

**AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES  
WITH CAROLLO ENGINEERS, INC. FOR  
2019-20 WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE**

**CITY PROJECT NO. 85820**

THIS AGREEMENT is entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2019, by and between the City of Burlingame, State of California, herein called the "City", and **Carollo Engineers, Inc.** engaged in providing **PROFESSIONAL ENGINEERING** services herein called the "Consultant".

**RECITALS**

- A. The City is considering conducting activities for professional engineering services for the preparation of the 2019-20 Wastewater Collection System Master Plan Update, City Project No. 85820.
- B. The City desires to engage a professional engineering consultant to provide professional engineering services because of Consultant's experience and qualifications to perform the desired work, described in Exhibit A.
- C. The Consultant represents and affirms that it is qualified and willing to perform the desired work pursuant to this Agreement.

**AGREEMENTS**

NOW, THEREFORE, THE PARTIES HERETO AGREE AS FOLLOWS:

- 1. Scope of Services. The Consultant shall provide professional engineering services such as data collection, flow monitoring/analysis, hydraulic model development, system performance evaluation and capacity assurance plan, Capital Improvement Plan development, master plan preparation, and as detailed in "Scope of Services" of the attached Exhibit A of this agreement.
- 2. Time of Performance. The services of the Consultant are to commence upon the execution of this Agreement with completion of all work as set forth in Exhibit A - Scope of Work, which will be October 31, 2020.
- 3. Compliance with Laws. The Consultant shall comply with all applicable laws, codes, ordinances, and regulations of governing federal, state and local laws.

Consultant represents and warrants to City that it has all licenses, permits, qualifications and approvals of whatsoever nature which are legally required for Consultant to practice its profession. Consultant represents and warrants to City that Consultant shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, and approvals which are legally required for Consultant to practice its profession. Consultant shall maintain a City of Burlingame business license.

4. Sole Responsibility. Consultant shall be responsible for employing or engaging all persons necessary to perform the services under this Agreement.
5. Information/Report Handling. All documents furnished to Consultant by the City and all reports and supportive data prepared by the Consultant under this Agreement are the City's property and shall be delivered to the City upon the completion of Consultant's services or at the City's written request. All reports, information, data, and exhibits prepared or assembled by Consultant in connection with the performance of its services pursuant to this Agreement are confidential until released by the City to the public, and the Consultant shall not make any of these documents or information available to any individual or organization not employed by the Consultant or the City without the written consent of the City before such release. The City acknowledges that the reports to be prepared by the Consultant pursuant to this Agreement are for the purpose of evaluating a defined project, and City's use of the information contained in the reports prepared by the Consultant in connection with other projects shall be solely at City's risk, unless Consultant expressly consents to such use in writing. City further agrees that it will not appropriate any methodology or technique of Consultant which is and has been confirmed in writing by Consultant to be a trade secret of Consultant.
6. Compensation. Compensation for Consultant's professional services shall not exceed \$483,100; and payment shall be based upon City approval of each task.

Billing shall include current period and cumulative expenditures to date and shall be accompanied by a detailed explanation of the work performed by whom at what rate and on what date. Also, plans, specifications, documents or other pertinent materials shall be submitted for City review, even if only in partial or draft form.

7. Availability of Records. Consultant shall maintain the records supporting this billing for not less than three (3) years following completion of the work under this Agreement. Consultant shall make these records available to authorized

personnel of the City at the Consultant's offices during business hours upon written request of the City.

8. Project Manager. The Project Manager for the Consultant for the work under this Agreement shall be Tim Loper, Senior Project Manager.
9. Assignability and Subcontracting. The services to be performed under this Agreement are unique and personal to the Consultant. No portion of these services shall be assigned or subcontracted without the written consent of the City.
10. Notices. Any notice required to be given shall be deemed to be duly and properly given if mailed postage prepaid, and addressed to:

To City: Mahesh Yedluri, Senior Civil Engineer  
City of Burlingame  
501 Primrose Road  
Burlingame, CA 94010

To Consultant: Tim Loper, Senior Project Manager  
Carollo Engineers, Inc.  
100 West Liberty, Suite 740  
Reno, NV 89501

or personally delivered to Consultant to such address or such other address as Consultant designates in writing to City.

11. Independent Contractor. It is understood that the Consultant, in the performance of the work and services agreed to be performed, shall act as and be an independent contractor and not an agent or employee of the City. As an independent contractor he/she shall not obtain any rights to retirement benefits or other benefits which accrue to City employee(s). With prior written consent, the Consultant may perform some obligations under this Agreement by subcontracting, but may not delegate ultimate responsibility for performance or assign or transfer interests under this Agreement.

Consultant agrees to testify in any litigation brought regarding the subject of the work to be performed under this Agreement. Consultant shall be compensated for its costs and expenses in preparing for, traveling to, and testifying in such matters at its then current hourly rates of compensation, unless such litigation is

brought by Consultant or is based on allegations of Consultant's negligent performance or wrongdoing.

