



# CITY OF NORTH PORT



## CONTRACT/AGREEMENT AMENDMENT FORM

Amendment No.: 1

City's Contract No./ Agreement No.: 2019-41

Commission Meeting Date: 12/10/2019

Purchase Order No.: 48071

Project Name: San Mateo Drive Water Transmission Main Project

Originating Department/Division: Utilities/Water

Point of Contact/Project Manager: Jennifer Fehrs

Contractor: Kimley Horn & Associates, Inc.

**Amendment required as a result of:**

- Changed/Unforeseen Conditions
- Errors and Omissions
- Change in Scope
- Time Extension/Deletion
- Change in Price (+/-)
- Owner's Request

**Please complete the following sections, and attach additional pages as necessary:**

**Explanation of Request (What is changing? Include effect on completion time):**

Additional services are required to update the current water hydraulic model, including revising demand data and a more accurate representation of system and facility upgrades in order to verify appropriate pipe sizing and the impacts to water age for the San Mateo project. The Consultant will also develop and oversee the execution of a hydrant testing plan and the data gathered will be used calibrate the model to more accurately represent the existing system conditions.

**Reason for Amendment (Why is it changing?):**

The water system model must be updated and calibrated in order to complete the water age analysis outlined in the scope of services of the original agreement. Due to a recent format conversion from Bentley WaterCAD to Innovzye InfoWater, the existing water hydraulic model has become confusing and inoperable. Furthermore, because it is based on outdated system and flow data from 2014, the existing model is not reflective of current water system. In order to size the San Mateo water mains appropriately and verify impacts to water age, updating the hydraulic model is essential.

**Attachments (list documents supporting change):**

- 1. Change Order No. 1 - Scope of Services

Please fill in the information below as applicable. You must double-click the chart to open in Excel before entering data.

Account Number	Project Number	Amount
420-6061-533.63-00	U19WSM	\$46,906.20

PURCHASING DIVISION  
CITY OF NORTH PORT  
11/13/2019 11:41

Amendment No.:1

City's Contract No./ Agreement No.:2019-41

CHANGE IN CONTRACT PRICE		CONTINGENCY FUNDS	
Please fill in the information below as applicable. You must double-click the chart to open in Excel before entering data.			
Original Contract Amount:	\$347,013.00	Use of Contingency Funds? (Yes or No)	No
Last Approved Amendment #	0	Original Contingency Amount:	\$0.00
Last Approved Change Order #	0	Approved Use of Contingency Amount:	\$0.00
Prior Approved Amount: Amendments	\$0.00	This (Decrease)/Increase:	\$0.00
Prior Approved Amount: Change Orders	\$0.00	Contingency Balance w/ this change approved:	\$0.00
Current Contract Price:	\$347,013.00		
This Change Add/(Deduct):	\$46,906.20		
Total Contract Amount w/ this change (pending approval):	\$393,919.20		

CHANGE IN CONTRACT TIME				
Please fill in the Initial & Final Dates of the Original Contract, and the Difference (days) for each subsequent amendment (the date will auto-fill for the amendment). Then fill in the corresponding Action and Basic Description. You must double-click the chart to open in Excel before entering data. There are extra rows hidden, and extra rows may be added if necessary.				
Initial Date	Final Date	Difference (days)*	Action	Basic Description
5/17/19	8/4/20	445 days	Original	Initial Execution
Total		445 days		
* Calendar days (not working days)				

RECOMMENDED:

By: [Signature] 11/8/19  
Contractor Date

By: [Signature] 11/8/19  
City POC/Project Manager Date

APPROVED:

By: [Signature] 11-12-19  
Department Director Date

By: [Signature] 11/13/19  
Budget Administrator Date

By: [Signature] 11-13-19  
Purchasing Date

By: [Signature] 11/13/19  
Finance Director Date

By: \_\_\_\_\_  
Assistant City Manager Date

By: \_\_\_\_\_  
City Manager Date

By: \_\_\_\_\_  
City Clerk Date

By: \_\_\_\_\_  
City Attorney Date

**ATTACHMENT A**  
**SCOPE OF SERVICES**  
**THE CITY OF NORTH PORT**  
**SAN MATEO DRIVE**  
**WATER TRANSMISSION MAIN PROJECT**  
**CHANGE ORDER NO. 1**

**PROJECT DESCRIPTION**

The City of North Port (City) owns a water system model (Model) that represents the North Port Utilities (NPU) water distribution system. The City recently converted the Model from Bentley® WaterCAD format to Innowyze® InfoWater. Based on discussions with the City, it was determined that the model conversion resulted in a confusing and inoperable model. Additionally, the Model was last updated in 2015 using 2013-2014 flow data. This is not necessarily reflective of the existing system considering proposed replacement of selected asbestos cement (AC) pipes, such as the San Mateo Water Main Replacement, and development within the West Villages Improvement District (WVID). The City has requested that Kimley-Horn & Associates, Inc. (Consultant), update the transferred City's InfoWater Model into a more useable tool that represents the system. The Model update will include revising demand data to be a more accurate spatial representation of the system and facility upgrades. In addition, the Model will be set up for extended period simulation and field verified to evaluate the validity of the City system's representation.

This scope of services includes the engineering tasks further described herein.

