and floor surfaces to remove any dirt, oil, grease and sediments, and the floor to be relatively dry.

END OF SECTION

DIVISION 15
MECHANICAL

SECTION 15062

DUCTILE IRON PIPING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Ductile iron piping, joints, fittings, appurtenances, and spools.
- B. Related Sections: CONTRACTOR shall coordinate the requirements of the work in this Section along with the requirements of the Sections listed below which includes, but is not necessarily limited to, work that is directly related to this Section.
- C. See Drawings.

1.02 REFERENCES

- A. American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME):
 - 1. B 16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
- B. American Society for Testing and Materials (ASTM):
 - 1. A 47 - Ferritic Malleable Iron Castings.
 - 2. A 183 - Carbon Steel Track Bolts and Nuts.
 - 3. A 536 - Ductile Iron Castings.
 - 4. A 674 - Standard Practice Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids.
- C. American Water Works Association (AWWA):
 - 1. C 104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. C 105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - 3. C 110 - Ductile-Iron and Gray-Iron fittings.
 - 4. C 111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 5. C 150 - Thickness Design of Ductile-Iron Pipe.
 - 6. C 151 - Ductile-Iron Pipe, Centrifugally Cast for Water.
 - 7. C 219 - Bolted, Sleeve Type Couplings for Plain-End Pipe.
 - 8. C 600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
- D. National Sanitation Foundation (NSF) 61.

1.03 SUBMITTALS

- A. Product Data: Photographs, drawings, and descriptions of piping, fittings, gaskets, couplings, and pipe lining.
- B. Test Reports: Manufacturer's test reports for polyethylene lining certifying successful performance of the wet sponge spark tests.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Block piping material for shipment, prevent damage to castings and linings.
- B. Carefully handle piping material during loading, unloading, and installation. Do not drop piping material from trucks. Lower piping material by mechanical means. Do not drop or pound pipe to fit grade.
- C. Repair damaged pipe lining to match quality, thickness, and bonding or original lining. When lining cannot be repaired or repairs are defective, replace defective piping with undamaged piping.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Ductile Iron Piping:
 - 1. Type, Typical: AWWA C 150 and AWWA C 151 with minimum Pressure Class 200.
- B. Joints:
 - 1. Mechanical Joints: Conform to AWWA C 110 and AWWA C 111.
 - 2. Restrained Mechanical Joints:
 - a. EBAA Iron Mega-lug restrained joints.
 - b. Or pre-approved equal.
 - 3. Gaskets for Mechanical Joints:
 - a. Pressure rating of 200 psi, suitable for temperature up to 150 degrees Fahrenheit.
 - b. Gasket shall be rubber gasket (styrene butadiene rubber).
 - c. It shall meet the requirement of AWWA C.111.
 - d. Manufacturers:
 - 1) U.S. Pipe.
 - 2) Harco.
 - 3) Or pre-approved equal.
 - 4. Exposed surfaces of pipe, accessories, etc. for potable water, shall comply with NSF 61 requirements.

2.02 ACCESSORIES

- A. Couplings:
 - 1. Standard: AWWA C219.
 - 2. Body: ASTM A536 Ductile Iron
 - 3. Mechanically restrained.
 - 4. Corrosion resistant, low alloy, high strength steel bolts and nuts per AWWA C111.
 - 5. Coating:
 - a. The coupling sleeve internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of AWWA C213
 - b. The coupling sleeve interior surface coating shall meet NSF-61.
 - c. The coupling sleeve exterior surface shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of AWWA C116.
 - 6. Manufacturers:
 - a. Ebaa Iron Inc.
 - b. Romac Industries Inc.
 - c. Or pre-approved equal.

2.03 PIPE LININGS AND COATINGS

- A. Cement-Mortar Lining and Coating: AWWA C 104/ANSI A 21.4, applied on clean bare metal surfaces; extended to faces of flanges, ends of spigots, and shoulders of hubs; painted with bituminous material.
 - 1. Coating on Cement-Mortar Coating: Bituminous material, or none when specified to receive another coating.
- B. Coatings
 - 1. Buried Piping: Provide bituminous coating.

PART 3 EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. Install ductile iron piping in accordance with AWWA C 600.
 - 2. Lay mechanical joint or bell and spigot pipe with 1/8 inch space between the spigot and shoulder of the pockets.
 - 3. All buried piping shall be restrained using products listed in Section 2.01.
- B. Special Techniques:
 - 1. Polyethylene Encasement: Wrap ductile iron pipe to be buried with polyethylene encasement in accordance with ASTM A 674. Repair tears and make joints with double plastic tape wrap.
 - a. Polyethylene: AWWA C 105.

- b. Plastic Tape Wrap: Manufacturers:
 - 1) Polyken Pipeline Coatings, Polyken Number 910.
 - 2) The Tapecoat Company, Tapecoat CT.
 - 3) Or pre-approved equal.

3.02 JOINTS

- A. Install types of joints as specified on Drawings.