12. Conflict of Interest. Consultant understands that its professional responsibilities is solely to the City. The Consultant has and shall not obtain any holding or interest within the City of Burlingame. Consultant has no business holdings or agreements with any individual member of the Staff or management of the City or its representatives nor shall it enter into any such holdings or agreements. In addition, Consultant warrants that it does not presently and shall not acquire any direct or indirect interest adverse to those of the City in the subject of this Agreement, and it shall immediately disassociate itself from such an interest should it discover it has done so and shall, at the City's sole discretion, divest itself of such interest. Consultant shall not knowingly and shall take reasonable steps to ensure that it does not employ a person having such an interest in this performance of this Agreement. If after employment of a person, Consultant discovers it has employed a person with a direct or indirect interest that would conflict with its performance of this Agreement, Consultant shall promptly notify City of this employment relationship, and shall, at the City's sole discretion, sever any such employment relationship.
13. Equal Employment Opportunity. Consultant warrants that it is an equal opportunity employer and shall comply with applicable regulations governing equal employment opportunity. Neither Consultant nor its subcontractors do and neither shall discriminate against persons employed or seeking employment with them on the basis of age, sex, color, race, marital status, sexual orientation, ancestry, physical or mental disability, national origin, religion, or medical condition, unless based upon a bona fide occupational qualification pursuant to the California Fair Employment & Housing Act.
14. Insurance.
  - A. Minimum Scope of Insurance:
    - i. Consultant agrees to have and maintain, for the duration of the contract, General Liability insurance policies insuring him/her and his/her firm to an amount not less than: One million dollars (\$1,000,000) combined single limit per occurrence and two million dollars (\$2,000,000) aggregate for bodily injury, personal injury and property damage in a form at least as broad as ISO Occurrence Form CG 0001.

- ii. Consultant agrees to have and maintain for the duration of the contract, an Automobile Liability insurance policy ensuring him/her and his/her staff to an amount not less than one million dollars (\$1,000,000) combined single limit per accident for bodily injury and property damage.
- iii. Consultant agrees to have and maintain, for the duration of the contract, professional liability insurance in amounts not less than two million dollars (\$2,000,000) each claim/aggregate sufficient to insure Consultant for professional errors or omissions in the performance of the particular scope of work under this agreement.
- iv. Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration, and defense expenses.

B. General and Automobile Liability Policies:

- i. The City, its officers, officials, employees and volunteers are to be covered as insured as respects: liability arising out of activities performed by or on behalf of the Consultant; products and completed operations of Consultant, premises owned or used by the Consultant. The endorsement providing this additional insured coverage shall be equal to or broader than ISO Form CG 20 10 11 85 and must cover joint negligence, completed operations, and the acts of subcontractors. This requirement does not apply to the professional liability insurance required for professional errors and omissions.
- ii. The Consultant's insurance coverage shall be endorsed to be primary insurance as respects the City, its officers, officials, employees and volunteers. Any insurance or self-insurances maintained by the City, its officers, officials, employees or volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

- iii. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the City, its officers, officials, employees or volunteers.
    - iv. The Consultant's insurance shall apply separately to each insured against whom a claim is made or suit is brought, except with respect to the limits of the insurer's liability.
  - C. In addition to these policies, Consultant shall have and maintain Workers' Compensation insurance as required by California law. Further, Consultant shall ensure that all subcontractors employed by Consultant provide the required Workers' Compensation insurance for their respective employees.
  - D. All Coverages: Each insurance policy required in this item shall be endorsed to state that coverage shall not be canceled except after thirty (30) days' prior written notice by mail, has been given to the City (10 days for non-payment of premium). Current certification of such insurance shall be kept on file at all times during the term of this agreement with the City Clerk.
  - E. Acceptability of Insurers: Insurance is to be placed with insurers with a Best's rating of no less than A:VII and authorized to do business in the State of California.
  - F. Verification of Coverage: Upon execution of this Agreement, Contractor shall furnish the City with certificates of insurance and with original endorsements effecting coverage required by this clause. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be on forms approved by the City. All certificates and endorsements are to be received and approved by the City before any work commences. The City reserves the right to require complete, certified copies of all required insurance policies, at any time.
15. Indemnification. To the fullest extent permitted by law, Consultant shall save, keep and hold harmless indemnify and defend the City, its officers, employees, authorized agents and volunteers from all damages, liabilities, penalties, costs, or expenses in law or equity, including but not limited to attorneys' fees, that may at any time arise, result from, relate to, or be set up because of damages to property or personal injury received by reason of, or in the course of performing work which

arise out of, pertain to, or relate to, directly or indirectly, in whole or in part, the negligence, recklessness, or willful misconduct of Consultant, or any of the Consultant's officers, employees, or agents or any subconsultant. This provision shall not apply if the damage or injury is caused by the sole negligence, active negligence, or willful misconduct of the City, its officers, agents, employees, or volunteers.

