

AMENDMENT NO. 5 TO CONTRACT FOR ENGINEERING SERVICES

This Amendment is made and entered into this 13TH day of AUGUST, 2024, by and between the Oklahoma City Water Utilities Trust, a municipal trust, herein called "Trust", and Carollo Engineers, Inc., herein called "Engineer".

WITNESSETH:

WHEREAS, the Trust and the Engineer entered into an agreement on November 21, 2017 as follows:

Project No. WY-0012
Distribution System Nitrification Evaluation; and

WHEREAS, this project provides for the Engineer's design and all other engineering services related to a comprehensive evaluation of the Oklahoma Water Distribution System to assess the possibility of nitrification/water degradation, deliver a nitrification action plan which will provide guidance on prevention and management of nitrification, and estimated costs to implement and maintain the nitrification action plan; and

WHEREAS, the Trust authorized the Engineer to commence with additional services for Desktop Evaluation for Corrosivity, including the collection of additional water quality data during the Baseline Monitoring Plan to evaluate whether a correlation exists between nitrification and corrosivity; and

WHEREAS, the subtask did not include a non-economic and economic evaluation of the current corrosion inhibition method; and

WHEREAS, subsequent to execution of the original contract, the Trust requested the Engineer to develop and execute a training program for its staff with respect to the implementation of the nitrification action plan; and

WHEREAS, additionally, it was determined to be in the best interest of the Trust to direct the Engineer to conduct a multi-level approach to evaluate the effectiveness of the existing corrosion control/inhibitor chemical (zinc orthophosphate), identify and evaluate optional corrosion control/inhibitor chemical(s) based upon economic (Net Present Value) and non-

economic criteria (to be determined during analysis), and provide an Engineering Report with recommendations for the corrosion control chemical(s) based upon effectiveness and cost; and

WHEREAS, the above work was authorized under the auspices of **Amendment No. 1**;
and

WHEREAS, subsequent to execution of the original contract as previously amended and due to travel restrictions associated with the Covid-19 pandemic, the original project schedule was delayed, requiring the Engineer to perform additional services related to the collection of pipe segments and maintaining the integrity of the collected segments; and

WHEREAS, in addition, recent studies conducted by the Federal Aviation Administration (FAA) determined the water quality at the Mike Monroney Aeronautical Center (MMAC) campus may not meet EPA standards for lead and corrosion; and

WHEREAS, therefore, it was determined to be in the best interest of the Trust to direct the Engineer to implement a water quality sampling program at the MMAC campus, review documents provided by the FAA, and summarize results in an Engineering Report; and

WHEREAS, the above work was authorized under the auspices of **Amendment No. 2**;
and

WHEREAS, Amendment No. 1 approved bench scale and pipe morphological testing;
and

WHEREAS, subsequent to execution of the original contract as previously amended and upon completion and review of the bench scale and pipe morphological testing, the Technical Review Committee determined additional testing is required; and

WHEREAS, the additional testing will include but not be limited to 1) silicate dosage to determine effective dose threshold; 2) lead/copper and brass coupon to determine how potential changes made for the magnesium silicate stability may impact lead and copper corrosion; 3); nitrification to determine if the pH shift in the pipe loops can be attributed to nitrification; and 4) distribution solids induced pH shift to determine if a pH shift can be observed in the pipe loops and can be attributed to the presence of solids collected from the distribution system; and

WHEREAS, it has also been determined to extend the pipe loop testing period from 9 months to 12 months to account for seasonal changes; and

WHEREAS, the above work was authorized under the auspices of **Amendment No. 3**;
and

WHEREAS, subsequent to execution of the original contract as previously amended, it was determined to be in the best interest of the Trust to direct the Engineer perform a Nitrification Action Plan (NAP) Effectiveness Evaluation to evaluate the impact of the NAP implementation on distribution system water quality since 2020; and

WHEREAS, as a result of the recently completed Lead Service Line (LSL) desktop study, the Engineer was required to integrate LSL and Premise Plumbing testing into the bench scale and pilot scale corrosion evaluation program; and

WHEREAS, integration included but was not limited to the following: 1) identifying, sampling, and harvesting LSL and premise plumbing; 2) construction of pipe rigs to accommodate harvested LSL for integration into the pilot scale testing protocol; 3) periodic sampling of harvested premise plumbing during pilot testing for integration into the pilot testing protocol; and 4) incorporating the results of the LSL and premise plumbing testing into the overall conclusions and recommendations of the Corrosion Inhibitor Chemical Evaluation; and

WHEREAS, it was also necessary to extend the pipe loop testing period from 12 months to 22 months to accommodate the time necessary to identify, sample, harvest, and assemble the LSL pipe rigs and premise plumbing for integration with the pilot scale testing protocol; and

WHEREAS, additionally, the Technical Review Committee recommended Marble Testing as necessary, to determine solubility and stability of the magnesium silicate in the distribution system under various corrosion control alternative strategies during pilot scale testing; and

WHEREAS, the above work was authorized under the auspices of **Amendment No. 4**;
and

WHEREAS, subsequent to execution of the original contract as previously amended, it has been determined to be in the best interest of the Trust to direct the Engineer to provide characterization of galvanized iron pipe (GIP) for 6 initial sites, including sequential sampling, elemental analysis, and scale solubility testing to confirm the nature of the GIP scale, and scale stability to the current scope to evaluate the Lead Service Line (LSL) and Cast-Iron Pipe (CIP) in the pilot scale pipe loops; and

WHEREAS the Engineer will also assess the GIP wall thickness as an indicator of the risk of pipe failure, provide additional lead service line (LSL) harvesting and evaluation, and project coordination and communication associated with the additional tasks; and

WHEREAS, the original contract must be amended to provide for the Engineer's increased scope of work as outlined above and associated fees; and

WHEREAS, the total compensation to be paid to the Engineer for this Contract and Amendment shall be as follows:

For the original contract:

Not to exceed \$394,430 for engineering services

For Amendment No. 1:

Not to exceed \$1,961,970 for engineering services

For Amendment No. 2:

Not to exceed \$112,830 for engineering services

For Amendment No. 3:

Not to exceed \$506,350 for engineering services

For Amendment No. 4:

Not to exceed \$1,368,480 for engineering services

For Amendment No. 5:

Not to exceed \$412,322 for engineering services

Total Amended Contract:

Not to exceed \$4,756,382 for all services (an increase of \$412,322); and

WHEREAS, both parties agree to amend said contract.

NOW, THEREFORE, the parties agree as follows:

I. Amend **Paragraph 2. Basic Services.** to read as follows:

Basic Services. The Engineer is hereby engaged and employed by the Trust to perform in accordance with good engineering practices and in the best interest of the Trust in accordance with the professional standard of care all of the work as set out herein (including **Amendment No. 1** work related to developing and executing a training program for OCWUT staff with respect to the implementation of the nitrification action plan, conducting a multi-level approach to evaluate the effectiveness of the existing corrosion control/inhibitor chemical, identifying and evaluating optional corrosion control/inhibitor chemical(s) based upon economic and non-economic criteria, and providing an Engineering Report with recommendations for the corrosion control

chemical(s) based upon effectiveness and cost; and **Amendment No. 2** work related to a water quality sampling program at the MMAC campus, review of documents provided by the FAA, and summarization of results in an Engineering Report; and **Amendment No. 3** work related to performing additional bench scale and pipe morphological testing and an additional 3 months of pipe loop testing; and **Amendment No. 4** work related to performing a Nitrification Action Plan (NAP) Effectiveness Evaluation, integrating LSL and Premise Plumbing testing into the bench scale and pilot scale corrosion evaluation program, performing Marble Testing as necessary, and an additional 10 months of pipe loop testing; and **Amendment No. 5** work related to characterization of galvanized iron pipe (GIP) for 6 initial sites, assessing the GIP wall thickness as an indicator of the risk of pipe failure, providing additional lead service line (LSL) harvesting and evaluation, and project coordination and communication associated with the additional tasks); including Exhibit A, and including but not limited to the following:

II. Amend **Paragraph 5. Compensation.** to read as follows:

Compensation. The aggregate total compensation for all engineering services under this Contract shall not exceed a total fee of \$4,756,382 (an increase of \$412,322), which includes: for Basic Services an amount not to exceed \$2,399,681 (an increase of \$300,811) as specifically set forth in Exhibit B, attached hereto and incorporated herein; and, for Additional Services an amount not to exceed \$2,356,701 (an increase of \$111,511), as specifically set forth in Exhibit E, attached hereto and incorporated herein.