3.03 DISINFECTION

- A. The interior surfaces of the new spool pieces, coupling and new valve shall be cleaned and swabbed with five (5) percent hypochlorite disinfecting solution.

END OF SECTION

SECTION 15115

GATE VALVES AND APPURTENANCES

PART 1 GENERAL

1.01 DESCRIPTION

- A. Scope:
1. Provide all labor, materials, equipment and incidentals required to furnish and install all gate valves and appurtenances complete and operational as shown on the Drawings and as specified.
 2. The Work includes installation of one 24-inch diameter gate valve on the reservoir fill line.
- B. Coordination:
1. Review installation procedures under other Sections and coordinate with the Work which is related to this Section.
- C. Related Sections: CONTRACTOR shall coordinate the requirements of the Work in this Section along with the requirements of the Sections listed below which includes, but is not necessarily limited to:
1. Division 1 - General Requirements
 2. Section 09800 - Special Coatings.
 3. Section 13208 - Miscellaneous Work Associated with Welded Steel Storage Reservoir.
- D. See Drawings.

1.02 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
1. Manufacturer shall have a minimum of five years experience of producing substantially similar equipment, and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.
 2. Gate valves shall be the product of one manufacturer.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ANSI B16.1, Cast Iron Pipe Flanges and Flanged Fittings
 2. AWWA C 110, Ductile-Iron and Gray-Iron Fittings.
 3. ASTM A 48, Specification for Gray Iron Castings.
 4. ASTM A 126, Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

5. ASTM A 307, Specification for Carbon Steel Bolts, Studs and Thread Rod 60,000 psi minimum Tensile Strength.
6. ASTM A 354, Specification for Quenched and Tempered Alloy Steel Bolts, Studs and Other Externally Threaded Fasteners.
7. ASTM A 436, Specification for Austenitic Gray Iron Castings.
8. ASTM A 536, Specification for Ductile Iron Castings.
9. ASTM B 62, Specification for Composition Bronze or Ounce Metal Castings.
10. AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
11. AWWA C515, Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
12. AWWA C550, Protective Interior Coatings for Valves and Hydrants.
13. AGMA Standards.
14. NEMA, National Electrical Manufacturer's Association.
15. NSF 61, Drinking Water System Components-Health Effects.

1.03 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
 1. Manufacturer's literature, illustrations, paint certifications, specifications, detailed drawings, data and descriptive literature on all valves and appurtenances.
 2. Deviations from Contract Documents.
 3. Engineering data including dimensions, materials, size and weight.
 4. Fabrication, assembly, and installation diagrams.
 5. Certificates of compliance with AWWA Standards, where applicable.
 6. Corrosion resistance information to confirm suitability of the valve materials for the application. Information on chemical resistance of elastomers shall be furnished from the elastomer manufacturers.
 7. Complete nameplate data of valves.
 8. Special tools list.
 9. C_v values and headloss curves.
- B. Operation and Maintenance Manuals:
 1. Submit complete installation, operation and maintenance manuals including test reports, maintenance data and schedules, description of operation, and spare parts information.
 2. Furnish Operation and Maintenance Manuals in conformance with the requirements of Section 01340.
- C. Shop Tests:
 1. Hydrostatic tests shall be performed, when required by the valve specifications included herein.
- D. Certificates: Where specified or otherwise required by ENGINEER, submit test certificates.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the Work.
- B. All boxes, crates and packages shall be inspected by CONTRACTOR upon delivery to the site. CONTRACTOR shall notify ENGINEER if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms or other supports. Protect steel members and packaged materials from corrosion and deterioration.

PART 2 PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Valves shall have manufacturer's name and working pressure cast in raised letters on valve body.
 - 2. Manual valve operators shall turn clockwise to close, unless otherwise specified. Valves shall indicate the direction of operation.
 - 3. The gear actuator and the valve components shall be able to withstand a minimum pull of 200 pounds on the manual operator and an input torque of 300 foot pounds to an actuator nut. Manual operators include handwheel, chain, crank, lever and a T-handle wrench.
 - 4. Buried valves shall have mechanical joint ends. All bolts shall be Type 316 stainless steel.
 - 5. Buried valves shall be provided with adjustable two piece valve boxes and provided with extension stems, operating nuts and covers, unless otherwise shown on the Drawings or specified. Extension stems shall terminate 12-inches below finished grade.
 - 6. Iron body valves shall be provided with screwed-on seat rings. Buried or submerged gate valves shall be of the non-rising stem type. Exposed gate valves shall be rising stem type. Rising stem valves and brass non-rising stem valves shall be provided with O-ring stem seals.
 - 7. For stainless steel bolting, except where Nitronic-60 nuts are required, use anti-seize compound, graphite free, to prevent galling. Strength of the joint shall not be affected by the use of anti-seize compound.
 - 8. All other bolts, nuts and studs shall, unless otherwise approved, conform to ASTM A 307, Grade B; or ASTM A 354.
 - 9. Bolts and nuts shall have hexagon heads and nuts.
 - 10. All materials of construction of the valves shall be suitable for the applications as shown on the Drawings.
 - 11. Protect wetted parts from galvanic corrosion due to contact of two different metals.