16. Waiver. No failure on the part of either party to exercise any right or remedy hereunder shall operate as a waiver of any other right or remedy that party may have hereunder, nor does waiver of a breach or default under this Agreement constitute a continuing waiver of a subsequent breach of the same or any other provision of this Agreement.
17. Governing Law. This Agreement, regardless of where executed, shall be governed by and construed under the laws of the State of California. Venue for any action regarding this Agreement shall be in the Superior Court of the County of San Mateo.
18. Termination of Agreement. The City and the Consultant shall have the right to terminate this agreement with or without cause by giving not less than fifteen (15) days written notice of termination. In the event of termination, the Consultant shall deliver to the City all plans, files, documents, reports, performed to date by the Consultant. In the event of such termination, City shall pay Consultant an amount that bears the same ratio to the maximum contract price as the work delivered to the City bears to completed services contemplated under this Agreement, unless such termination is made for cause, in which event, compensation, if any, shall be adjusted in light of the particular facts and circumstances involved in such termination.
19. Amendment. No modification, waiver, mutual termination, or amendment of this Agreement is effective unless made in writing and signed by the City and the Consultant.
20. Entire Agreement. This Agreement constitutes the complete and exclusive statement of the Agreement between the City and Consultant. No terms, conditions, understandings or agreements purporting to modify or vary this Agreement, unless hereafter made in writing and signed by the party to be bound, shall be binding on either party.

IN WITNESS WHEREOF, the City and Consultant have executed this Agreement as of the date indicated on page one (1).

City of Burlingame

"Consultant"

By \_\_\_\_\_  
Lisa K. Goldman  
City Manager

\_\_\_\_\_  
Carollo Engineers, Inc.:  
Print Name:  
Title:

Approved as to form:

\_\_\_\_\_  
City Attorney – Kathleen Kane

ATTEST:

\_\_\_\_\_  
City Clerk - Meaghan Hassel-Shearer



September 3, 2019

## 2019-2020 WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE

City of Burlingame

### Background

The City of Burlingame (City) is seeking the help of a consulting engineer to develop a 2019-2020 wastewater collection system master plan (Master Plan). The City developed a collection system master plan in 2010 that addressed most of the improvements that were necessitated by the San Francisco Baykeeper Consent Decree (Consent Decree). Since that time, the City has worked hard to mitigate capacity deficiencies, and reduce Infiltration and Inflow (I/I) through basin rehabilitation, and increases in collection system capacity.

This goal of the 2019-2020 Master Plan is to gain an understanding of system performance after work has been completed to address the Consent Decree and mitigate capacity deficiencies. The key elements of the plan will be to collect current data on flows, develop an updated model to simulate the peak flows during design storms, and to evaluate and determine areas of the system that need improvement over the next ten years. This plan will develop the road map that helps the City not only meet the baseline set forth by historical Consent Decree order, but helps optimize operations, maximize its use of existing pipeline and pump station capacity, and focus spending to key areas in need of improvement.

The City has request that Carollo Engineers, Inc. (Carollo) develop a scope of services to complete the 2019-2020 Wastewater Collection System Master Plan Update. The Scope of Services is provided below:

### Scope of Services

Carollo Engineers, Inc. (Carollo) will provide the following services to support the development of the 2019-2020 Wastewater Collection System Master Plan Update.

### Task 1 – Data Collection and Assessment of Collection System

Carollo will conduct a data collection and initial assessment of the City's collection system. This task will consist of two sub-tasks described below.

#### *Task 1.1 – Data Collection*

Carollo will develop a data collection matrix that lists the data items required for the completion of the Master Plan. The Data Collection matrix will be presented and discussed at the project Kickoff Meeting. The matrix will provide a prioritization of key data that should be collected a delivered to Carollo first and other data with lower priorities. The matrix will include columns for assigned City staff responsible, data format preferences, and proposed due dates. The data matrix will be updated by Carollo as data is received.

### *Task 1.2 – Background Review and System Assessment*

Carollo will review City provided data to develop an initial assessment of the City's collection system. The review will include SCADA data, previous flow monitoring data, maintenance records, GIS data, as-built drawings, and other data related to system capacity and performance. Carollo will summarize the system data and include the summary in the Master Plan Report (Task 6).

#### **Task 1 - Deliverable:**

- Data Collection Matrix
- Data Collection Summary
- Database that includes all data collected as part of the master plan project

### *Task 2 – Flow Monitoring and Analysis*

Carollo will work closely with the City to develop and conduct a temporary flow monitoring program. The monitoring program will consist of twenty three (23) temporary flow monitoring sites, seven (7) lift station loggers, and three rain gauge locations for a period of two months. In addition to the temporary program, data from the permanent flow monitors for the Town of Hillsborough and Burlingame Hills will be included in the review and analysis. The flow monitoring and analysis will include the development of the flow monitoring plan, the implementation of the flow monitoring program, flow data analysis, and the development of a flow monitoring report.