III. Amend **EXHIBIT A – SCOPE OF WORK** by addition of the following “**Exhibit A – Scope of Work (added by Amendment No. 5)**”:

**Exhibit A – Scope of Work
(Added by Amendment No. 5)**

Amendment No. 5 to the scope of work involves the following modifications to the Task 1 services associated with WY-0012 to incorporate the following into the basic services for the project:

- Recommended characterization of galvanized iron pipe (GIP), including sequential sampling, elemental analysis, and scale solubility testing to assess the nature of GIP scale and scale stability to correspond to the current scope to evaluate the Lead Service Line (LSL) and Cast Iron Pipe in the pilot scale pipe loops;
- Assessment of GIP wall thickness as an indicator of the potential risk of pipe failure;
- Additional work required for the lead service line (LSL) evaluation; and
- Project coordination and communication associated with the additional tasks.
- A brief background associated with the tasks outlined in this amendment is provided below, followed by a description of the scope of services.

Background – Galvanized Iron Pipe (GIP) Investigation: In response to the Lead and Copper Rule Revisions and the requirement for all public water supplies which have or are suspected to have lead service lines, the City of Oklahoma City (City) has implemented a pilot program to identify the pipe materials on both the utility and customer sides of each water meter. During this investigation, the City has verified that a substantial number of services have galvanized pipes on the customer side of the meter. To ensure this study is comprehensive in its evaluation of all critical pipe materials (cast iron/lead/galvanized iron), the City requested additional testing utilizing available GIP service lines. Since the Technical Review Committee (TRC) recommended against inclusion of the GIP in the pilot scale investigations due to concerns regarding fragility and repeatability of results, these basic services focus on GIP characterization testing to validate scale stability under similar conditions. Attachment A to this Exhibit A provides an explanation letter, summarizing the recommendations by the TRC with respect to GIP testing.

Consequently, the additional basic services to be provided in this study for GIP service line evaluation will include site selection, sequential sampling at the customer's tap, harvesting, elemental analysis to verify the presence of magnesium silicate (MgSi) scale as seen in other areas and types of pipes in the distribution system, and solubility testing. Additionally, sections of the harvested GIP will be tested for pipe wall thickness to assess the risk and susceptibility for failure. A comprehensive approach for the investigation of the conditions of GIP service lines is included in Task 5.1 below.

Background – LSL and Premise Plumbing Evaluation: Task 4.1, as approved in Amendment No. 4, dated March 2, 2023, included tasks for sequential sampling and harvesting at sites identified as having LSLs through the City's pilot program. Six (6) sites were identified, and sequential samples were taken on October 24, 25, 26 and 31, 2023. Those samples were sent to Virginia Tech for analysis which was completed prior to the LSL harvesting which occurred the week of November 14-16, 2023.

During LSL harvesting of the six identified sites, two (2) of the sites were found to not have suitable lead pipes for the study as reviewed by both the City staff and the Engineer. To preserve the pilot scale testing protocol, sequential samples were taken at two additional sites during the same field visit as the harvesting. These samples required additional staff time for sample collection, sampling supplies, shipping containers and costs, and analysis by Virginia Tech.

BASIC SCOPE OF SERVICES

Task 2.1 – Corrosion Inhibitor Chemical Evaluation (Authorized by Amendment No. 1, Amended by Amendments 3 and 4, and additional tasks amended by this request).

Per a request by the General Manager to incorporate Galvanized Iron Pipe investigations into the study, this task will be updated to integrate the GIP testing into the corrosion evaluation program for the project. Consequently, additional project coordination and

communication to complete this task will be required throughout the remaining duration of the project.

Task 2.1.1 Project Coordination and Communication

Task 2.1.1.1 Monthly Progress Status Reports: Amend task description to include additional expanded monthly project status reports to incorporate GIP site selection, sequential sampling, harvesting, and analysis updates.

Task 2.1.1.2 Project Meetings and Workshops: Amend original task to include additional internal coordination and one additional Progress Status Meeting with OCWUT staff related to GIP harvesting and analysis.

Task 2.1.2 Technical Review Committee Coordination: Amend the original task to incorporate additional TRC coordination throughout the implementation of the GIP site selection, sequential sampling, harvesting, and analysis phases.

Task 2.1.6 Draft and Final Engineering Report: Task 2.1.6 will be amended to incorporate the following into the engineering report:

- Task 5.1.2 Sequential WQ Sampling at GIP sites
- Task 5.1.4 Harvested GIP Scale Analysis (Elemental)
- Task 5.1.5 Harvested GIP Scale Analysis (Solubility) Task 5.1.6 Harvest GIP – Pipe Thickness Analysis

Task 4.1 LSL and Premise Plumbing Evaluation (Authorized by Amendment 4 and additional tasks amended by this request)

Purpose: To authorize basic services for additional harvesting of Lead Service Lines (LSL) as described in the background above.

As defined in Amendment 4, the Engineer conducted the following on two additional sites:

Task 4.1.1 Harvest LSL for Pipe Scale Analysis

- Purpose: Determine extent of Magnesium Silicate (MgSi) present in pipe and presence of zinc (Zn) on pipe due to current Zinc Orthophosphate corrosion inhibition strategy and inform testing conditions for LSL pipe rig testing.
- Additional costs incurred due to LSL harvesting at two additional sites.

Task 4.1.2 Sequential LSL WQ Sampling

- Purpose: Collect samples to determine potential source of lead (LSL, lead solder, brass fittings) at customer tap under current corrosion control optimization and plant operations.
- Sequential sampling for two additional sites includes:
 - Provide bottle kits, labels, data collection forms, chain of custody forms, and gloves for sample collection.

- Provide remote support to Trust staff during sampling.
- Conduct on-site field analysis of 1st and last samples collected.
- Package and ship Water Quality samples for analysis.

Task 5.1 GIP Evaluation (Added by Amendment No. 5)

This task will include the characterization testing of GIP into the corrosion evaluation program for the project. The goal is to identify, harvest, and characterize GIP from nine (9) sites, three each from each of the three major Water Quality (WQ) zones (Hefner, Draper, and Blend). Since it is not yet known whether that many sites will be identified, the scope and fee split the work into six (6) sites covered under Basic Services, and three (3) sites under Additional Services to be authorized if more than six (6) sites are identified for testing. Engineer recommends prioritizing identification of at least one to two sites per blend zones, even if a full three sites cannot be identified per zone.

The Engineer shall conduct the following:

Task 5.1.1 GIP Site Selection and Harvesting Protocol

- Purpose: Establish a site selection and harvesting protocol in conjunction with the OCWUT Water Quality and Line Maintenance staff which will provide safe and effective harvesting of GIP services line on the utility side while protecting the customer side.
- Evaluation will include:
 - Update the Pipe Harvesting protocol utilized for LSL sites to include:
 - GIP site selection and screening.
 - GIP pipe harvesting, handling, storage, transportation, and shipping protocol.

