



# NAPA SANITATION DISTRICT

## CAROLLO ENGINEERS - TASK ORDER No. 37 2020/2021 FLOW MONITORING PROJECT (CIP 13705)

Date: \_\_\_\_\_

Issued under Professional Services Agreement dated September 9, 2018.

To: Carollo Engineers, Inc.

**Project Description:**

2020/2021 Flow Monitoring and I&I Investigations - Professional Engineering Services.

**Description of Scope of Services to be performed by Consultant under this Task Order:**

See Exhibit 'A' – Scope of Services

**Description of Services to be Provided by District:** See Exhibit 'A' –Scope of Services

**Deliverables:** See Exhibit 'A' –Scope of Services

**Consultant Project Manager:** Ryan Orgill, PE

**Consultant Quality Control Manager:** Eric Harold, PE

**Schedule to Perform Services:** See Exhibit 'A' - Schedule

**Time & Materials Not-to-Exceed Cost Limit:** \$196,100

See Exhibit 'B' –Fee Schedule

**APPROVALS:**

**CAROLLO ENGINEERS**

By: \_\_\_\_\_  
Authorized Representative

\_\_\_\_\_  
Date

**NAPA SANITATION DISTRICT**

By: \_\_\_\_\_  
Purchasing Agent

\_\_\_\_\_  
Date

NSD Account No.: CIP 13705

# 2020/2021 FLOW MONITORING AND I/I INVESTIGATIONS

Napa Sanitation District

## Background

The Napa Sanitation District (Napa San) implements an annual infiltration and Inflow (I/I) investigation as part of their annual mitigation and rehabilitation program. The annual program includes basin isolation, pre and post rehabilitation flow monitoring, night-time I/I investigation, and additional inspection and rehabilitation recommendations. Napa San has requested that Carollo Engineers, Inc. (Carollo) work with V&A Consulting Engineers (V&A) to develop a scope of work to conduct the planning investigation and mitigation activities for the 2020/2021 wet weather season. The scope of work includes the following tasks.

## Scope of Work

### Task 1 – Project Management

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

#### *Task 1.1 - 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 report 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 1.1 Deliverables:

- Monthly status reports, invoices.

#### *Task 1.2 – Kickoff Meeting*

Carollo will conduct a kickoff meeting with Napa San staff to discuss the project objectives, communication protocols, review project, and summarize key project milestones and deliverables. The kick-off meeting will be held virtually, and will include the Carollo and V&A key project staff.

#### Task 1.2 Deliverables:

- Meeting Agenda, Action Item List and decision logs

### Task 2 – Temporary Flow Monitoring

The Carollo/V&A Team will provide temporary flow monitoring services for Napa San at fifteen (15) metering sites for a period of six (6) weeks. The sites will be selected based on Napa San direction and past V&A project experience. Carollo will develop figures illustrating the metering locations and the specific manholes used for the installation.

As part of the program, V&A will also install three (3) rain gauges to capture precipitation data for storm event classification and spatial rainfall distribution. V&A's complete scope of work is attached to this

document. This Task assume two project progress meetings to review site reconnaissance and flow data findings.

**Task 3 - Deliverable:**

- Electronic flow monitoring data spreadsheet deliverable

**Task 3 – I/I Investigations**

V&A will conduct four (4) I/I reconnaissance sessions to find and document infiltration and inflow sources within the targeted basins. I/I investigations involve night work, manhole inspection and clear flow documentation and tacking to identify and isolate infiltration and inflow in the collection system.

**Task 3 - Deliverable:**

- I/I investigation findings

**Task 4 – Project Reporting**

The Carollo will review and provide quality control for the flow monitoring and I/I investigation reports developed by V&A. Carollo will review the Draft reports for editorial content and technical elements. Carollo will submit the Draft Report to Napa San. Carollo will coordinate with V&A on inclusion of Napa San comments. Carollo will develop a comments and response log to track and coordinate Napa San comments on the Draft and Final reports.

**Task 4 - Deliverables:**

- Draft Flow Monitoring and I/I Investigation Report
- Final Flow Monitoring and I/I Investigation Report
- Comment and Response Log

**Task 5 – Optional Flow Monitoring Extensions**

The Carollo/V&A Team will keep the temporary flow monitors detailed in Task 2 in place and recording data for increments of two additional weeks. The flow monitoring extension will occur under specific direction from Napa San Staff. The associated fees for optional flow monitoring extension services will be \$500 per week per meter. This task will be divided into two sub tasks, each including two additional weeks of monitoring.