#### *Task 2.1 – Develop Flow Monitoring Plan*

Carollo will work closely with the City to develop a Temporary Flow Monitoring Plan. The flow monitoring plan will include recommendations on flow monitoring locations, metering technologies, durations, and proposed metering time frames. The plan will be submitted to the City for comment and review. Carollo will conduct a meeting to review the proposed flow monitoring plan.

#### *Task 2.2 – Implement Flow Monitoring Program*

Based on the recommendations from the Flow Monitoring Plan, Carollo will work directly with V&A Consulting Engineers (V&A) to implement the temporary flow monitoring program. V&A will coordinate with City staff related to acquisition of the required permits, and access to the collection system. V&A will install, calibrate, and collect data on regular intervals during the flow monitoring period. V&A will deliver the flow data in electronic format. The monitoring program will consist of twenty three (23) temporary flow monitoring sites, seven (7) lift station loggers, and three rain gauge locations for a period of two months.

#### *Task 2.3 – Flow Data Analysis (Dry and Wet)*

Carollo will conduct analysis of the flow data collected during the temporary flow monitoring program to summarize dry and wet weather flow data. Carollo will develop charts, graphs and figures to illustrate flow conditions throughout the City's collection system by flow monitoring basin as well as lift station tributary area for the lift stations that received lift station loggers. Infiltration and inflow (I/I) parameters will be developed based on the capture of flows during storm events. Flows captured during storm events will be correlated to intensity, duration, and frequency of the observed storm events.

Carollo will conduct a workshop to review the flow data collected as part of the temporary program.

#### *Task 2.4 – Flow Monitoring Report*

Carollo will work with V&A to develop draft and final flow monitoring reports. The report will summarize the flow monitoring locations, metering methods and technologies, measured dry and wet weather flows, captured storms, peaking factors, and I/I flow parameters. V&A will submit a Draft report to Carollo for review and comment. The Draft report with Carollo's revisions will be submitted to the City for review. City comments on the Draft report will be incorporated into the Final Report.

**Task 2 - Deliverables:**

- Draft and Final Flow Monitoring Plan
- Draft and Final Flow Monitoring Report
- Electronic Flow Monitoring Data with any photographs taken during installation

**Task 3 – Hydraulic Model Development**

This task includes the construction and calibration of the City's wastewater collection system model. Carollo will work with the City to review and evaluate hydraulic modeling software, build the hydraulic model from the City's GIS system, calibrate the model to dry and wet weather flow conditions, develop the selected design storms, and develop a model construction and calibration technical memorandum.

*Task 3.1 – Hydraulic Model Software Selection*

Carollo will work closely with the City to review and evaluate the City's options for hydraulic modeling software. Carollo will base the review on several factors including but not limited to ease of use, hydraulic engine, GIS compatibility, and costs. Carollo will conduct a workshop to discuss the software choices, and discuss the recommended options.

*Task 3.2 - Hydraulic Model Construction*

Carollo will use the City's existing model, current GIS data, as-built drawings, and discussions with City staff to construct the City's wastewater collection system network for import into the recommended hydraulic modeling software. The collection system network will be discussed with City staff for completeness and accuracy. Carollo will develop system maps for City review and comment. Carollo will work closely with City operations staff to understand and model pump station operational controls and set points. The model will include all the City's pipelines. Data gaps in the GIS will be filled through a review of as-built drawings, interpolation, or collaboration and communication with City operations staff. Data fields in the model that were filled through other sources will be noted in the database.

Carollo will use water meter billing data to allocate dry weather base wastewater flows into the model at a parcel level to the appropriate manhole. Wet weather flows will be developed based on the I/I parameters measured and calculated based on the wet weather flow monitoring data.

Carollo will conduct a workshop to review the construction of the hydraulic model.

*Task 3.3 – Hydraulic Model Calibration (Dry and Wet)*

Carollo will calibrate the model flows to match flows measured during the flow monitoring program. Carollo will calibrate dry and wet weather flow conditions based on calibration standards developed by the Wastewater Planning Users Group (WaPUG) for both dry and wet weather. Dry and wet weather flows will be calibrated to flow, velocities, and levels. Wet weather flows will be calibrated for up to three storm events (assuming three events were captured during the flow monitoring program). Carollo will also calibrate the model to flows measured at the wastewater treatment plant. Carollo will conduct a model calibration workshop to summarize the model calibration effort, calibration results, areas of concern, or operational discussion items. Carollo will develop model calibration results packets for distribution to City staff at a workshop conducted by the Carollo team.

*Task 3.4 – Design Storm Development*

Carollo will review historical rainfall data, as well as the rainfall data collected during the flow monitoring program to develop a recommended design storm for use in the analysis of the capacity of the wastewater collection system. The development of the design storm will include intensity, duration, and frequency recommendations as well as recommendations on the hourly distribution of rainfall (hyetograph).