Task 5.1.2 Sequential Sampling for WQ at GIP Sites (6 sites)

- Purpose: Collect samples to determine potential impact of lead or other metallic components on GIP service lines at the customer tap under current water quality and corrosion control conditions.
- Evaluation will include:
 - Update the Sequential Sampling protocol utilized for LSL sites to include:
 - GIP site selection and screening.
 - GIP sample collection and handling procedures.
 - Provide bottle kits, labels, data collection forms, chain of custody forms, and gloves for sample collection.
 - Provide support to City staff during sampling.
 - Conduct on-site field water quality tests on up to 2 samples at each site to verify pH, conductivity, total chlorine, monochloramine, free ammonia, and nitrite levels.
 - Ship samples for additional water quality and metals analysis.
 - Analysis and evaluation of findings will be added to the draft and final engineering report, as described in Task 2.1.6.

- Assumptions:
 - City to utilize protocol to identify sampling locations, perform screening, and lead sequential sampling at selected customer homes.
 - City to obtain right of entry to homes.
 - City to collect samples according to protocol at six (6) homes under this Basic Services task.
 - Same location(s) will be utilized for GIP harvesting and sequential sampling.
 - WQ analyses will be performed by subconsultant laboratory (Virginia Tech).

Task 5.1.3 GIP Field Work – Harvesting (6 sites)

- Purpose: Harvest in-situ GIP service lines to be used for elemental analysis, scale solubility, and pipe thickness analysis.
- Evaluation will include:
 - Coordinate with the City staff for sites and scheduling of pipe harvesting.
 - Provide onsite assistance during GIP pipe harvesting. Prepare (cut/package) and ship pipe segments provided by the City to Corrosion Probe, Inc. for elemental analysis under Task 5.1.4 and pipe thickness analysis under Task 5.1.6, and to Water ARC® for solubility analysis under Task 5.1.5.
- Assumptions:
 - City to utilize Engineer's protocol from Task 5.1.1 to identify and harvest potential GIP harvest sites.
 - City to harvest six (6) GIP service lines under Basic Services.

Task 5.1.4 Harvested GIP Pipe Scale Analysis (Elemental Analysis - 6 sites)

- Purpose: Determine extent of Magnesium Silicate (MgSi) scale present in pipe and presence of zinc (Zn) on pipe due to current Zinc Orthophosphate corrosion inhibition strategy.
- Evaluation will include:
 - Elemental analysis will be performed on the interior of up to 18 sections of GIP pipe (three sections per six sites, with any additional sites covered under Additional Services). Methods will include XRD and SEM (X-ray diffraction and scanning electron microscopy).
 - Analysis and evaluation of findings will be added to the draft and final engineering report, as described in Task 2.1.6.
- Assumptions
 - Elemental analysis will be performed by subconsultant laboratory (Corrosion Probe, Inc.).

Task 5.1.5 Harvested GIP Pipe Scale Analysis (Bench Scale Solubility Testing Analysis – 6 sites)

- Purpose: Evaluate the scale stability of the GIP under various pH conditions to determine the optimum pH to maintain the scale, and compare with the optimum pH

previously determined for scales in cast iron pipes under similar bench scale conditions.

- Evaluation will include:
 - Shipment of harvested GIP segments, and Hefner and Draper waters to Engineer's Water ARC® laboratory for analysis.
 - Removal of scales from GIP pipes and preparation of scale samples for the solubility evaluation.
 - Preparation of Hefner, Draper, and Blend waters to meet their distribution system WQ under multiple pH conditions.
 - Mixing the scale samples with the prepared testing waters.
 - Analysis of the samples at different times after mixing starts, and shipment of the samples to Virginia Tech for dissolved metal analysis to determine the amount of scale dissolved or precipitated in the prepared scale samples mixed with testing waters.
 - Analysis of the optimum pH condition to stabilize the scale based on the dissolved metal analysis results, and comparison of the optimum pH conditions for GIP scales and cast-iron pipe scales previously conducted under this study.
 - Analysis and evaluation of findings will be added to the draft and final engineering report, as described in Task 2.1.6.
 - Elemental Analysis of up to 3 composite scale samples to confirm composition of the scale used for solubility analysis.
- Assumptions
 - A maximum of eight (8) pH conditions will be tested for Hefner, Draper, and Blend waters, respectively.
 - A maximum of five (5) samples at different time points will be taken from the start of the testing for dissolved metal analysis under each pH condition to evaluate the kinetics of scale dissolution/precipitation. The last time point will be no longer than 168 hours (7 days).

Task 5.1.6 Harvested GIP Pipe – Pipe Thickness Analysis (6 sites)

- Purpose: Evaluate the susceptibility of the GIP to failure based on an analysis of pipe wall thickness, and comparison to pipe manufacturing data tables and predicted system pressure ranges established from the City's hydraulic model.
- Evaluation will include:
 - Shipment of harvested GIP segments to Corrosion Probe, Inc. for analysis.
 - Measurement of the internal and outer diameter of the pipe, and calculation of the thickness.
 - Comparison of pipe thickness to standards.
 - Assessment of failure risk based on current and potential future system pressures from the City's hydraulic model.
 - Analysis of potential modes of failure. For example, external soil corrosion versus internal corrosion.
 - Analysis and evaluation of findings will be added to the draft and final engineering report, as described in Task 2.1.6.

IV. Amend **EXHIBIT B – COMPENSATION** to read as follows:

**EXHIBIT B
COMPENSATION
PROJECT NO. WY-0012
DISTRIBUTION SYSTEM NITRIFICATION EVALUATION**

Under the terms of this Contract, the Engineer agrees to perform the work and services described in this Contract. The Trust agrees, in accordance with the limitations and conditions set forth in the Contract, to pay an amount not to exceed \$4,756,382 (an increase of \$412,322) which includes: for Basic Services an amount not to exceed \$2,399,681 (an increase of \$300,811) as specifically set forth in this Exhibit B; and, for Additional Services an amount not to exceed \$2,356,701 (an increase of \$111,511), as specifically set forth in Exhibit E.

B.I. Basic Work and Services

Compensation for basic services may not exceed \$2,399,681 (an increase of \$300,811), and in no event may the Engineer receive compensation in excess of the amount listed for each task for performance of its basic services.

The Engineer may receive up to the following amounts of the not to exceed amounts for services rendered upon the completion of the following tasks. Partial payments of the not to exceed amounts for each task may be invoiced for incremental work completed. Not to exceed amounts below are accumulative for successive tasks.

Task 1 an amount not to exceed:

Engineering Report Services

Task 1.1 Project Delivery and Communications	\$71,910
Task 1.2 Nitrification Action Plan	\$155,080
Total:	\$226,990

The following Tasks and Fees were added by Amendment No. 1:

Task 1.3 - OCWUT Staff Training	\$28,010
Task 2.1 - Corrosion Inhibitor Chemical Evaluation	\$832,500 (an increase of \$102,820)
Task 3.1 – FAA Water Age and Corrosion Inhibition Analysis	\$41,530
Total:	\$902,040

The following Tasks and Fees were added by Amendment No. 2:

Task 2.2 – Maintenance and Monitoring of Harvested Pipe	\$13,030
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Task 2.3 – Distribution System Solids Analysis	\$25,850
Task 3.2 – FAA/MMAC Water Quality Report Peer Review	\$29,890
Task 3.3 – MMAC Distribution Water Quality Sampling Plan& Summary	\$28,850
Total:	\$97,620

The following Tasks and Fees were added by Amendment No. 4:

Task 1.4 – Nitrification Action Plan Effectiveness Evaluation	\$48,040
Task 4.1 – Lead Service Line and Premise Plumbing Evaluation	\$949,850
	(an increase of \$22,850)
Total	\$997,890

The following Tasks and Fees were added by Amendment No. 5:

Task 5.1 – Galvanized Iron Pipe (GIP) Evaluation (6 initial sites)	\$175,141
Total	\$175,141

V. Amend **EXHIBIT E – ADDITIONAL SERVICES** to read as follows:

**EXHIBIT E
ADDITIONAL SERVICES
PROJECT NO. WY-0012
DISTRIBUTION SYSTEM NITRIFICATION EVALUATION**

Additional Services shall only be provided upon prior written and clearly detailed direction of the General Manager. The Engineer may be directed to perform any, all or none of the following Additional Services that may include, but not be limited to, the following:

- Task 6.1 - Desktop Evaluation for Corrosivity - \$68,700
- Task 6.2 - Temperature Monitoring in Selected Water Storage Tanks - \$48,740
- Task 6.3 - Water Quality Sampling and Analysis at Additional Sites – 10 at \$5,000 per unit - \$50,000
- Task 6.4 – Pipe Loop Study (added by Amendment No. 1) - \$2,057,250
- Task 6.5 – Marble Testing (added by Amendment No. 3) - \$20,500
- Task 5.1 – GP Evaluation for 3 additional sites (added by Amendment No. 5) **\$91,511 (an increase of \$91,511)**
- Task AS.1 – Items necessary for completion of the project (added by Amendment No. 5) **\$20,000 (an increase of \$20,000)**

SCOPE OF WORK FOR EXHIBIT E - ADDITIONAL SERVICES

Task 6.1 - Desktop Evaluation for Corrosivity

General

Nitrification in the distribution system can be an indicator of other water quality problems within the distribution system. Evaluation of the distribution system water quality with respect to corrosivity is recommended to verify compliance with the Lead and Copper Rule. Based on the finished water quality goals, the Engineer will develop a desktop evaluation to assess the corrosivity of the finished water in the distribution system.

This evaluation will be based on water quality goals and water quality data of the finished water. Water quality data will include, but not be limited to, pH, alkalinity, temperature, turbidity, calcium, total hardness, chloride, sulfate, nitrite, nitrate, oxidation reduction potential (ORP), total dissolved solids (TDS), conductivity, orthophosphate, total phosphate, free ammonia, and disinfectant residuals.

Deliverables

Major deliverables associated with Task 6.1 are as follows:

TASK 6.1.1 - Corrosion Evaluation

Utilizing information of the estimate of the types and quantity of different pipe materials in the distribution system, water quality data, corrosion coupon data and other corrosion testing results, the Engineer will conduct a desktop analysis to estimate the corrosion/scaling potential in the distribution system. The Baseline Monitoring Plan, implemented as part of the development of the NAP, will include specific corrosion indicators to be monitored during the twelve-month period. This will provide additional data to further define if a correlation exists between nitrification and corrosivity.

TASK 6.1.2 - Report

The Engineer will develop summary of findings from Task 6.1.1 with results from the desktop corrosion evaluation and provide recommendations for optimizing distribution water quality with respect to corrosivity. The summary of findings will be included as an appendix to the NAP.

Assumptions

The following assumptions were utilized in preparing this scope of services:

- 1) This subtask does not include the extraction of physical pipe segments for evaluation of corrosion and/or microbial growth.
- 2) This subtask is an evaluation of the existing system and water quality only. It will provide general recommendations, but does not include design services for changes to water treatment or distribution system modifications.
- 3) This subtask does not include an evaluation of the utilization or effectiveness of corrosion inhibitors.

Task 6.2 - Temperature Monitoring in Selected Water Storage Tanks

General

One contributing factor to nitrification can be thermal water stratification in elevated storage tanks (ESTs), especially if the water remains in the tanks for more than 3 days. Temperature data loggers will be installed in up to two (2) elevated storage tanks to monitor the water temperature at various levels in the tanks. The tank(s) will be selected based upon information gathered during the baseline monitoring and discussions with Trust staff.

Deliverables

Major deliverables associated with Task 6.2 are as follows:

TASK 6.2.1 - Coordination and Mobilization

The Engineer will provide owner with a list of parts needed for the temperature data logger equipment. The Engineer will assemble up to two (2) sets of temperature data logger equipment and coordinate with the Trust for their installation in the selected ESTs. The assembly will include up to seven self-contained temperature data loggers to be installed at various water levels in these ESTs. The Trust will provide the Engineer access to the tank(s). This includes the use of safety equipment needed to install the data logger.

TASK 6.2.2 - Data Logger Checks and Data Analysis

After mobilization, the Engineer will check temperature data loggers in both ESTs up to three (3) times. The final check will include removal of the data loggers. Data collected from the data loggers will be organized in an Excel spreadsheet for evaluation and reporting by the Engineer.

TASK 6.2.3 - Meetings and Reporting

Subtask 6.2.3.1 - Quarterly Progress Reports:

The Engineer will provide graphs and brief summaries of data collected to date for up to two (2) quarterly progress reports. These will be submitted after the second and third data logger checks and in conjunction with monthly progress status reports defined in Task 1.1.2.

Subtask 6.2.3.2 - Report:

The Engineer will develop summary of findings from Tasks 6.3.1 and 6.3.2. The summary of findings will be included as an appendix to the NAP.

Assumptions

The following assumptions were utilized in preparing this scope of services:

1. All parts and equipment needed for the temperature data loggers will be purchased by the Trust and provided to Engineer for assembly. Estimated cost is \$3,500.
2. Tanks(s) identified for temperature monitoring will be selected based upon water quality data and discussions with Trust staff. Task may be limited to only one tank, or no tanks, if water quality data does not support temperature monitoring.

Task 6.3 - Water Quality Sampling and Analysis at Additional Sites

General

Upon review and approval by the Trust, the Engineer may be responsible for collection and analysis for the water quality parameters at up to ten (10) additional sites. These sites will be defined as sites that are currently not sampled by Trust staff as part of their routine monitoring of distribution system water quality.

Deliverables

Major deliverables associated with Task 6.3 are as follows:

TASK 6.3.1 - Sample Collection and Analysis

Utilizing Baseline Monitoring Plan (BMP) (Subtask 1.2.1.4) and Desktop Evaluation for Corrosivity (Task 6.1), the Engineer will collect necessary samples from the additional sites and conduct field analysis or transport to a Trust approved laboratory for analysis. The Engineer and Trust will establish sampling locations, as defined previously in Subtask 1.2.1.3.

Assumptions

The following assumptions were utilized in preparing this scope of services:

1. The Trust and the Engineer to determine additional sampling sites as part of the baseline monitoring plan established as part of the work included in Task 1.2.1.3. No sampling by either party for purpose of this study is anticipated prior to the Project Initiation Meeting.
2. Estimated unit costs for this task assumes the water quality samples and frequency of collection at these additional sites will be in accordance with Attachment C.
3. Estimated unit costs for this task assumes a maximum number of ten (10) sites.
4. The Engineer will provide necessary field equipment for on-site water quality sampling at the additional sites. The Trust will be responsible for providing all equipment for the existing sites.
5. The Engineer will coordinate with ODEQ approved laboratory for analysis of parameters which cannot be analyzed via field equipment. The Trust will pay for all analytical costs from the ODEQ approved laboratory.

6. The Engineer will be responsible for collection, storage, and payment of shipping costs to transport the samples to the laboratory.
7. Field and laboratory analysis will utilize ODEQ and EPA approved methods.
8. The Trust will provide necessary access to sampling locations via map(s), keys, and/or staff members, as needed.

SCOPE OF WORK FOR EXHIBIT E-ADDITIONAL SERVICES
(ADDED BY AMENDMENT NO. 1)

Task 6.4 - Pipe Loop Study

General

Upon recommendation by the TRC within Task 2.1, a pipe loop study will be required to examine the effectiveness of the recommended corrosion inhibitor and confirm the validity of the economic and non-economic analysis. Services under Task 6.4 will be an Additional Service and must be authorized by the General Manager.

