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April 21, 2026

City of Crest Hill  
20600 City Center Boulevard  
Crest Hill, IL 60402

Attention: Mr. Ron Weideman, P.E., City Engineer

Re: Agreement for Engineering Services  
2026 Water System Model Update and Water Main Replacement Prioritization Plan

This is an Agreement between the City of Crest Hill, Illinois, hereinafter referred to as OWNER, and Strand Associates, Inc.<sup>®</sup>, hereinafter referred to as ENGINEER, to provide engineering services (Services) for the 2026 Water System Model Update and Water Main Replacement Prioritization Plan project. This Agreement shall be in accordance with the following elements.

### **Scope of Services**

ENGINEER will provide the following Services to OWNER.

#### Data Collection and Existing System Details

1. Conduct an initial project meeting with OWNER to gather data, review scope and schedule, and discuss the quantitative risk-based assessment of the existing water distribution system using probability of failure (POF) and consequence of failure (COF) criteria.
2. Prepare an updated summary of the existing facility's capacities, pertinent equipment such as pump sizes and capacities, and storage tank styles and capacities.
3. Prepare preliminary figures based on OWNER-supplied data summarizing water main and water system details including diameters, material types, break locations, high-use customers, dead end locations, transmission main, and other details which may affect water main life based on discussions with OWNER.
4. Summarize the project background and data collected and existing water system details in draft report Sections 1 and 2.

#### Water Demand Analysis and Pumping Capacity Analysis

1. Review water demand projections prepared during the Lake Michigan Allocation process. Update analysis to reflect demand trends from 2022 to 2025, and prepare new demand projections through 2050, including pending development along Caton Farm Road, Division Street and Broadway Street.
2. Perform a water supply capacity analysis to review the ability of the existing system and future Lake Michigan water system to meet the water demand projections.
3. Prepare draft report Section 3 summarizing the water demand and pumping capacity analyses and findings.

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4. Prepare a figure showing proposed hydrant flow test locations and a draft risk assessment matrix for evaluation of water main replacement. Submit the figure, matrix, and draft report Sections 1–3 to OWNER and attend Progress Meeting No. 1 to review the information and gather comments.

Steady-State Water Model Development

1. Prepare an updated computerized WaterGEMS water system model (water model) using updated geographical information system data and other OWNER-provided information.
2. Attend OWNER-conducted fire flow testing for up to 15 locations and gather flow and pressure readings using ENGINEER’s gauges and equipment.
3. Perform a steady-state calibration of the water model using field fire flow testing results and OWNER-provided supervisory control and data acquisition system information, including booster pump flows and storage facility water levels during testing.
4. Review the existing water system performance using the steady-state calibrated water model for current average and maximum day demands. Generate pressure and maximum day demand available fire flow figures.
5. Review potential system deficiencies based on average day demands (ADD), maximum day demands (MDD), and MDD with available fire flow modeling. The following 2025 steady state simulations will be modeled under Section 4 of the report:

Steady State Simulations—Table 1

Demand Scenario	Description
Pressures Under 2025 ADD	Existing System Hydraulic Analysis
Pressures Under 2025 MDD	
Fire Flows Under 2025 MDD	

6. Prepare a draft report Section 4 summarizing the model preparation, calibration, and current day analyses.

Extended Period Simulation (EPS) Model Calibration and Analysis

1. Perform an EPS calibration of the water model using OWNER-provided hourly pumping and storage facility information from a 24-hour period in 2025 that represents the maximum day demand condition. This calibration will not include pipe segment C-factor field testing.
2. Adjust well operation settings under a 2025 ADD EPS to simulate reduced runtimes associated with wells historically higher in per- and polyfluoroalkyl substances (PFAS).
3. Review model-predicted water age for the water model junctions and storage facilities using an extended period simulation for the 2025 average day demand condition. Water age will be relative water age based on EPS calibration. The following extended period simulations will be modeled under Section 4 of the report:

EPS—Table 2

Demand Scenario	Description
Water Age Under 2025 ADD	PFAS and Well Water Trace Analysis
Trace Analysis Under 2025 ADD	
Pressures Under 2025 MDD	

- Supplement the steady-state water model development report section, Section 4, with the extended period simulation analysis and results.