### *Task 3.5 – Model Development and Calibration Technical Memorandum*

Carollo will develop a technical memorandum (TM) that summarizes the development and calibration of the hydraulic model. The memo will summarize model elements, model construction methods, model element statistics, flow allocation, design storm development, and dry and wet model calibration. Carollo will submit a Draft TM for City comment and review. City comments will be incorporated into the Final TM.

#### **Task 3 - Deliverables:**

- Model software selection recommendations
- System configuration figures and summaries
- Model calibration spreadsheets for both dry and wet conditions
- Documentation supporting Design Storm Development
- Draft and Final Model Development and Calibration Technical Memorandums

### *Task 4 – System Performance Evaluation and Capacity Assurance Plan*

Task 4 involves the development of evaluation criteria, analysis of the existing system capacity, analysis of the impact of future flows on the existing collection system, and the development of projects to mitigate those deficiencies.

#### *Task 4.1 – Planning and Analysis Criteria*

Carollo will work closely with the City to develop planning and analysis criteria that will form the basis for which improvements are triggered. The criteria will include minimum slopes, maximum depth of flow over pipeline diameter (d/D) ratios, pumping capacity, and wastewater generation rates. Criteria in this section will also include R-values, peaking factors, flow per land use types, and other parameters. Carollo will develop criteria summary tables for review and comment by the City.

#### *Task 4.2 – Existing and Future System Analysis*

Carollo will use the calibrated hydraulic model, in conjunction with the criteria developed in Task 4.1 to evaluate the capacity of the existing wastewater collection system. Deficiencies in the existing system will be identified. The future system scenarios will be developed. Future system analysis will be conducted and the existing system deficiencies will be sized to accommodate future system flows. Improvements needed to serve future users will also be identified.

Carollo will conduct an analysis of the pumping capacity of the City's existing pump stations. Carollo will conduct the capacity evaluation based on the firm capacity of the City's pump stations.

#### *Task 4.3 – Develop Capacity Improvement Projects and System Analysis TM*

Based on the analysis conducted in Task 4.2, Carollo will define the requisite capital improvement projects to serve existing and future users. Carollo will focus improvements on optimizing and combining capital projects where appropriate. Additional focus will be on pump station redundancy and reliability.

Carollo will conduct a project workshop to review the simulated deficiencies, and identified capital projects.

#### **Task 4 - Deliverables:**

- Draft planning and analysis criteria summaries
- System figures illustrating the existing and future capacity deficiencies and proposed projects

## Task 5 – Capital Improvement Plan Development

Based on the work conducted in the previous tasks, Carollo will develop a capital improvement program that includes capital improvement costs, proposed project phasing, existing and future user cost allocations, and annual capital costs expenditures.

### *Task 5.1 – Develop Capital Project Cost Estimates*

Carollo will develop Class 5 planning level cost estimates for proposed existing and future projects. The American Association of Cost Estimating (AACE) defines cost estimates in accordance with understood accuracy. AACE Class 5 cost estimates are planning level cost estimates with an accuracy of -20 to -50%, and +30 to +100 percent. The costs will be broken down by baseline construction and total project costs. Carollo will work with the City to identify required cost contingencies for unknown conditions, engineering, legal and administration or other factors. The cost estimates will also include a determination of existing and future users cost allocations.

### *Task 5.2 – Develop Project Phasing*

Carollo will work closely with the City to review and develop criteria for project phasing. The phasing criteria could include severity of the deficiency, proximity to protected waterways, or other risk factors. Carollo will establish a phasing plan based on the proposed criteria that will include single year breakdowns for the first five years and five year increments following.

### *Task 5.3 – Capital Improvement Program Development and CIP TM*

Carollo will develop a Capital Improvement Program Technical Memorandum that summarizes the proposed projects, cost estimating assumptions, capital project costs, and project phasing. Carollo will submit the technical memorandum to the City prior to conducting the Capital Improvement Program workshop. City comments on the technical memorandum will be incorporated in the Draft and Final Master Plan Report.

#### **Task 5 - Deliverables:**

- Draft Capital Improvement Technical Memorandum
- Final Capital Improvement Technical Memorandum

## Task 6 – Master Plan Preparation

### *Task 6.1 – Develop Draft Master Plan Report*

Carollo will develop a Draft Master Plan report that summarizes the methods, findings and recommendations from Task 1 through Task 5. Carollo will submit the Draft Report to the City for review. Two weeks is allocated for City review of the Master Plan Report. Carollo will incorporate the City's comments into the Final Master Plan Report. Carollo will conduct a project meeting to discuss the Draft Report, its findings and recommendations, and any required changes at a project meeting.

### *Task 6.2 – Develop Final Master Plan Report*

Carollo will develop the Final Master Plan Report based on the comments on the Draft report and any discussion items from the Draft Report Workshop. Carollo will submit electronic copies of the Final Master Plan Report as well as five hard copies.

#### **Task 6 - Deliverables:**

- Electronic copy of the Draft Master Plan Report
- Electronic copy as well as five hard copies of the Final Master Plan Report
- Electronic copy of the final hydraulic model

## Task 7 – Project Management

Project management will be conducted under this task. This includes managing the project team, coordinating with subconsultants, managing the scope of work, and project meetings.