The overall goals of this task are to:

1. Design, construct, and operate up to four (4) pipe loop test assemblies utilizing selected pipe segments from the Oklahoma City distribution system to evaluate existing and potential corrosion inhibitor chemicals. There will be two (2) pipe loop assemblies constructed at each of the Draper and Hefner Water Treatment Plants.
2. Update the economic and non-economic evaluation conducted in Task 2.1 with the results of the pipe loop study. Prepare the Draft Engineering Report including the information from the Technical Memorandum completed in Task 2.1 and provide recommendations for the types of and implementation method for corrosion inhibitor chemical(s).

Assumptions

Assumptions associated with Task 6.4 are listed below:

- 1) Pipe Loop Study design and protocol will be reviewed and approved by the Technical Review Committee prior to purchase or construction of equipment.
- 2) A maximum of four (4) pipe loop assemblies will be designed, constructed, and operated. Two (2) will be located at the Hefner WTP and two (2) will be located at the Draper WTP. The pipe loop assemblies will be constructed based upon a maximum of four-inch pipe sampled from the Oklahoma City distribution system.
- 3) Finished water supply, without addition of corrosion inhibitors, will be required for each pipe loop assembly location.

- 4) Trust staff will be responsible for the collection and transport of finished water from the Hefner WTP to the Draper WTP for the testing of a blended supply. It is anticipated that a maximum of 500 gallons would be needed on a weekly basis for approximately twelve (12) weeks.
- 5) Engineer will be responsible for design, construction and operation of pipe loop study as outlined below, including the pipe loop assemblies, supply and discharge piping. Trust staff will be utilized to assist with selection of location for pipe loop assemblies, piping and electrical connections. Additionally, Engineer staff will operate the pipe loop facilities 5 days per week. Trust staff will be utilized to collect samples on weekends, if needed. See responsibility matrix provided in Attachment A.

Deliverables:

Major Deliverables associated with the Pipe Loop Study (Task 6.4) are as follows:

1. Additional Monthly Progress Reports
2. Monthly Updates to Action/Decision Logs
3. Meeting Minutes and Agendas
4. Draft Pipe Loop Testing Protocol – One (1) months after Notice to Proceed (NTP).
5. Final Pipe Loop Testing Protocol – One (1) month after receipt of comments from OCWUT.
6. Drawings and Specifications associated with Pipe Loop Installation – Two (2) month after approval of Pipe Loop Testing Protocol
7. Installation of Pipe Loop – Six (6) months following Drawings and Specifications
Start of Pipe Loop Testing – Four (9) months after NTP
8. Completion of Pipe Loop Testing – Twenty-Two (19) months after NTP [10 months of testing]
9. Draft Engineering Report – Twenty-Two (22) months after NTP
10. Final Engineering Report – One (1) month after receipt of comments from OCWUT

Task 6.4.1 - Pipe Loop Testing Protocol:

Engineer will be responsible for the development of a Draft and Final Pipe Loop testing protocol document containing the following:

- Introduction and Purpose
- Roles and Responsibilities
- Pipe Loop Assembly Design and Installation
 - o Design Criteria
 - o Location and arrangement of Pipe Loops
 - Hefner WTP
 - Draper WTP
 - o Bill of Materials
 - o Mechanical Installation Requirements

- Electrical Installation Requirements
- Pipe Loop Assembly Operation
- Pipe Loop Assembly Troubleshooting
- Sampling and Analysis Protocol
 - Engineer Responsibilities
 - Trust Responsibilities

Task 6.4.2: Design of Pipe Loop Assemblies:

The Engineer will be responsible for the design of the pipe loop assemblies and the associated utilities (electrical, water supply, drain, etc.). Sufficient space is available and allowed for use at the Hefner WTP and Draper WTP for the pipe loop assemblies and that modification of this space or additional facility construction will not be required to accommodate the space requirements of the pipe loop assemblies. This space will be selected for proximity to pipe loop required utilities:

- Conditioned Climate
- Source of finished water supply
- Electrical 120v, 1, 60 Hz supply
- Process Drain

Trust staff will provide as-built drawings of existing facilities to determine internal dimensions and potential obstructions within these facilities. The Engineer will provide fabrication and installation drawings for the pipe loop assemblies and oversee installation of pipe loop assemblies testing equipment in the pilot facility.

Task 6.4.3 - Pipe Loop Assembly Installation and Commissioning:

Attachment A includes a responsibility matrix for the installation and commissioning of the pipe loop assemblies at the Hefner and Draper WTPs. Engineer will coordinate schedule of pilot testing equipment delivery with the Trust. The Trust will provide appropriate personnel and equipment to assist with the installation and commissioning of the pipe loop facilities in accordance with Attachment A.

- The Engineer will provide up to four (4) pipe loop assemblies (approximately 200 gpm flowrate) for the selected processes and deliver them to the site. Pipe loop assemblies will include all tanks, piping, pumps, sampling points and on-line sampling equipment necessary to conduct the project.
- The Engineer will coordinate with the Trust to identify six (6) corroded metallic pipe segments from their distribution system. The Trust will be responsible for the design to remove ductile iron pipe segment and replace with repair sleeve. Approximate dimensions for pipe segments will be up to 12 feet long with a 4-inch diameter. Engineer will coordinate with Trust to assemble up to four (4) of these pipe segments in a pipe loop assembly for testing.
- The Trust will furnish current corrosion inhibitor chemicals to be used during the course of the testing. Engineer will obtain additional corrosion inhibitor chemicals,

as recommended by the Corrosion Inhibitor Chemical Evaluation identified in Task 2.1, as necessary for the pipe loop testing.

- The Engineer will furnish and install plumbing within the pipe loop facility from the finished water source to the pipe loop unit and from the pipe loop unit to the on-site waste discharge system, through the use of a licensed contractor.
- The Engineer will furnish and install drain piping for disposal of treated water from pipe loop study through the use of a licensed contractor.

Payment for installation of the pipe loop assemblies and appurtenances shall be based on actual costs accrued by the Engineer with standard industry markup of ten percent for oversight and management of the work.

Task 6.4.3 - Pipe Loop Operation and Troubleshooting

The Engineer will be responsible for operating and troubleshooting the pipe loop test equipment and conduct all laboratory analytical testing required by the study protocol. Attend the pilot plant and/or provide appropriate automation in order to collect the data required by the pilot protocol. Laboratory analytical testing assumes four (4) pipe loops will be tested. Engineer anticipates that part-time staffing (four hours per day, five days per week) of the pilot equipment will be required to maintain operations and collect the data required for the project. The Trust will provide personnel to collect operational data on the weekends, if needed.

The Engineer's field personnel will keep field logs of daily operations of the pipe loop facility for the duration of the pipe loop study. Field logs will identify all maintenance activities, changes in pipe loop operating parameters, site testing, deviations from the test protocol with approval, and notes and observations of site personnel.

During the course of the pipe loop study, the Engineer will provide data interpretation and issue weekly progress reports by email to the project team. These reports will identify issues that may delay the study or compromise the study's ability to meet the project's goals, and provide the project team a means to offer solutions toward keeping the project on track. The Engineer will schedule semi-monthly conference calls with the Trust to review the weekly reports.

Task 6.4.4 - Corrosion Inhibitor Evaluation

The Engineer will evaluate the effectiveness of different corrosion inhibitor chemicals through targeted water quality sampling of finished water utilized for the pipe loop study and treated water using selected corrosion inhibitor chemicals. Water quality parameters will include stability, corrosivity, metals, and other related corrosion indicators.