Water System Analysis for Modifications and Future Growth

- Use the water model to simulate changes in demands caused by growth to years 2030 and 2050 and review potential modifications to meet the changes in demand including the potential need for additional water supply, storage, or pumping facilities. Include OWNER-identified water main replacement and construction within the city to 2050. Growth information shall be provided by OWNER.
- Use the water model to review OWNER’s scenarios and review infrastructure modifications. The following future simulations will be modeled under Section 5 of the report:

Future Simulations—Table 3

Demand Scenario	Simulation Type	Description
Pressures and Velocities Under 2030 ADD	Steady State	Lake Michigan Water System Hydraulic Analysis
Pressures and Velocities Under 2030 MDD		
Fire Flows Under 2030 MDD		
Water Age Under 2025 ADD	EPS	
Pressures and Velocities Under 2050 ADD	Steady State	Long-Term Lake Michigan Water System Hydraulic Analysis
Fire Flows Under 2050 MDD		
Seven Additional OWNER-Provided Model Simulations		

Risk Assessment-Based Water Main Replacement Prioritization Plan

- Review OWNER-provided information that is anticipated to include water main age, potential remaining life, break history, material, size, and soil characteristics.
- Review water system for potential water main extensions for distribution system looping purposes. Review potential extensions with modeling results.
- Prepare a draft risk assessment matrix based on POF and COF criteria and submit to OWNER for review prior to Progress Meeting 1. Review OWNER-provided road condition report to revise COF criteria.
- Review draft water main risk matrix, scoring breakdowns, and weighting factors prior to the initial risk score calculations during Progress Meeting 1. Incorporate OWNER comments, as appropriate.
- Develop initial water main prioritization ranking list and color-coded figure based on matrix scoring criteria, weightings, and non-water projects established by OWNER.
- Prepare a draft report Section 6 with a summary of risk-based asset assessment and water main prioritization plan.
- Submit draft report Sections 4–6 to the OWNER and attend Progress Meeting No. 2 to review the information and collect comments.

#### Additional Assessments and Analyses

1. Perform up to two additional iterations of adjustments and analyses of the scenarios in the water model based on comments from OWNER review meeting and adjust draft report sections to reflect changes in results.
2. Perform up to two additional iterations of water main prioritization ranking and figure development.
3. Attend Progress Meeting No. 3 to discuss the updated results of the additional iterations of modeling and water main replacement ranking.

#### Summary and Conclusions

1. Prepare opinions of probable capital cost (OPCC) for water system modifications in the various report sections in accordance with Association for the Advancement of Cost Engineering (AACE) Cost Estimate Classification System, Class 5 criteria.
2. Provide AACE Cost Estimate Classification System, Class 5 OPCC for the prioritized water main replacement projects through the next five-year planning period based on OWNER-selected annual goals and budgets for water main replacement.
3. Prepare a figure showing project locations and possible year of the modifications.
4. Prepare draft report Section 7 with the summary and conclusions.

#### Final Report

1. Compile report sections into one draft report document and submit to OWNER for review. Attend Progress Meeting 4 with OWNER to review the draft report and gather comments.
2. Incorporate OWNER comments into the report, as appropriate, and compile a final report with Executive Summary and Conclusions.
3. Finalize the report and submit two hard copies and one electronic copy to OWNER.
4. Provide OWNER's current water system model files with 2025 water demands and current day scenarios on a portable media storage device.

#### **Service Elements Not Included**

The following services are not included in this Agreement. If such services are required, they will be provided through an amendment to this Agreement or through a separate agreement with OWNER.