**SCOPE OF SERVICES**

**TASK 1: MODEL UPDATE**

The Consultant will update the newly transferred InfoWater Model with current demand and flow data. The City's customer Average Daily Demand (ADD) will be calculated and geolocated using the City's metering records and ESRI's ArcGIS for spatial demand assignment. The Average Daily Flow (ADF) scenario will be developed based on the geospatial allocation of demand data and Water Treatment Plant records to account for unaccounted-for water use. A Maximum Daily Flow (MDF) will be created based on demand and flow data provided by the City. After comparing the modeled ADF scenario and MDF peaking factor in the model with the updated demand data and revised peaking factor, the Consultant will discuss the findings with the City to finalize the factor and demands. The simulated distribution system will be updated with proposed AC pipe replacement segments. The Model will be refined to replace reservoirs at the WTP and booster stations with system tanks, including site piping and hydraulic losses. Services included in the Model Update will consist of the following tasks:

- A. Data Request, Collection and Review – Information on the existing system operating conditions will be requested of City. The data requested is anticipated to include but not be limited to: annual record of recent flow data, recent annual metering data, pump curves, tank and pump operational set points, AC pipe replacement areas and record drawings. In addition, hourly system data will be requested to aid in extended period patterns and development. The Consultant will collect and review the data provided by the City and prepare the data for incorporation in the Model. In addition, the Consultant will review existing system operations for application into the Model settings.
- B. Collect Flow Data, Calculate ADF and MDF and System Diurnal Patterns – A year of Water Treatment Plant (WTP), metering data and Interconnection flow data, provided by the City, will be collected and analyzed. The ADD and MDD will be calculated and determined from the metering data and will be used to spatially allocate the demand data based on located data records. The annual flow data will

be used to assign a non-revenue or unaccounted-for water demand assignment based on the provided records. A peaking factor will be calculated and discussed with the City.

- C. Diurnal Pattern Development and Assignment – The Consultant will develop diurnal curves based on two (2) weeks of hourly flow data during average day conditions and two (2) days of hourly flow data during a maximum day period provided by the City. After the ADF and MDF diurnal curves are developed, the patterns will be assigned to the Model.
- D. Demand Updates – The ADF and MDF will be calculated from recent annual flow records. The Modeled ADF and MDF will be updated to reflect the recent flows.
- E. Facility Updates – The Consultant will use the record drawings, provided operational setting and pump curves, to extract facility parameters. The Model will be updated with the simulated tanks, including ground, minimum and overflow elevations. The pump curves will be reviewed and updated from existing curves. From the record drawings, the piping will be added at the City's facilities. Based on current operations, the Model will be updated with appropriate initial set points for the existing conditions. The existing Model contains only Steady State conditions, or a snapshot in time. Therefore, the Model will not reflect tank cycling, etc. as typically required with Extended Period Simulation (EPS).
- F. Piping Updates – The existing Model will be updated to reflect recent AC pipe replacements. Other pipes currently modeled as 'Proposed' will be evaluated and updated, as applicable, to replicate existing field conditions.

## **TASK 2: MODEL CALIBRATION**

The Consultant will calibrate the Model to represent the existing system conditions to an acceptable level. The level of model calibration will be evaluated based on hydrant testing. Differential pressure and hydraulic grades will be compared and discussed with the City to ensure the level of calibration is appropriate for the City's use. A Hydrant Testing Plan will be developed and overseen by the Consultant to aid NPU Operations with the testing. Services included in the Model Calibration will consist of the following tasks:

- A. Hydrant Testing Plan and Execution – A hydrant test plan (Test Plan) map will be created by the Consultant for hydrant areas based on the layout of the Model/system. The Test Plan will be provided to the City for review and comment. After the Test Plan is accepted, the Consultant will oversee and record the hydrant testing while the City performs the testing.
- B. Model Calibration – The hydrant testing data will be used to calculate the flows the hydrants expelled during the testing. The Model will be assigned scenarios that represent the hydrant testing with hydrant flow data and system settings. The modeled scenarios calculations will be compared with the field data. In addition, the extended period simulation scenarios will be compared with average and maximum day SCADA data. The comparison will be reviewed with the City and discussed to be sure the Model represents the system to an acceptable level. Based on American Water Works Association (AWWA) M32, Manual for Water Supply Practices – Computer Modeling of Water Distribution Systems, a model is calibrated typically based on what the model will be used for. General guidelines for calibration goals is when the modeled Hydraulic Grade Line (HGL) is within 5 to 10 feet of the field HGL.
- C. Model Calibration Meeting – The Consultant will schedule and conduct a meeting with the City to discuss the Model Calibration.

### TASK 3: TECHNICAL MEMORANDUM

The Consultant will document the above tasks with a Technical Memorandum to summarize the work completed.

### METHOD OF COMPENSATION

The Consultant will perform these services for the total lump sum fee of \$46,906.20, inclusive of expenses. Invoices will be billed on a percent complete basis per task. The fee breakdown and schedule are defined below:

TASK	DESCRIPTION	FEE
1	Model Update	\$ 18,025.00
2	Model Calibration	\$ 21,156.20
3	Technical Memorandum	\$ 7,725.00
<b>TOTAL</b>		<b>\$ 46,906.20</b>

TASK	DURATION FROM NTP (DAYS)
NTP	0
1	90
2	180
3	240

### ADDITIONAL SERVICES NOT INCLUDED

- A. Hydraulic Model Analyses.
- B. Water Quality Modeling Analyses.

### NPU RESPONSIBILITIES

NPU will be responsible for the following;

- A. Providing utility staff familiar with the water main system for discussion.
- B. Operating hydrants for flow testing while Consultant records data.
- C. Providing data per the Data Needs Request of the existing facilities.