12. Buried service valves shall be provided with grease filled actuators with position indicators.
13. Gasket material and installation shall conform to manufacturer's recommendations.
14. Identification: Identify each valve 4-inches and larger with a stainless steel nameplate stamped with the approved designation. Nameplate shall be permanently fastened to valve body at the factory. Stenciled designations are acceptable for buried valves.
15. All valves shall meet NSF 61 requirements.

B. Gate Valves:

1. Buried, 3-inch Diameter and Larger:
 - a. Standard: AWWA C515.
 - b. Type: Resilient seat, nonrising stem.
 - c. Construction:
 - 1) Body and Bonnet: Ductile Iron, ASTM A 536, coated inside and out with fusion bonded epoxy.
 - 2) Gate: Ductile Iron, ASTM A 536, symmetrically and fully encapsulated with an elastomer having a minimum 1/8-inch thickness suitable for the service intended.
 - 3) Stem: low zinc bronze stem.
 - 4) Stem Seal: "O"-Ring.
 - 5) Stuffing box and Bonnet bolts and nuts: Steel; Bolts – SAE J429 Grade 2; Nuts – ASTM A-563 Grade A – Plated to ASTM F1941 Class Fe/Zn 12c.
 - 6) Provide position indicators for non-rising stem valves.
 - 7) Stuffing Box: Ductile iron, ASTM A-536.
 - d. Pressure Rating: Gate valves shall have the following minimum pressure ratings unless otherwise specified in the Valve Schedule.
 - 1) 3-inch through 16-inch diameter valves: 250 pounds per square inch.
 - 2) 16-inch and larger diameter valves: 150 pounds per square inch.
 - e. End Connection: Unless otherwise shown on the Drawings or specified, valves shall be mechanical joint ends conforming to AWWA C111.
 - f. Interior Coating:
 - 1) All valves shall be coated inside. The steel, cast-iron and ductile iron surfaces, except machined surfaces, shall be epoxy coated in accordance with AWWA C550.
 - g. Testing:
 - 1) Test all valves in conformance with AWWA C515.
 - h. Gear Actuators for Manually Operated Valves:
 - 1) Provide valves with gear actuators conforming to AWWA C515.

- 2) Size gear actuators for the following maximum differential pressures:
 - a) Maximum Differential Pressure Across Closed Valve: 100 psi.
- i. Product and Manufacturer: Provide one of the following:
 - 1) Mueller Company.
 - 2) American Flow Control, American-Darling, Series 2500.
 - 3) Or pre-approved equal.

2.02 APPURTENANCES FOR BURIED VALVES

- A. Wrench Nuts:
 1. Provide wrench nuts on all buried valves of nominal 2-inch size conforming to AWWA C515.
 2. Arrow indicating direction of opening the valve shall be cast on the nut along with the word "OPEN".
 3. Material: Ductile iron.
 4. The nut shall be secured to the stem by mechanical means.
- B. Extension Stems for Non-Rising Stem Valves and Quarter Turn Buried Valves:
 1. Provide extension stems to bring the operating nut to 6-inches below the valve box cover.
 2. Minimum Size and Material: Same as valve stem.
 3. Maximum Unsupported Length: Three feet.
 4. Provide top nut and bottom coupling of ductile iron with pins and set screws of Type 316 stainless steel.
- C. Valve Boxes:
 1. Valve boxes shall be as shown on the Drawings and as required.
 2. Type: Heavy duty, suitable for highway loading, 2-piece telescopic, and adjustable. Lower section shall enclose operating nut and stuffing box and rest on bonnet.
 3. Material: Cast or ductile iron.
 4. Coating: Two coats of asphalt varnish conforming to Federal Specification TT-C-494.
 5. Marking: As required for service.

2.03 TOOLS AND SPARE PARTS

- A. Provide the following T-Handle Operating Wrenches for Buried Valves:
 1. T-handle operating wrench of suitable length and size for each valve that is not readily accessible to direct operation.
 2. Quantity: Provide one of each length and size required.

2.04 SURFACE PREPARATION AND PAINTING

- A. Valves, appurtenances, etc., shall receive shop primer and shop finish coating conforming to the requirements of Section 09800, Special Coatings. If any damage to the paint system occurs, the equipment shall be repainted as directed by the OWNER.
- B. Surface preparation and painting shall conform to the requirements of Section 09800, Special Coatings.
- C. All gears, bearing surfaces, machined surfaces and other surfaces which are to remain unpainted shall receive a heavy application of grease or other rust-resistant coating. This coating shall be maintained during storage and until the equipment is placed into operation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install all valves and appurtenances in accordance with the manufacturer's instructions and recommendations, and MAG Standard Specification 610.7 and Avondale Supplemental MAG Detail A1310.
- B. Conform to appendices of AWWA Standards, where applicable.
- C. For buried valve installations, set valve boxes plumb and centered, with soil carefully tamped to a lateral distance of four feet on all sides of the box, or to the undisturbed trench face if less than four feet.