1. Additional Site Visits and/or Meetings: Additional OWNER-required site visits or meetings.
2. Drawings and Specifications: Design services including drawings and specifications.
3. Preparation for and/or Appearance in Litigation on Behalf of OWNER: Any services related to litigation.
4. Revising Designs, Drawings, Specifications, and Documents: Any services required after these items have been previously approved by state or federal regulatory agencies, because of a change in project scope or where such revisions are necessary to comply with changed state and federal regulations that are put in force after Services have been partially completed.

**Compensation**

OWNER shall compensate ENGINEER for Services under this Agreement on an hourly rate basis plus expenses an estimated fee of \$150,000, generally allocated as follows:

Services	Compensation
Data Collection and Existing System Details	\$ 13,500
Water Demand Analysis and Pumping Capacity Analysis	\$ 10,600
Steady-State Water Model Development	\$ 29,200
EPS Model Calibration and Analysis	\$ 24,000
Water System Analysis for Modifications and Future Growth	\$ 16,600
Risk Assessment-Based Water Main Replacement Prioritization Plan	\$ 22,600
Additional Assessment and Analyses	\$ 15,700
Summary and Conclusions	\$ 9,800
Final Report	\$ 8,000
<b>Total</b>	<b>\$150,000</b>

Expenses incurred such as those for travel, meals, printing, postage, copies, computer, electronic communication, and long-distance telephone calls will be billed at actual cost plus ten percent.

Only sales taxes or other taxes on Services that are in effect at the time this Agreement is executed are included in the Compensation. If the tax laws are subsequently changed by legislation during the life of this Agreement, this Agreement will be adjusted to reflect the net change.

The estimated fee for the Services is based on wage scale/hourly billing rates, adjusted annually on July 1, that anticipates the Services will be completed as indicated. Should the completion time be extended, it may be cause for an adjustment in the estimated fee that reflects any wage scale adjustments made.

The estimated fee will not be exceeded without prior notice to and agreement by OWNER but may be adjusted for time delays, time extensions, amendments, or changes in the **Scope of Services**. Any adjustments will be negotiated based on ENGINEER’s increase or decrease in costs caused by delays, extensions, amendments, or changes.

**Schedule**

Services will begin upon execution of this Agreement, which is anticipated the week of June 17, 2026. Services are scheduled for completion in general accordance with the following project milestones.

Services	Completion Date
Draft Report Sections 1–3: Data Collection, Existing System Details, Water Demand, Storage and Pumping Capacity Analysis	August 10, 2026
Draft Report Sections 4–6: Steady-State Water Model Development, EPS Model Calibration and Analysis, Water System Analysis for Modifications and Future Growth, Risk Assessment-Based Water Main Replacement Prioritization Plan	November 19, 2026
Additional Assessments and Analyses (Draft Report Sections 4 and 5 Supplement)	January 29, 2027
Final Draft Report Sections 1–7	March 29, 2027
Final Report	May 19, 2027

### **Standard of Care**

The Standard of Care for all Services performed or furnished by ENGINEER under this Agreement will be the care and skill ordinarily used by members of ENGINEER's profession practicing under similar circumstances at the same time and in the same locality. ENGINEER makes no warranties, express or implied, under this Agreement or otherwise, in connection with ENGINEER's Services.

### **OWNER's Responsibilities**

1. Assist ENGINEER by placing at ENGINEER's disposal all available information pertinent to this project including previous reports, previous drawings and specifications, and any other data relative to the scope of this project.
2. Furnish to ENGINEER, as required by ENGINEER for performance of Services as part of this Agreement, data prepared by or services of others obtained or prepared by OWNER relative to the scope of this project, such as soil borings, probings and subsurface explorations, and laboratory tests and inspections of samples, all of which ENGINEER may rely upon in performing Services under this Agreement.
3. Provide access to and make all provisions for ENGINEER to enter upon public and private lands as required for ENGINEER to perform Services under this Agreement.
4. Examine all reports, sketches, estimates, special provisions, drawings, and other documents presented by ENGINEER and render, in writing, decisions pertaining thereto within a reasonable time so as not to delay the performance of ENGINEER.
5. Provide all legal services as may be required for the development of this project.
6. Pay all permit and plan review fees payable to regulatory agencies.
7. Provide operation of all valves and hydrants and all traffic control for the fire flow testing.