Task 6.4.5 - Pipe Loop Disassembly and Demobilization

The Engineer will disassemble and remove all pipe loop study equipment, plumbing, and appurtenant facilities from the pipe loop site(s). The Trust will provide appropriate personnel and equipment to assist the Engineer with disassembly and demobilization of

the pipe loop facilities. The Engineer will be responsible for disposal of all test residuals in a safe and legal manner.

Task 6.4.6 - Site Clean-Up

After removing the pipe loop equipment and plumbing, the Engineer will be responsible for the clean up the site(s) to a condition acceptable to the Trust. The Trust will assist the Engineer in this site clean-up.

Task 6.4.7 - Update Engineering Report with Pipe Loop Information

Once the pipe loop study is complete, the Draft Engineering Report will be prepared and will include work completed under Task 2.1 and included within the Technical Memorandum and the results of the pipe loop study. The implementation protocol, sampling results, drawings, specification, and other information relevant to the execution of the pipe loop study will be included as an appendix to the Engineering Report.

SCOPE OF WORK FOR EXHIBIT E-ADDITIONAL SERVICES **(ADDED BY AMENDMENT NO. 3)**

Task 6.1 Desktop Evaluation: Amendment No. 1 included task 6.1 as additional services, Exhibit E. This amendment modifies the desktop evaluation to include the following:

Task 6.1.1 Desktop Study to evaluate source of Magnesium Silicate

- Based on authorization of Trust staff and management.
- Purpose: evaluate potential sources of magnesium and silicate entering into the distribution system.
- Field sampling at the Hefner and Draper WTPs.
- Samples to be sent to a contract lab for analysis of magnesium, silica, calcium carbonate.
- Analysis and evaluation will be added to the Draft and Final Engineering Report, as described in Task 2.1.6

Task 6.4 Pipe Loop Study:

The pipe loop study task was included in Amendment No. 1 as additional services, Exhibit E. The authorization to include this additional services task in the scope of work was provided by the General Manager. This amendment modifies the Task 6.4, pipe loop study, to extend the testing duration by an additional three months. The following subtasks are impacted by the extension of the testing duration and additional bench scale testing:

Subtask 6.4.3 Pipe Loop Operations and Maintenance

- Based on authorization of Trust staff and management.
- Purpose: Extend from nine (9) months to twelve (12) months to capture full seasonal variations of raw water quality.
- Additional staff time for operation and maintenance of three (3) pipe loops, including repairs during the extended pipe loop testing.

- Additional costs for operation and maintenance of three (3) pipe loops, including replacement parts and consumables used for on-site water quality adjustments and testing for the extended pipe loop testing.
- Additional costs to replace equipment damaged as a result of Filter Gallery flooding event at the Hefner WTP on March 15, 2022.
- Assumptions: The Trust will provide Zinc Orthophosphate and Liquid Ammonia Solution from existing bulk storage systems at either plant; The Engineer will procure and feed other chemicals necessary for pipe loop testing.

SCOPE OF WORK FOR EXHIBIT E-ADDITIONAL SERVICES
(ADDED BY AMENDMENT NO. 4)

Task 6.4.8 Cast Iron Pipe Loop Testing Maintenance Mode Extension (New Task added by this Amendment.)

- The Cast Iron Pipe Loop Study (Task 6.4) was included in Amendment No. 1 as additional services, Exhibit E. The authorization to include this additional services task in the scope of work was provided by the General Manager.
- Task 6.4 was modified by Amendment No. 3 to extend the testing duration for the Cast Iron Pipe Loop by an additional three (3) months to a total of twelve (12) months. Authorization for inclusion of this extended testing duration in the scope of services was provided by the General Manager.
- Task 6.4.3 is necessary to continue operations of the Cast Iron Pipe Loops in maintenance mode while LSL evaluations are conducted to allow for concurrent LSL pipe rig and CI Pipe Loop testing. This was recommended by the TRC to confirm that 1) a proper testing protocol was developed to encompass both the water quality (Cast Iron) and regulatory aspect (LSL/premise plumbing) of any change in corrosion control strategy and 2) allow parallel development and assessment of both the cast iron pipe loops and LSL in tests involving changing water sources (Draper/Hefner/Blend) simulating potential distribution system changes brought on by the Interconnecting pipelines between the Draper and Hefner water treatment plants.
- Testing will include:
 - 10-month continuation of CI Pipe Loop in maintenance mode.
- Assumptions:
 - Ten (10) month extension: October 2022 – August 2023.
 - LSL Pipe Rigs must be onsite and operational prior to the LSL harvesting. Estimated six (6) months period for fabrication and delivery to the sites.
 - CI Pipe Loop and LSL Pipe Rig testing to be conducted concurrently in accordance with the TRC recommendations.
 - City harvesting of LSL pipes and delivery to constructed pipe rigs must be completed within one (1) month of the engineer installation of the pipe rigs at Draper and Hefner WTP. Harvesting may not be completed prior to pipe rig installation.
 - Any delays experienced in the harvesting of LSL pipes (by City) will cause extension of the pipe rig installation, necessitating further extension of the operation of the Cast Iron Pipe Loops in maintenance mode (see Task 6.4.8). We

have based this scope/fee on the assumption that the Cast Iron Pipe Loops will be operated in maintenance mode for a duration of 10 months while LSL and Premise plumbing harvesting and Sequential Sampling is conducted. Additional services beyond those established in this Task (6.4.8), may be required if continued operation of the Cast Iron Pipe Loops in maintenance mode beyond this duration is necessary due to no fault of the Engineer.

Task 6.5 Marble Testing

- Recommended by Technical Review Committee.
- Purpose: Determine solubility/stability of MgSi under various corrosion control alternative strategies.
- Testing will include:
 - Up to ten (10) tests.
 - Analysis and evaluation will be added to the Draft and Final Engineering Report, as described in Task 2.1.6.
- Assumptions
 - To be completed as needed on time and materials basis.

SCOPE OF WORK FOR EXHIBIT E-ADDITIONAL SERVICES **(ADDED BY AMENDMENT NO. 5)**

Task 5.1 GIP Evaluation (Three additional sites)

Purpose: To ensure that additional GIP evaluations can be completed efficiently if sites are located which are acceptable to both the City and Engineer. This will include up to three additional sites.

Task 5.1.1 GIP Site Selection (Additional 3 Sites)

- Purpose: Engineer coordination with City staff to select up to three (3) additional GIP sites.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.1 above.

Task 5.1.2 Sequential Sampling for WQ at GIP Sites (Additional 3 sites)

- Purpose: Conduct sequential sampling at a maximum of three (3) additional sites to determine potential impact of lead or other metallic components on GIP service lines at the customer tap under current water quality and corrosion control conditions.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.2 above.

Task 5.1.3 GIP Field Work – Harvesting (Additional 3 sites)

- Purpose: Harvest in-situ GIP service lines at a maximum of three (3) additional sites to be used for elemental analysis, scale solubility, and pipe thickness analysis.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.3 above.

Task 5.1.4 Harvested GIP Pipe Scale Analysis (Elemental Analysis - Additional 3 sites)

- Purpose: Determine extent of Magnesium Silicate (MgSi) scale present in pipe and presence of zinc (Zn) on pipe due to current Zinc Orthophosphate corrosion inhibition strategy at a maximum of three (3) additional sites.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.4 above.

Task 5.1.5 Harvested GIP Pipe Scale Analysis (Bench Scale Solubility Testing Analysis - Additional 3 sites)

- Purpose: Evaluate the scale stability of a maximum of three (3) GIP sites under various pH conditions to determine the optimum pH to maintain the scale, and compare with the optimum pH previously determined for scales in cast iron pipes under similar bench scale conditions.
- Basic Services Task 5.1.5 includes bench scale laboratory setup. This additional services task includes labor, supplies, consumables, and additional sample analysis for the three (3) additional sites.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.5 above.