3.02 FIELD TESTS AND ADJUSTMENTS

- A. Adjust all parts and components as required to provide correct operation of the valves.
- B. Conduct a functional field test on each valve in the presence of the ENGINEER to demonstrate that each valve operates correctly.
- C. Test ten percent valves of each type by applying 200 pounds effort on the manual operators. There shall be no damage to the gear actuator or the valve.

3.03 MANUFACTURER'S SERVICE

- A. A factory trained representative shall be provided for installation supervision, start-up and test services and operation and maintenance personnel training services. The representative shall make a minimum of one visit, eight hours on site for each visit, to the site. Manufacturer's representative shall test operate the

system in the presence of the ENGINEER and verify that the valves conform to requirements. Manufacturer's representative shall revisit the job site as often as necessary until all trouble is corrected and the installation is entirely satisfactory.

- B. All manufacturer service costs, including travel, lodging, meals and incidentals, shall be considered as included in CONTRACTOR's bid price.

END OF SECTION

REVISION SUMMARY

Revisions to Technical Specifications

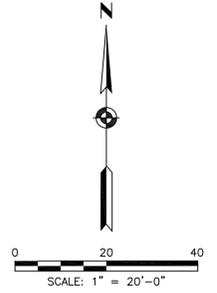
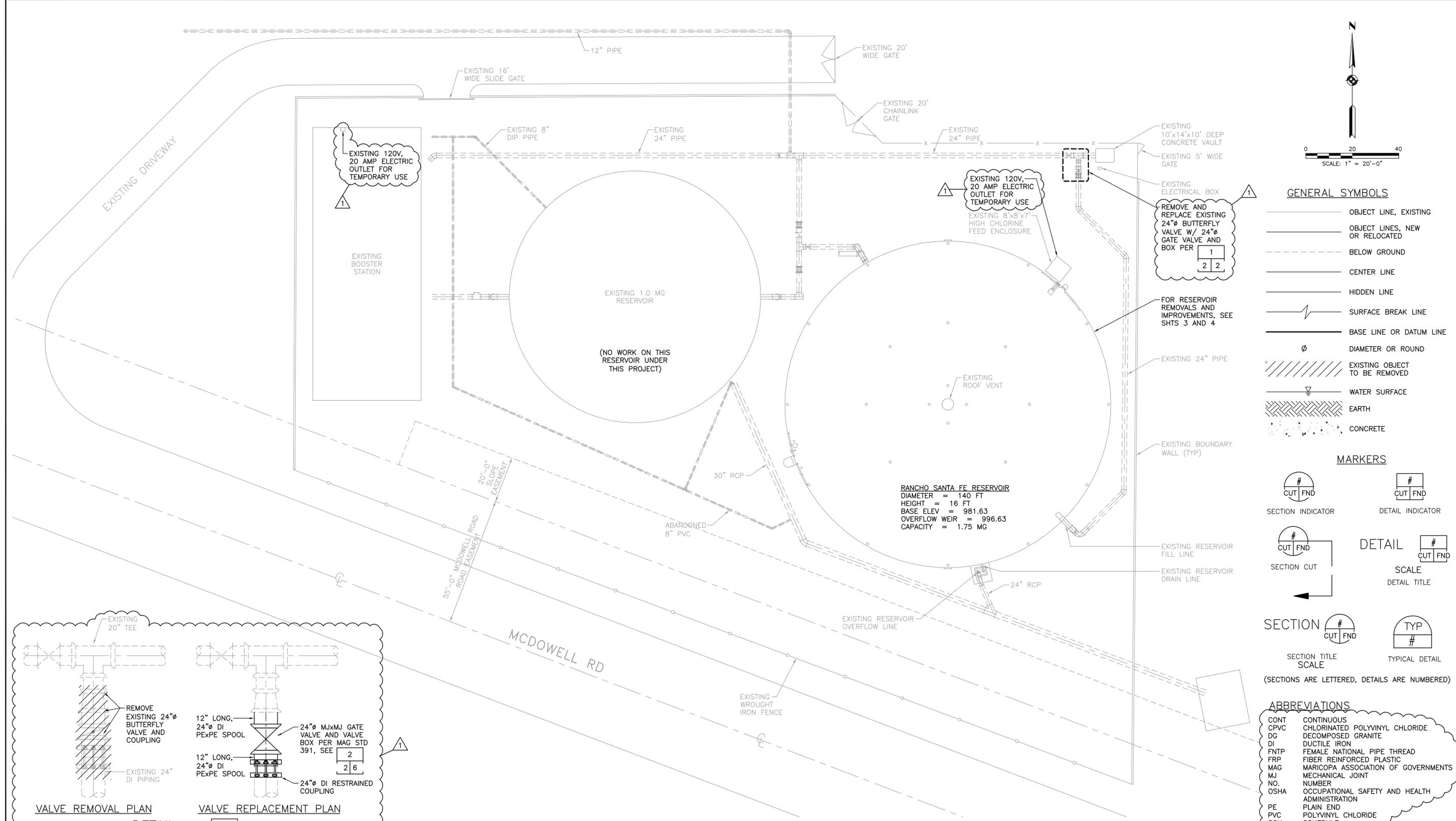
1. Table of Contents: Add new Section 15062 – Ductile Iron Piping.
2. Section 01030 – Summary of Work: Part 1 (General), Section 1.11(Safety Plan), Paragraph A –submittal date was deleted.
3. Section 01040 – Order of Construction: Part 3 (Execution), Paragraph A, “150 has been replaced with “154.”
4. Section 01040 – Order of Construction: Part 3 (Execution), Paragraph C(1), “20” has been replaced with “24.”
5. Section 01210 – Contingency Items: Part 3 (Execution); Section 301 (Schedule of Contingencies), Paragraph A has been deleted and replaced.
6. Section 01450 – Measurements and Payments: Part 3 (Execution), Paragraph A(2), each occurrence of “20” has been replaced with “24.”
7. Section 01450 – Measurements and Payments: Part 3 (Execution), Paragraph A(10) has been deleted and replaced.
8. Section 01500 – Temporary Facilities: Part 1 (General), Section 1.02 (Temporary Utilities), Paragraph G has been added.
9. Section 02250 – Ground Surface Restoration: Part 2 (Products), Section 2.01 (Materials), Paragraph A(1) has been deleted and replaced.
10. Section 02250 – Ground Surface Restoration: Part 3 (Execution), Section 3.01 (Restoration), Paragraph A, “Bid Item No. 3” was revised to “Bid Item No. 1.”
11. Section 09800 – Special Coatings: Part 1(General), Section 1.11 title “Contingency Items” was revised to “Allowance Items.”
12. Section 09800 – Special Coatings: Part 1(General), Section 1.11 (Allowance Items), Paragraph A(1), the title has been deleted and replaced.
13. Section 09800 – Special Coatings: Part 1 (General) Section 1.11 (Allowance Items), Paragraph A(1)(c) has been deleted.
14. Section 09800 – Special Coatings: Part 2 (Products), Section 2.01 (Materials), Paragraph B(3) has been deleted and replaced.
15. Section 09800 – Special Coatings: Part 2 (Products), Section 2.01 (Materials), Paragraph B(5) has been deleted and replaced.