### *Task 7.1 – Project Administration*

Carollo will administer the project to maintain project schedule and budget. The project progress and budget status will be included in monthly progress reports that will be attached to billing invoices. Additionally, the monthly progress reports will include a list of work completed for the time period, meeting minutes for all meetings held during the time period, and an updated decision log.

### *Task 7.2 – Project Meetings and Workshops*

Carollo will conduct a project Kickoff Meeting as well as eight project workshops. The kickoff meeting with City staff will be to discuss the project objectives, communication protocols, review project, and summarize key project milestones and deliverables. The kickoff meeting will be held at the City's offices, and will include Carollo's key project staff and subconsultants.

The proposed list of Project Workshops include:

1. Flow Monitoring Plan Workshop
2. Model Review and Flow Monitoring Workshop
3. Model Calibration Workshop
4. Proposed Improvement Workshop
5. Draft Report and Model Training Workshop
6. Model Training
7. Pump Station Pre-Assessment Workshop

The City of Carollo reserves the right to combine workshops as necessary for efficiency in project delivery. Some workshops could occur via internet meeting and/or conference calls.

### *Task 7.3 – Quality Assurance and Quality Control*

This task includes the activities associated with Quality Assurance and Quality Control (QA/QC). Carollo's QA/QC protocols will include but not be limited to review of all model data, GIS, flow analysis, project deliverables, model calibration, capacity analysis, flow projections, and other elements of the project. QA/QC will be conducted by senior members of Carollo's team or other Carollo team members as necessary.

## Task 8 – Hydraulic Modeling Workshop

Following the completion of the project, Carollo will develop a technical memorandum that summarizes the construction and calibration of the City's hydraulic model. Carollo will also conduct a project workshop to educate City Staff on the model and its functionality.

### *Task 8.1 – Develop Hydraulic Model Documentation*

Carollo will develop a Hydraulic Model Construction Technical Memorandum that summarizes the development and calibration of the City's hydraulic model. The TM will summarize the selected modeling software, elements of the hydraulic model, model calibration methods, flow allocation, and other factors of model development that would be critical for City Staff to understand after the project is complete.

### *Task 8.2 – Conduct Hydraulic Model Workshop*

Following the completion of the project analysis, Carollo will conduct a workshop with City staff to summarize model construction, model calibration, and other elements of the model development that will be critical for City staff to understand. The workshop will be conducted at the City's offices.

## Task 9 – Pump Station Evaluations

Carollo will conduct an evaluation of the City's six pump stations. The evaluation will include a physical condition assessment of each of the pump stations. This task will include a Pre-Inspection Workshop, condition assessments, and the development of a Pump Station Assessment Report. Carollo will proceed with this task only after obtaining written approval either by letter or email from the City.

### *Task 9.1 – Pre-inspection Workshop*

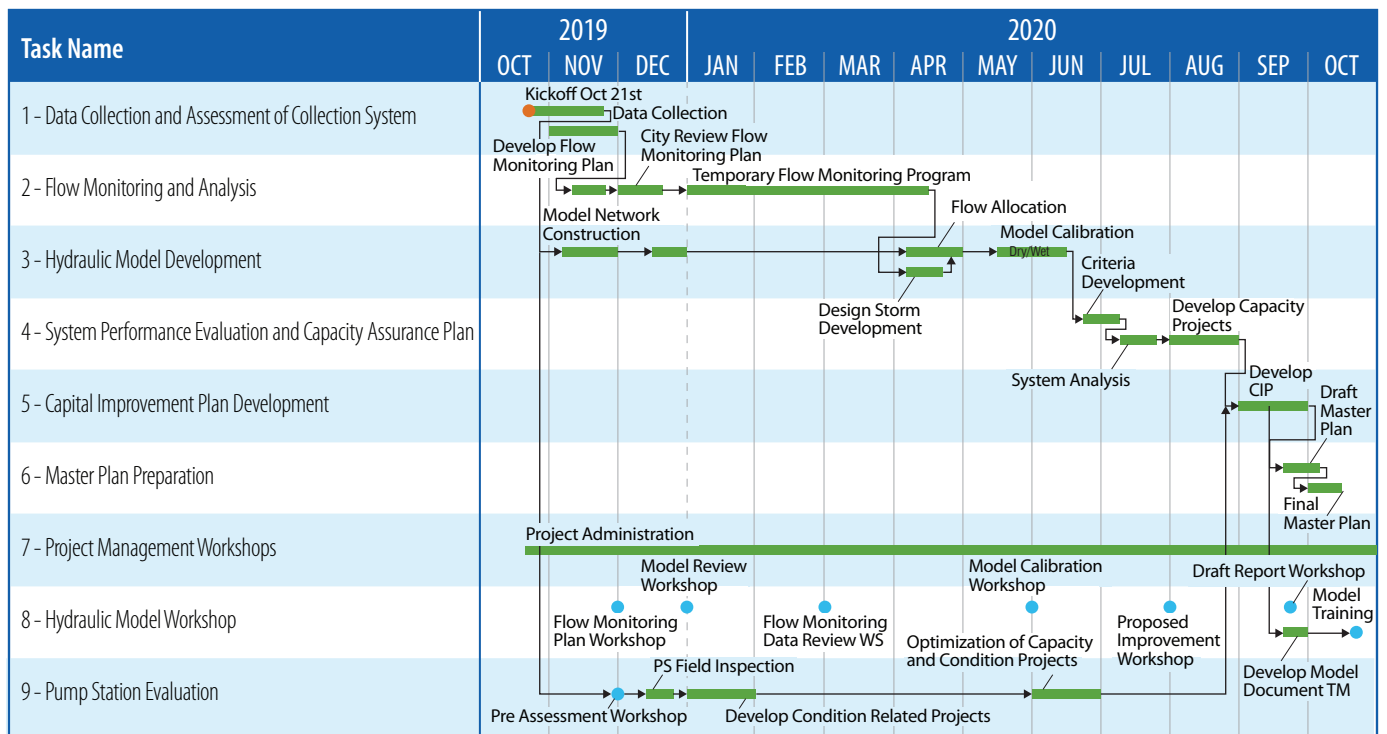
Carollo will work closely with the City to collect as-built drawings, flow data, and other critical data to understand the layout, equipment, and other elements of each pump station site, and operating parameters. Using this data, Carollo will conduct a Pre-Inspection Workshop with City staff to develop an understanding of each pump station to allow for maximum utilization of field time during inspections.