Task 5.1.6 Harvested GIP Pipe – Pipe Thickness Analysis (Additional 3 sites)

- Purpose: Evaluate the susceptibility of the GIP to failure based on an analysis of pipe wall thickness, and comparison to pipe manufacturing data tables and predicted system pressure ranges established from the City's hydraulic model by examining and testing a maximum of three (3) additional sites.
- Task evaluation parameters and assumptions are defined in Basic Services Task 5.1.6 above.

Compensation for Additional Services: Included in the not to exceed total compensation is an allowance for Additional Services in an amount not to exceed \$2,356,701 (an increase of \$111,511). This allowance is to be used and paid to the Engineer in the manner established in this Contract, unless other compensation means are agreed to in writing by the General Manager. The Additional Services compensation may only be used after the Engineer has performed Additional Services upon prior written authorization by the General Manager. Invoices submitted for Additional Services shall represent only hours actually worked on this project by the Engineer's employees and the Engineer's consultant's employees and shall be accounted for separately for each Additional Service performed.

[The remainder of this page intentionally left blank.]

IT IS UNDERSTOOD AND AGREED BY AND BETWEEN the Trust and the Engineer that, as amended by this Instrument, all terms and conditions of the original Contract shall remain in full force and effect and the provisions of this Instrument shall become a part of the original Contract as if fully written herein.

IN WITNESS WHEREOF, this Amendment was executed and approved by the Engineer this 19th day of June, 2024.

CAROLLO ENGINEERS, INC.

Thomas O. Crowley, P.E.

Vice President

ATTEST:

STATE OF OKLAHOMA)

SS

COUNTY OF OKLAHOMA)

Brian D. Clow

Vice President

This instrument was acknowledged before me on this 19th day of June, 2024, by Thomas O. Crowley, P.E., as Vice President of Carollo Engineers, Inc. and Brian D. Clow, P.E., as Vice President of Carollo Engineers, Inc.

[Signature]
Notary Public

My Commission Expires/Commission Number:

April 12, 2026 / 22005133



IN WITNESS WHEREOF, this Amendment was approved and executed by the Oklahoma City Water Utilities Trust this 13TH day of AUGUST, 2024

THE OKLAHOMA CITY WATER UTILITIES TRUST

ATTEST:

Amy K. Simpson
Secretary



[Signature]
Chairman

REVIEWED for form and legality.

Craig Keith
Assistant Municipal Counselor

CONCURRED by the City of Oklahoma City this 27TH day of AUGUST,
2024

ATTEST:

Amy K. Simpson
City Clerk



David Holt
Mayor



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

7/4/2025

7/1/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lockton Companies 444 W. 47th Street, Suite 900 Kansas City MO 64112-1906 (816) 960-9000 kcasu@lockton.com	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A : Zurich American Insurance Company	
	INSURER B : Allied World Surplus Lines Insurance Company	
INSURED 1472613 CAROLLO ENGINEERS, INC. 2795 MITCHELL DR. WALNUT CREEK CA 94598-1601	NAIC #	
	16535	
	24319	
INSURER C :		
INSURER D :		
INSURER E :		
INSURER F :		

COVERAGES CERTIFICATE NUMBER: 20681212 REVISION NUMBER: XXXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC <input type="checkbox"/> OTHER:	Y	Y	GLO 9730569	7/4/2024	7/4/2025 EACH OCCURRENCE \$ 2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 2,000,000 MED EXP (Any one person) \$ 25,000 PERSONAL & ADV INJURY \$ 2,000,000 GENERAL AGGREGATE \$ 4,000,000 PRODUCTS - COMP/OP AGG \$ 4,000,000 \$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	Y	Y	BAP 9730571	7/4/2024	7/4/2025 COMBINED SINGLE LIMIT (Ea accident) \$ 2,000,000 BODILY INJURY (Per person) \$ XXXXXXXX BODILY INJURY (Per accident) \$ XXXXXXXX PROPERTY DAMAGE (Per accident) \$ XXXXXXXX DED: COMP/COLL \$ 1,000
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input type="checkbox"/> RETENTION \$			NOT APPLICABLE		EACH OCCURRENCE \$ XXXXXXXX AGGREGATE \$ XXXXXXXX \$ XXXXXXXX
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input checked="" type="checkbox"/> N	N	WC 9730570	7/4/2024	7/4/2025 <input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
B	PROFESSIONAL LIABILITY FULL PRIOR ACTS	N	N	0313-9010	7/4/2024	7/4/2025 EACH CLAIM: \$1,000,000; AGGREGATE: \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Project No. WY-0012 - Distribution System Nitrification Evaluation. City of Oklahoma City and the Oklahoma City Water Utilities Trust are additional insureds as respects general liability and auto liability, and these coverages are primary and non-contributory, as required by written contract. (SEE ATTACHED.)

CERTIFICATE HOLDER**CANCELLATION** See Attachments**20681212**Oklahoma City Water Utilities Trust
420 W. Main St., Ste. 500
Oklahoma City OK 73102

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Waiver of subrogation applies to general liability and auto liability where allowed by state law and as required by written contract. General Liability and Auto Liability include severability of interests. General Liability, Auto Liability & Workers' Compensation Deductibles: N/A. Professional Liability Deductible: \$25,000. Thirty (30) days' notice of cancellation by the insurer will be provided to the Certificate Holder, ten (10) days' notice in the event of non-payment of premium.

POLICY NUMBER: 0313-9010

ENDORSEMENT

NOTICE OF CANCELLATION TO DESIGNATED ENTITY(IES)

Policy No. 0313-9010
Issued to Carollo Engineers, Inc.
Issued by Allied World Surplus Lines Insurance Company

In consideration of the premium charged, it is hereby agreed that Section VIII. CONDITIONS, Subsection H. is amended to include the following:

In the event of cancellation or non-renewal of this Policy, the **Company** will provide a thirty-day notice to the entity with whom the **Named Insured** has agreed, pursuant to a prior written contract, to provide to such entity with a notice of cancellation or non-renewal. Provided, however, that in the event of cancellation for non-payment of premium, the **Company** shall provide to such entity a ten-day notice of cancellation before the effective date of cancellation.

In addition, in the event of a reduction in the Limits of Liability of this Policy not resulting from payment of **Damages** or **Defense Expenses**, the **Company** will provide a sixty-day notice to the entity with whom the **Named Insured** has agreed with, pursuant to a prior written contract, to provide such entity with a notice of such reduction in limits.

As a condition precedent to providing the notices specified above, the **Named Insured** will provide the **Company**, within ten (10) business days of the **Company's** request, the names and addresses of the entities with whom the **Named Insured** agreed to provide the notices specified above. In the event the **Named Insured** omits or fails to provide the foregoing information, the **Company** shall not provide such notices.

The **Company's** failure to provide such notices will not extend the Policy cancellation date, negate cancellation, non-renewal or reduction in limits, of this Policy. Nor shall such failure be cause for legal action against the **Company**.

All other terms, conditions and limitations of this Policy shall remain unchanged.

POLICY NUMBER: BAP 9730571

Notification to Others of Cancellation, Nonrenewal or Reduction of Insurance

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial Automobile Coverage Part

- A.** If we cancel or non-renew this Coverage Part by written notice to the first Named Insured for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal:
1. To the name and address corresponding to each person or organization shown in the Schedule below; and
 2. At least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to the first Named Insured, or the longer number of days notice if indicated in the Schedule below.
- B.** If we cancel this Coverage Part by written notice to the first Named Insured for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.
- C.** If coverage afforded by this Coverage Part is reduced or restricted, except for any reduction of Limits of Insurance due to payment of claims, we will mail or deliver notice of such reduction or restriction:
1. To the name and address corresponding to each person or organization shown in the Schedule below; and
 2. At least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.
- D.** If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE	
Name and Address of Other Person(s) / Organization(s):	Number of Days Notice:
All certificate holders where notice of cancellation is required by written contract with the Named Insured	30

All other terms and conditions of this policy remain unchanged.