***Task 5a - Optional Flow Monitoring Extension - Two weeks (Week 6 to Week 8)***

This task includes monitoring for weeks seven (7), and eight (8) for a total of two additional weeks. Monitoring for the additional time will not be commenced until specific direction from Napa San.

***Task 5b - Optional Flow Monitoring Extension - Two weeks (Week 8 to Week 10)***

This task includes monitoring for weeks nine (9), and ten (10) for a total of two additional weeks. Monitoring for the additional time will not be commenced until specific direction from Napa San.

**Schedule**

The Carollo/V&A Team will install meters based on official notice to proceed from Napa San, which will occur after early season rains have saturated the ground and when favorable weather conditions are forecast. The Draft Flow Monitoring Report will be delivered within six (6) weeks of the completion of the monitoring. The Final report will be delivered within two (2) weeks of the receipt of Napa San comments on the Draft report.

V&A Project No. 20-0293

October 20, 2020

Tim Loper, P.E.  
Carollo Engineers, Inc.  
100 West Liberty, Suite 740  
Reno, NV 89501

**Subject:** Proposal for Year 2020/21 Flow Monitoring Services within the Napa Sanitation District

Dear Mr. Loper,

V&A Consulting Engineers (V&A) is prepared to conduct sanitary sewer flow monitoring for Carollo Engineers, Inc. (Carollo) within the Napa Sanitation District (District) at fifteen (15) flow monitoring sites and three (3) rain gauge sites for a period of six (6) weeks. V&A is prepared to conduct I/I reconnaissance, estimated at four (4) sessions, as directed by Carollo and the District. The following is our detailed scope of work for the subject services.

## Scope of Work

### Task | Description

- 1. Document Review, Equipment Preparation and Site Reconnaissance:** V&A will review existing sanitary sewer plans and documentation in preparation for flow monitoring. V&A will visit the proposed sites in order to verify suitability of manholes and/or alternative manholes for installation of flow meters. V&A will consult with the Carollo and the District in the event that alternative manholes are required for flow monitoring. V&A will document the following information: location map with address, pipe size, manhole identification number, flow channel condition, site schematics and photographs. V&A will recommend the appropriate metering technology for the flow characteristics and hydraulic conditions observed during the site reconnaissance visits.  
The site reconnaissance visit will document rain gauge placement areas, details and measures taken to eliminate undesirable influences of surrounding topography, vegetation, structures, etc. V&A will prepare flow monitoring and rain gauge equipment necessary for this project. As a portion of this task, V&A will supply and familiarize Carollo staff with past data and findings.
- 2. Flow Monitoring:** A V&A crew with a field truck and the necessary confined space, simple traffic control, and flow monitoring, pump station monitoring and rain gauge equipment will install, calibrate, and remove the meters and gauges. V&A shall be responsible for installation, calibration, and removal of the equipment for this project. Malfunction of meter operation will be documented and reported as soon as it is observed. V&A shall be prepared to extend or retract the duration of the flow monitoring period as required and directed by Carollo and the District. For this project, 15 flow meters and 3 rain gauges will be installed. The flow monitoring locations have been submitted by the District.
- 3. Flow Monitoring Deliverable:** Following the flow monitoring activities, V&A will prepare a report documenting the flow monitoring results. V&A shall download and reduce flow monitoring data in 15-minute intervals into Excel format for data analysis and report preparation. The summary report will be in hardcopy and electronic format and will include the following information:
  - A summary of the flow monitoring equipment used
  - Location map with address, pipe size, manhole identifier number, flow channel condition, site schematics, and photographs
  - Flow monitoring data with tabular outputs of depth, velocity and flow rate and hydrographs of

depth, velocity, and flow rates for the flow meter

- An electronic copy of monitoring data provided in 15-minute time intervals
- I/I Analysis: Average dry weather flow curves will be determined and rain dependent infiltration and inflow (RDI/I) response will be isolated during wet weather rainfall events. I/I analysis will include developing synthetic I&I hydrographs for each flow monitoring site and applying the synthetic hydrographs to a 10-year, 24-hour design storm. Pre- and post-construction data will be compared to determine the effectiveness of the construction work.

4. **I/I Reconnaissance:** V&A will investigate the manhole structures, sewer alignments, and other related sewer basin components, looking for evidence of infiltration and inflow. Work will likely be conducted during the low-flow hours of between 1:00 am and 4:30 am, when I/I flow is most evident (“clear-water” flow). Evidence of I/I that may be revealed during the investigations includes, but is not limited to, the following items: structural defects within manholes, visible tracking of I/I flow during a storm event, suspicious storm crossings, and direct connections from roof leaders into sanitary sewer clean-outs.