16. Section 09800 – Special Coatings: Part 3 (Execution), Section 3.01 (General Preparation), Paragraph D(4) has been deleted and replaced.
17. Section 15062 – Ductile Iron Piping has been added.
18. Section 15115 – Gate Valves and Appurtenances: Part 1 (General), Section 1.01 (Description), Paragraph A(2), “20” has been replaced with “24.”
19. Section 15115 – Gate Valves and Appurtenances: Part 2 (Products), Section 2.01 (Materials), Paragraphs A (General) and B (Gate Valves) have been deleted and replaced.
20. Section 15115 – Gate Valves and Appurtenances: Part 2 (Products), Section 2.03 (Anchor and Miscellaneous Mounting Bolts) was deleted. Former Section 2.04 is now Section 2.03 (Tools and Spare Parts). Former Section 2.05 is now Section 2.04 (Surface Preparation and Painting).

EXHIBIT 2
TO
ADDENDUM NO. 2
TO
INVITATION FOR BIDS NO. PW 17-010

[Plan Sheets]

See following pages.



GENERAL SYMBOLS

	OBJECT LINE, EXISTING
	OBJECT LINES, NEW OR RELOCATED
	BELOW GROUND
	CENTER LINE
	HIDDEN LINE
	SURFACE BREAK LINE
	BASE LINE OR DATUM LINE
	DIAMETER OR ROUND
	EXISTING OBJECT TO BE REMOVED
	WATER SURFACE
	EARTH
	CONCRETE

MARKERS

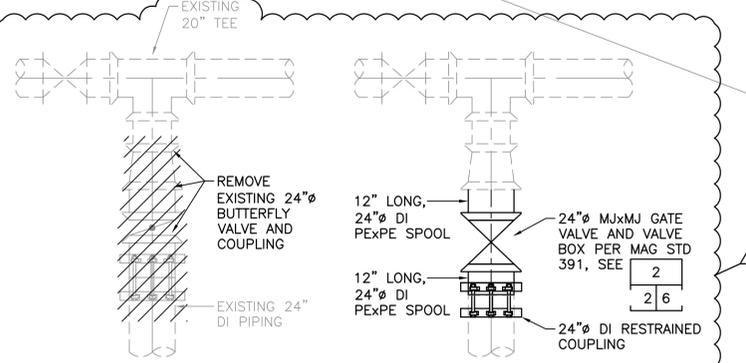
	SECTION INDICATOR
	SECTION CUT
	DETAIL INDICATOR
	DETAIL SCALE
	DETAIL TITLE
	SECTION TITLE
	TYPICAL DETAIL