U-CA-811-A CW (05/10)

Includes copyrighted material of Insurance Services Office, Inc., with its permission.

POLICY NUMBER: GLO 9730569

Notification to Others of Cancellation, Nonrenewal or Reduction of Insurance

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial General Liability Coverage Part
Liquor Liability Coverage Part
Products/Completed Operations Liability Coverage Part

- A.** If we cancel or non-renew this Coverage Part(s) by written notice to the first Named Insured for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal:
1. To the name and address corresponding to each person or organization shown in the Schedule below; and
 2. At least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to the first Named Insured, or the longer number of days notice if indicated in the Schedule below.
- B.** If we cancel this Coverage Part(s) by written notice to the first Named Insured for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.
- C.** If coverage afforded by this Coverage Part(s) is reduced or restricted, except for any reduction of Limits of Insurance due to payment of claims, we will mail or deliver notice of such reduction or restriction:
1. To the name and address corresponding to each person or organization shown in the Schedule below; and
 2. At least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.
- D.** If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE	
Name and Address of Other Person(s) / Organization(s):	Number of Days Notice:
All certificate holders where notice of cancellation is required by written contract with the Named Insured.	30

All other terms and conditions of this policy remain unchanged.

WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE POLICY**WC 99 06 34****NOTIFICATION TO OTHERS OF CANCELLATION, NONRENEWAL OR
REDUCTION OF INSURANCE ENDORSEMENT**

This endorsement is used to add the following to Part Six of the policy.

**PART SIX
CONDITIONS**

- A. If we cancel or non-renew this policy by written notice to you for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal to the name and address corresponding to each person or organization shown in the Schedule below. Notification to such person or organization will be provided at least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to you, or the longer number of days notice if indicated in the Schedule below.
- B. If we cancel this policy by written notice to you for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.
- C. If coverage afforded by this policy is reduced or restricted, except for any reduction of Limits of Liability due to payment of claims, we will mail or deliver notice of such reduction or restriction to the name and address corresponding to each person or organization shown in the Schedule below. Notification to such person or organization will be provided at least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.
- D. If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE

Name and Address of Other Person(s)/Organizations:	All Certificate holders where notice of cancellation is required by written contract with the Named
Number of Days Notice:	30

All other terms and conditions of this policy remain unchanged.

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.
(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Policy No. WC 9730570

Insured CAROLLO ENGINEERS, INC.
Insurance Company Zurich American Insurance Company

WC 99 06 34

POLICY NUMBER: GLO 9730569

COMMERCIAL GENERAL LIABILITY
CG 20 37 12 19**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.****ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – COMPLETED OPERATIONS**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART**SCHEDULE**

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
Any person or organization, other than an architect, engineer or surveyor, whom you are required to add as an additional insured under this policy under a written contract mark or written agreement executed prior to loss.	Any Location or project, other than a wrap-up or other consolidated insurance program location or project for which insurance is otherwise separately provided to you by a wrap-up or other consolidated insurance program
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

- A. Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".
- However:
1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
 2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.
- B. With respect to the insurance afforded to these additional insureds, the following is added to Section III – Limits Of Insurance:**
- If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:
1. Required by the contract or agreement; or
 2. Available under the applicable Limits of Insurance; whichever is less.
- This endorsement shall not increase the applicable Limits of Insurance.

POLICY NUMBER: GLO 9730569

COMMERCIAL GENERAL LIABILITY
CG 20 10 12 19**THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.****ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – SCHEDULED PERSON OR
ORGANIZATION**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location(s) Of Covered Operations
Any person or organization, other than an architect, engineer or surveyor, whom you are required to add as an additional insured under this policy under a written contract or written agreement executed prior to loss.	Any Location or project, other than a wrap-up or other consolidated insurance program location or project for which insurance is otherwise separately provided to you by a wrap-up or other consolidated insurance program
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and
2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to "bodily injury" or "property damage" occurring after:

1. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
2. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

POLICY NUMBER: GLO 9730569

- C.** With respect to the insurance afforded to these additional insureds, the following is added to
Section III – Limits Of Insurance:

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or

2. Available under the applicable Limits of Insurance;
whichever is less.

This endorsement shall not increase the applicable Limits of Insurance.

POLICY NUMBER: GLO 9730569

Other Insurance Amendment - Primary and Non-Contributory

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial General Liability Coverage Part

1. The following paragraph is added to the Other Insurance Condition of Section **IV – Commercial General Liability Conditions**:

This insurance is primary insurance to and will not seek contribution from any other insurance available to an additional insured under this policy provided that:

- a. The additional insured is a Named Insured under such other insurance; and
- b. You are required by a written contract or written agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

2. The following paragraph is added to Paragraph **4.b.** of the Other Insurance Condition of Section **IV – Commercial General Liability Conditions**:

This insurance is excess over:

Any of the other insurance, whether primary, excess, contingent or on any other basis, available to an additional insured, in which the additional insured on our policy is also covered as an additional insured on another policy providing coverage for the same "occurrence", offense, claim or "suit". This provision does not apply to any policy in which the additional insured is a Named Insured on such other policy and where our policy is required by written contract or written agreement to provide coverage to the additional insured on a primary and non-contributory basis.

All other terms and conditions of this policy remain unchanged.

POLICY NUMBER: BAP 9730571

COMMERCIAL AUTO
CA 20 48 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED FOR COVERED AUTOS LIABILITY COVERAGE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" for Covered Autos Liability Coverage under the Who Is An Insured provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

SCHEDULE

Name Of Person(s) Or Organization(s):
Any person or organization to whom or which you are required to provide additional insured status or additional insured status on a primary, non-contributory basis, in a written contract or written agreement executed prior to loss, except where such contract or agreement is prohibited by law.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

Each person or organization shown in the Schedule is an "insured" for Covered Autos Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Paragraph **A.1.** of Section **II** – Covered Autos Liability Coverage in the Business Auto and Motor Carrier Coverage Forms and Paragraph **D.2.** of Section **I** – Covered Autos Coverages of the Auto Dealers Coverage Form.

Waiver Of Subrogation (Blanket) Endorsement

Policy No. GLO 9730569

Eff. Date of Pol. 7/4/2024

Exp. Date of Pol. 7/4/2025

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial General Liability Coverage Part

The following is added to the Transfer Of Rights Of Recovery Against Others To Us Condition:
If you are required by a written contract or agreement, which is executed before a loss, to waive your rights of recovery from others, we agree to waive our rights of recovery. This waiver of rights applies only with respect to the above contract(s) and shall not be construed to be a waiver with respect to any other operations in which the insured has no contractual interest.

U-GL-925-A CW (12/01)

POLICY NUMBER

BAP 9730571

COMMERCIAL AUTO

CA 04 44 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**WAIVER OF TRANSFER OF RIGHTS OF RECOVERY
AGAINST OTHERS TO US (WAIVER OF SUBROGATION)**

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

Named Insured: Zurich American Insurance Company

Endorsement Effective Date: 7/4/2024

SCHEDULE

Name(s) Of Person(s) Or Organization(s):

Any person or organization you are required to waive your rights of recovery in a written contract, agreement or permit with the named insured.

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The **Transfer Of Rights Of Recovery Against Others To Us** condition does not apply to the person(s) or organization(s) shown in the Schedule, but only to the extent that subrogation is waived prior to the "accident" or the "loss" under a contract with that person or organization.