Limitations to this work include the following: (1) the source of I/I may not be traceable from this work; and (2) this work may be dependent on investigations taking place during storm events, which are unpredictable. Evidence of I/I will be documented and, whenever possible, evidence of I/I will be quantified. Depending on the characteristics and conditions unique to the basin(s) being investigated, investigative measures implemented may include general and/or detail reconnaissance, and/or basin isolation.

Depending on the timing of the field work in respect to the timing of the other deliverables required for the flow monitoring project, the data and information obtained will either be (a) compiled and merged with the data and work already completed in earlier phases of this project as part of an all-inclusive final report, or (b) submitted as a separate final report.

The deliverable will include a narrative about the methods used, and will include photographs, maps, graphs and tables, as necessary, to document and illustrate the results of the investigations.

It is currently anticipated to take 4 sessions of I/I reconnaissance to cover the following proposed areas:

- Vine Hill
- West F
- West Pine
- Downtown
- Coombsville

V&A proposes to complete this work on a lump sum per unit cost basis, shown as follows:

Item	Cost
Flow Monitoring, 15 sites for 6 weeks	\$ 88,200
I/I Reconnaissance: 4 Sessions @ \$7,950 per session:	\$ 31,800
<b>Total Base Cost:</b>	<b>\$120,000</b>
Optional Tasks:	
- Weekly extension of Flow Monitoring Period:	\$ 500 per-site per-week

If City permit fees are required (encroachment permit fees, traffic control plan permits, etc.), the cost of permits will be in addition to the stated costs for the flow monitoring. V&A assumes only simple traffic control set-ups (truck mounted light board and cones) will be required for this project. If complex traffic control set-ups requiring a traffic control contractor are deemed necessary, the costs of the traffic control contractor will be in addition to the stated costs for the flow monitoring.

Terms are Net 60 days. This fee is valid for 90 days from the date of this proposal. The scope of work was developed as a result of our discussion and represents our mutual understanding. If unforeseen circumstances should arise, which indicate that more work or more meters are required, we would provide a written estimate of the additional cost. We will not proceed with work beyond the not to exceed figure without written authorization from your office.

In the event of legislative actions by any level of government that impose any taxes, fees, or costs on V&A's services or other costs in connection with Work hereunder or compensation, such new taxes, fees, or costs shall be invoiced to and paid by the Client as a Reimbursable Expense. Should such taxes, fees, or costs be imposed, they shall be in addition to V&A's estimated total expenses.

We request that you carefully review this proposal to assure that we fully understand the scope of the work. We are prepared to begin work on your project upon receiving written approval, a Notice-to-Proceed, or purchase order.

On behalf of our staff and myself, I would like to thank you for the opportunity to be of service to you, Carollo Engineers, Inc., and Napa Sanitation District. We look forward to working with you.

Sincerely,

**V&A Consulting Engineers, Inc.**



Oliver Pohl, P.E.  
Project Manager

Accepted: \_\_\_\_\_

Date: \_\_\_\_\_

Carollo Engineers, Inc.



# Exhibit B



Task Description	Hours by Classification				Labor	Subs and Other Direct Expenses <sup>(1)</sup>	Estimated Fee
	Senior Professional	Lead Project Professional	Word Processing	Total Hours			
	Tim Loper	Ryan Orgill	Candice Padilla				
	\$293	\$230	\$125				
Task 1 – Project Management	24	16	4	44	\$ 11,200	\$ 600	\$ 11,800
Task 2 – Temporary Flow Monitoring	4	12	0	16	\$ 3,900	\$ 97,200	\$ 101,100
Task 3 – I/I Investigation	4	12	0	16	\$ 3,900	\$ 35,200	\$ 39,100
Task 4 – Project Reporting	10	16	2	28	\$ 6,900	\$ 400	\$ 7,300
Task 5a – Optional Flow Monitoring Extension - Two weeks (Week 6 to Week 8)	2	4	2	8	\$ 1,800	\$ 16,600	\$ 18,400
Task 5b – Optional Flow Monitoring Extension - Two weeks (Week 8 to Week 10)	2	4	2	8	\$ 1,800	\$ 16,600	\$ 18,400
<b>Total</b>	<b>46</b>	<b>64</b>	<b>10</b>	<b>120</b>	<b>\$ 29,500</b>	<b>\$ 166,600</b>	<b>\$ 196,100</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 \$13.00 per hour.
- (2) Subconsultant costs include 10% markup
- (3) Rates are based on 2020 billing rates