(SECTIONS ARE LETTERED, DETAILS ARE NUMBERED)

ABBREVIATIONS

CONT	CONTINUOUS
CPVC	CHLORINATED POLYVINYL CHLORIDE
DG	DECOMPOSED GRANITE
DI	DUCTILE IRON
FNTP	FEMALE NATIONAL PIPE THREAD
FRP	FIBER REINFORCED PLASTIC
MAG	MARICOPA ASSOCIATION OF GOVERNMENTS
MJ	MECHANICAL JOINT
NO.	NUMBER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
SCH	SCHEDULE
SHT(S)	SHEET(S)
STD	STANDARD
TYP	TYPICAL
W/	WITH

GENERAL NOTES:
1. ALL NEW WORK IS SHOWN IN BOLD.

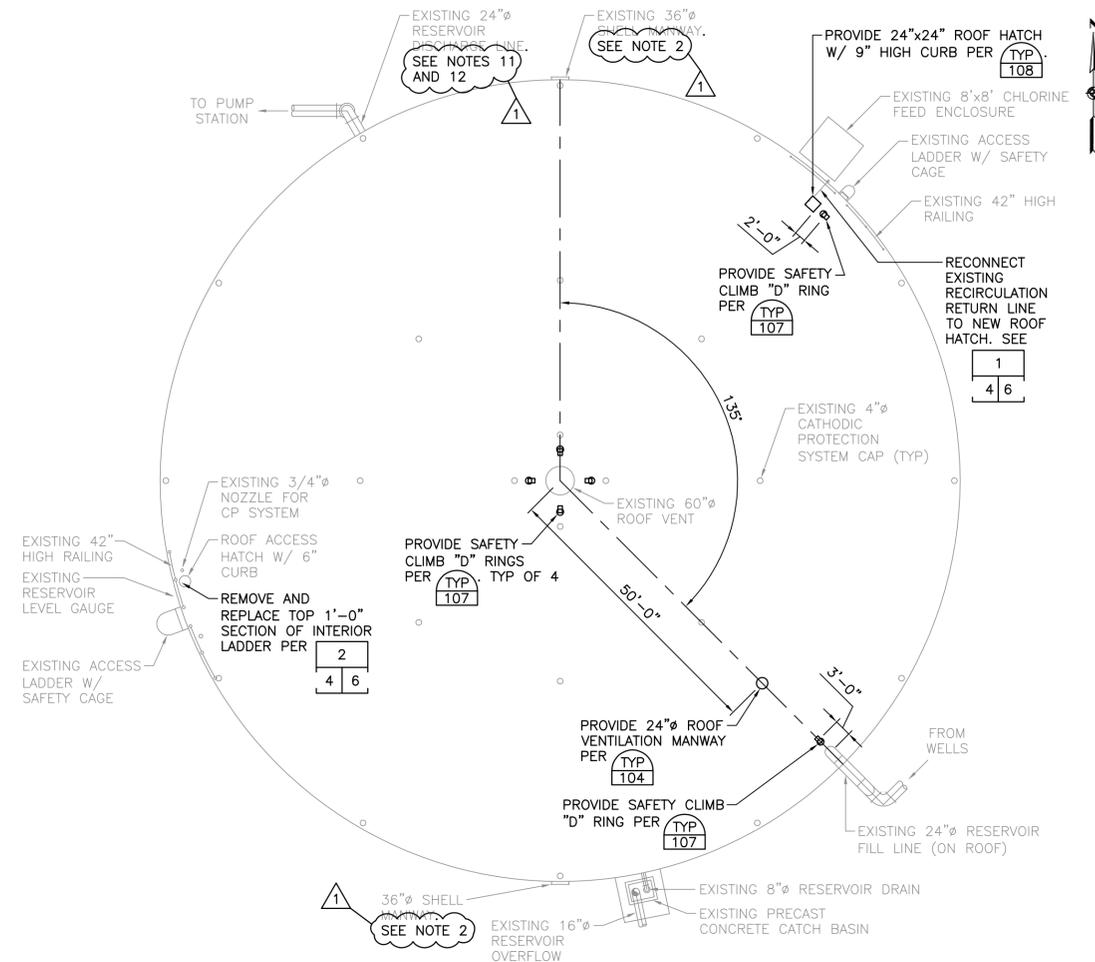


DETAIL 1
SCALE: 1/4"=1'-0"

- NOTES:**
1. THE EXISTING VALVE IS 5 FEET DEEP (TO TOP OF THE VALVE). THE EXISTING WATER MAIN PIPE IS DI PIPE.
 2. EXCAVATION LIMITS SHALL BE DETERMINED BY THE CONTRACTOR.
 3. EXCAVATED AREA SHALL BE A SAFE PLACE TO WORK PER OSHA REGULATIONS.
 4. SHORING SHALL BE PROVIDED, AS NEEDED, TO PROTECT EXCAVATED SIDES.
 5. BACKFILL WITH EXCAVATED NATIVE MATERIAL AND COMPACT TO 90% OF MAXIMUM DENSITY IN 8" MAXIMUM LIFTS.
 6. PLACE 2 INCH THICK DG ON DISTURBED AREA.
 7. CITY WILL ISOLATE THE LINE FOR 8 HOURS TO ACCOMMODATE THE VALVE REMOVAL AND REPLACEMENT.
 8. DECOMPOSED GRANITE (DG) SHALL BE FURNISHED AND INSTALLED IN AREAS TO BE DEFINED BY THE CITY AND ENGINEER.