### **Opinion of Probable Cost**

Any opinions of the probable cost prepared by ENGINEER are supplied for general guidance of OWNER only. ENGINEER has no control over competitive bidding or market conditions and cannot guarantee the accuracy of such opinions as compared to contract bids or actual costs to OWNER. If OWNER requires more than general guidance, then OWNER agrees to obtain an independent cost estimate by others.

### **Changes**

1. OWNER may make changes within the general scope of this Agreement in the Services to be performed. If such changes cause an increase or decrease in ENGINEER's cost or time required for performance of any Services under this Agreement, an equitable adjustment will be made, and this Agreement will be modified in writing accordingly.
2. No services for which additional compensation will be charged by ENGINEER will be furnished without the written authorization of OWNER. The fee established herein will not be exceeded without agreement by OWNER but may be adjusted for time delays, time extensions, amendments, or changes in the **Scope of Services**.
3. If there is a modification of Agency requirements relating to the Services to be performed under this Agreement subsequent to the date of execution of this Agreement, the increased or decreased cost of performance of the Services provided for in this Agreement will be reflected in an appropriate modification of this Agreement.

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### **Extension of Services**

This Agreement may be extended for additional Services upon OWNER's authorization. Extension of Services will be provided for a lump sum or an hourly rate plus expenses.

### **Payment**

OWNER shall make monthly payments to ENGINEER for Services performed in the preceding month based upon monthly invoices. Nonpayment 30 days after the date of receipt of invoice may, at ENGINEER's option, result in assessment of a 1 percent per month carrying charge on the unpaid balance.

Nonpayment 45 days after the date of receipt of invoice may, at ENGINEER's option, result in suspension of Services upon five calendar days' notice to OWNER. ENGINEER will have no liability to OWNER, and OWNER agrees to make no claim for any delay or damage as a result of such suspension caused by any breach of this Agreement by OWNER. Upon receipt of payment in full of all outstanding sums due from OWNER, or curing of such other breach which caused ENGINEER to suspend Services, ENGINEER will resume Services and there will be an equitable adjustment to the remaining project schedule and compensation as a result of the suspension.

Failure to make payments to ENGINEER is cause for termination upon two-week notice to OWNER.

### **Termination**

This Agreement may be terminated with cause in whole or in part in writing by either party subject to a two-week notice and the right of the party being terminated to meet and discuss the termination before the termination takes place. ENGINEER will be paid for all completed or obligated Services up to the date of termination.

### **Data Provided by Others**

ENGINEER is not responsible for the quality or accuracy of data nor for the methods used in the acquisition or development of any such data where such data is provided by or through OWNER, contractor, or others to ENGINEER and where ENGINEER's Services are to be based upon such data. Such data includes, but is not limited to, soil borings, groundwater data, chemical analyses, geotechnical testing, reports, calculations, designs, drawings, specifications, record drawings, contractor's marked-up drawings, and topographical surveys.

### **Third-Party Beneficiaries**

Nothing contained in this Agreement creates a contractual relationship with or a cause of action in favor of a third party against either OWNER or ENGINEER. ENGINEER's Services under this Agreement are being performed solely for OWNER's benefit, and no other party or entity shall have any claim against ENGINEER because of this Agreement or the performance or nonperformance of Services hereunder. OWNER and ENGINEER agree to require a similar provision in all contracts with contractors, subcontractors, subconsultants, vendors, and other entities involved in this project to carry out the intent of this provision.

### **Dispute Resolution**

Except as may be otherwise provided in this Agreement, all claims, counterclaims, disputes, and other matters in question between OWNER and ENGINEER arising out of or relating to this Agreement or the breach thereof will be decided first by mediation, if the parties mutually agree, or with a bench trial in a court of competent jurisdiction within the State of Illinois.