### *Task 9.2 – Pump Station Assessments*

Carollo will conduct two days of field inspection of the City's pump stations. It is assumed that three pump stations per day will be inspected. The inspection will include an evaluation of the structural, and mechanical elements of each facility. City staff will accompany the Carollo inspection team during each inspection to provide access, and any traffic control should it be required. Carollo assumes that no confined entry will be required.

### *Task 9.3 – Pump Station Assessment Report*

Carollo will develop a report that summarizes the findings and recommendations from the pump station evaluations. The report will document the physical inspections and provide recommendations on necessary improvements. The findings and recommendations from the pump station evaluation will be incorporated with the hydraulic capacity recommendations conducted as part of the previous tasks in this scope of work. Carollo will submit a Draft Pump Station Assessment Report to City staff for review and comment. Carollo will incorporate City comments into a Final Pump Station Assessment Report.







FEE ESTIMATE  
2019-20 Wastewater Collection System Master Plan  
City of Burlington



Task Description	Hours by Classification									Labor <sup>(5)</sup>	Subs and Other Direct Expenses <sup>(1)</sup>	Estimated Fee
	Senior Professional - Tim Loper	Senior Professional - Rick Chan	Senior Professional - Eric Harold	Project Professional - Ryan Orgill	Assistant Professional - Mike Wetterau	Project Professional - David Baranowski/Richard Gutierrez	Technician - Riley Powers	Word Processing	Total Hours			
	\$272	\$294	\$272	\$252	\$174	\$252	\$131	\$115				
<b>Task 1 - Data Collection and Assessment of Collection System</b>												
Task 1.1 - Data Collection	2	2	0	4	8	4	2	0	22	\$ 4,800	\$ 300	\$ 5,100
Task 1.2 - Background Review and System Assessment	4	2	0	10	18	6	8	0	48	\$ 9,900	\$ 600	\$ 10,500
Sub-Total Task 1	6	4	0	14	26	10	10	0	70	\$ 14,700	\$ 900	\$ 15,600
<b>Task 2 - Flow Monitoring and Analysis</b>												
Task 2.1 - Develop Flow Monitoring Plan	2	0	0	4	14	0	10	0	30	\$ 5,300	\$ 400	\$ 5,700
Task 2.2 - Implement Flow Monitoring Program	0	0	0	8	6	0	6	0	20	\$ 3,800	\$ 143,200	\$ 147,000
Task 2.3 - Flow Data Analysis (Dry and Wet)	2	0	0	12	20	0	6	0	40	\$ 7,800	\$ 500	\$ 8,300
Task 2.4 - Flow Monitoring Report	2	0	0	10	28	0	6	8	54	\$ 9,600	\$ 1,100	\$ 10,700
Sub-Total Task 2	6	0	0	34	68	0	28	8	144	\$ 26,500	\$ 145,200	\$ 171,700
<b>Task 3 - Hydraulic Model Development</b>												
Task 3.1 - Hydraulic Model Software Selection	2	0	0	6	16	0	0	4	28	\$ 5,300	\$ 300	\$ 5,600
Task 3.2 - Hydraulic Model Construction	0	0	0	18	46	0	14	0	78	\$ 14,400	\$ 900	\$ 15,300
Task 3.3 - Hydraulic Model Calibration (Dry and Wet)	2	0	0	24	110	0	4	0	140	\$ 26,300	\$ 1,700	\$ 28,000
Task 3.4 - Design Storm Development	0	0	0	4	6	0	0	2	12	\$ 2,300	\$ 100	\$ 2,400
Task 3.5 - Model Development and Calibration Technical Memorandum	2	0	0	8	24	0	6	8	48	\$ 8,400	\$ 1,100	\$ 9,500