INFORMATION OF THE EXISTING SITE ON THIS SHEET IS FOR GENERAL REFERENCE PURPOSES. INFORMATION DOES NOT REPRESENT A FIELD SURVEY.

NO. 1	DATE 9/26/16	REVISION	ADDENDUM CHANGES
NCS ENGINEERS 202 E. EARLL DR., SUITE 110 PHOENIX, AZ 85012 (602) 629-0206			
NCS Engineers			
CAPITAL IMPROVEMENTS PROJECT RANCHO SANTA FE RESERVOIR MODIFICATIONS AND COATING SITE PLAN, GENERAL SYMBOLS, MARKERS AND ABBREVIATIONS			
PROJECT NUMBER	PW17-010	SHEET NUMBER	2 OF 6
EXP. DATE	09/30/18	PROJECT NUMBER	PW17-010

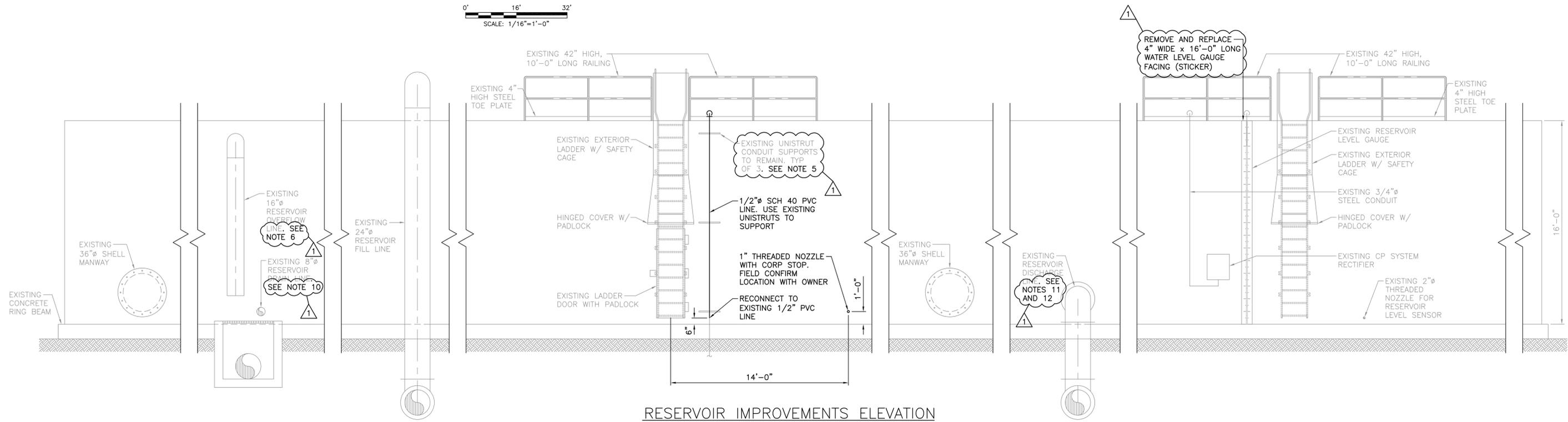


RESERVOIR IMPROVEMENTS ROOF PLAN

SCALE: 1/16"=1'-0"



- CONSTRUCTION NOTES:**
1. REMOVE AND REINSTALL CONDUIT(S) AND PIPING ON RESERVOIR ROOF AND SHELL TO ACCOMMODATE COATING.
 2. REMOVE AND REPLACE EXISTING SHELL MANWAY GASKET WITH NEW 36"Ø SHELL FLANGE MANWAY GASKET.
 3. PERFORM RESERVOIR INTERIOR SURFACE PREPARATION AND COATING PER SPECIFICATION SECTION 09800.
 4. PERFORM RESERVOIR EXTERIOR SURFACE PREPARATION AND OVERCOATING PER SPECIFICATION SECTION 09800.
 5. REMOVE EXISTING COATING ON APPROXIMATELY 3" WIDE AREA AROUND THE EXISTING UNISTRUT SUPPORTS BY POWER TOOL CLEANING TO BARE METAL AND RECOAT PER SPECIFICATION SECTION 09800, SYSTEM NO. 3.
 6. REMOVE RUSTING ON THE OVERFLOW PIPE EDGE BY POWER TOOL CLEANING AND RECOAT PER SPECIFICATION SECTION 09800, SYSTEM NO. 3.
 7. REMOVE AND REINSTALL SCREEN, ON THE OVERFLOW PIPE OUTLET, TO ACCOMMODATE CLEANING AND COATING.
 8. SEE SPECIFICATIONS FOR EXISTING SYSTEMS TO BE REMOVED AND REINSTALLED BY CITY TO ACCOMMODATE WORK.
 9. PIPING AND CONDUIT LOCATED ON RESERVOIR SHALL RECEIVE SURFACE PREPARATION AND COATING PER SPECIFICATION SECTION 09800.
 10. FOR NUMBER OF RUST SPOTS TO RECEIVE SURFACE PREPARATION AND COATING, SEE COATING SPECIFICATION SECTION 09800.
 11. REMOVE RUSTING ON THE DRAINLINE 90° ELBOW BY POWER TOOL CLEANING AND RECOAT PER SPECIFICATION SECTION 09800, SYSTEM NO. 1.
 12. REMOVE COATING ON THE 24"Ø DISCHARGE LINE BY POWER TOOL CLEANING AND RECOAT PER SPECIFICATION SECTION 09800, SYSTEM NO. 1.
 13. EXTEND SURFACE PREPARATION AND COATING TO 6" DEPTH BELOW GRADE. EXCAVATE AND BACKFILL AROUND DISCHARGE PIPING TO ACCOMMODATE SURFACE PREPARATION AND COATING.



RESERVOIR IMPROVEMENTS ELEVATION

SCALE: 1/4"=1'-0"

NO. 1	DATE	19/05/16	ADDENDUM CHANGES
	DATE		
PROJECT NAME		CAPITAL IMPROVEMENTS PROJECT	
PROJECT NUMBER		PW17-010	
PROJECT LOCATION		RANCHO SANTA FE RESERVOIR MODIFICATIONS AND COATING	
SHEET NAME		RESERVOIR IMPROVEMENTS PLAN	
DRAWING NUMBER		PW17-010	
DESIGNED BY		RAMESH NARASIMHAN	
CHECKED BY		RAMESH NARASIMHAN	
DATE		09/30/18	
ORIGINAL PLAN DATE		SEPTEMBER 2016	
LATEST REVISION DATE			
SHEET NUMBER		4 OF 6	
PROJECT NUMBER		PW17-010	

NCS ENGINEERS
202 E. EARLL DR., SUITE 110
PHOENIX, AZ 85012
(602) 629-0206

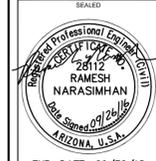


EXHIBIT 3
TO
ADDENDUM NO. 2
TO
INVITATION FOR BIDS NO. PW 17-010

[Price Sheet]

See following page.

PRICE SHEET

Rancho Santa Fe Reservoir Modifications and Coating
PW17-010

NOTE: All pricing blanks must be filled in. Empty or unfilled spaces in the Bid Price Sheet shall result in a determination that a Bid is non-responsive.

Item No.	Description of Material and/or Services	Quantity	Unit	Unit Price	Extended Price
1.	All Work As Defined in Drawings and Specifications Complete Except Item Nos. 2, 3 and 10	1	LS	\$	\$
2.	Remove and Replace 24-inch Gate Valve As Defined in Drawings and Specifications Complete	1	LS	\$	\$
3.	Furnish and Install Decomposed Granite (DG) as Defined in Drawings and Specifications Complete	1	TON	\$	\$
4.	Contingency Item No. 1 – Remove and Replace Outer Rafter	20	EACH	\$	\$
5.	Contingency Item No. 2 – Remove and Replace Inner Rafter	20	EACH	\$	\$
6.	Contingency Item No. 3 – Floor Weld Plate Installation	100	EACH	\$	\$
7.	Contingency Item No. 4 – Two Man Weld Crew Hour	16	HOUR	\$	\$
8.	Contingency Item No. 5 – Remove and Replace Tie Rods	40	EACH	\$	\$
9.	Contingency Item No. 6 – Remove and Replace Rafter Clipsk	40	EACH	\$	\$
10.	Dehumidification and Ventilation System	1	ALLOW	\$ 50,000.00	\$ 50,000.00
	TOTAL BID AMOUNT*				\$

*** ALL BIDS ARE PRESUMED TO INCLUDE ALL APPLICABLE TAXES. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORK CONTEMPLATED BY THE PLANS FOR THE PROJECT IS BID ON THE PRICE SHEET.**

**CITY OF AVONDALE
ACKNOWLEDGMENT OF ADDENDA RECEIVED
INVITATION FOR BIDS**

**RANCHO SANTA FE RESERVOIR MODIFICATIONS AND COATING
PW17-010 (WA1372)**

Addendum No. 2

_____, affirms that ADDENDUM No. 2 has been
(Name of Vendor/Designee)
received and that the information contained in ADDENDUM No. 2 has been incorporated in
formulating the Vendor's Offer.

_____, _____ 2016
Signed Date

Print Name

Title

Company Name

Address

City, State, Zip Code

END OF ADDENDUM No. 2