Sub-Total Task 3	6	0	0	60	202	0	24	14	306	\$ 56,700	\$ 4,100	\$ 60,800
<b>Task 4 - System Performance Evaluation and Capacity Assurance Plan</b>												
Task 4.1 - Planning and Analysis Criteria	2	0	0	4	6	0	0	2	14	\$ 2,800	\$ 200	\$ 3,000
Task 4.2 - Existing and Future System Analysis	4	0	0	36	78	0	14	0	132	\$ 25,600	\$ 1,600	\$ 27,200
Task 4.3 - Develop Capacity Improvement Projects and System Analysis TM	6	0	0	20	44	0	4	0	74	\$ 14,900	\$ 1,400	\$ 16,300
Sub-Total Task 4	12	0	0	60	128	0	18	2	220	\$ 43,300	\$ 3,200	\$ 46,500
<b>Task 5 - Capital Improvement Plan Development</b>												
Task 5.1 - Develop Capital Project Cost Estimates	2	0	0	14	34	24	2	0	76	\$ 16,300	\$ 900	\$ 17,200
Task 5.2 - Develop Project Phasing	2	0	0	6	20	8	2	0	38	\$ 7,800	\$ 500	\$ 8,300
Task 5.3 - Capital Improvement Program Development and CIP TM	2	2	0	10	24	20	14	0	72	\$ 14,700	\$ 1,400	\$ 16,100
Sub-Total Task 5	6	2	0	30	78	52	18	0	186	\$ 38,800	\$ 2,800	\$ 41,600
<b>Task 6 - Master Plan Preparation</b>												
Task 6.1 - Develop Draft Master Plan Report	6	4	0	24	62	10	16	8	130	\$ 25,200	\$ 2,400	\$ 27,600
Task 6.2 - Develop Final Master Plan Report	4	2	0	16	30	6	8	6	72	\$ 14,200	\$ 2,500	\$ 16,700
Sub-Total Task 6	10	6	0	40	92	16	24	14	202	\$ 39,400	\$ 4,900	\$ 44,300
<b>Task 7 - Project Management</b>												
Task 7.1 - Project Administration	16	6	0	10	4	0	0	4	40	\$ 9,800	\$ 500	\$ 10,300
Task 7.2 - Project Meetings and Workshops	16	8	0	14	20	8	4	4	74	\$ 16,700	\$ 3,400	\$ 20,100
Task 7.3 - Quality Assurance and Quality Control	10	4	30	4	6	0	0	0	54	\$ 14,100	\$ 600	\$ 14,700
Sub-Total Task 7	42	18	30	28	30	8	4	8	168	\$ 40,600	\$ 4,500	\$ 45,100
<b>Task 8 - Hydraulic Modeling Workshop</b>												
Task 8.1 - Develop Hydraulic Model Documentation	6	0	2	14	42	0	4	4	72	\$ 14,000	\$ 900	\$ 14,900
Task 8.2 - Conduct Hydraulic Model Workshop (Training)	4	0	0	16	14	0	4	2	40	\$ 8,300	\$ 900	\$ 9,200
Sub-Total Task 8	10	0	2	30	56	0	8	6	112	\$ 22,300	\$ 1,800	\$ 24,100
<b>Task 9 - Pump Station Evaluations</b>												
Task 9.1 - Pre-inspection Workshop	2	2	0	0	2	6	2	2	16	\$ 3,500	\$ 600	\$ 4,100
Task 9.2 - Pump Station Assessments	2	0	0	0	16	32	4	0	54	\$ 11,900	\$ 1,200	\$ 13,100
Task 9.3 - Pump Station Assessment Report	2	2	0	0	24	32	4	8	72	\$ 14,800	\$ 1,400	\$ 16,200
Sub-Total Task 9	6	4	0	0	42	70	10	10	142	\$ 30,200	\$ 3,200	\$ 33,400
<b>Total</b>	<b>104</b>	<b>34</b>	<b>32</b>	<b>296</b>	<b>722</b>	<b>156</b>	<b>144</b>	<b>62</b>	<b>1,550</b>	<b>\$ 312,500</b>	<b>\$ 170,600</b>	<b>\$ 483,100</b>

Notes:

(1) Other direct expenses include mileage travelling to/from meetings at IRS Federal Rate, reproduction at cost plus 5%, and Project Equipment and Communication Expense billed at \$12.00 per hour.

(2) Subconsultant costs include 10% markup

(3) Rates are based on 2019 billing rates

(4) Includes two days of field investigations for pump station assessment

(5) Labor costs rounded to the nearest hundred dollars