

**VILLAGE OF TARRYTOWN
BOARD OF TRUSTEES
WORK SESSION 6:00 P.M.
WEDNESDAY, JANUARY 11, 2017
Tarrytown Village Hall
One Depot Plaza, Tarrytown, New York**

Board of Trustees Concerns

Open Session

1. Mobilitie, LLC – Small Cell Right-of-Way Permitting
2. Tarrytown Boat Club Lease
3. Crest Area Water District
4. Hotel/Motel Occupancy Tax Legislation
5. Trails Committee
6. Parking Permit Legislation

VILLAGE OF TARRYTOWN

INTERNAL MEMORANDUM

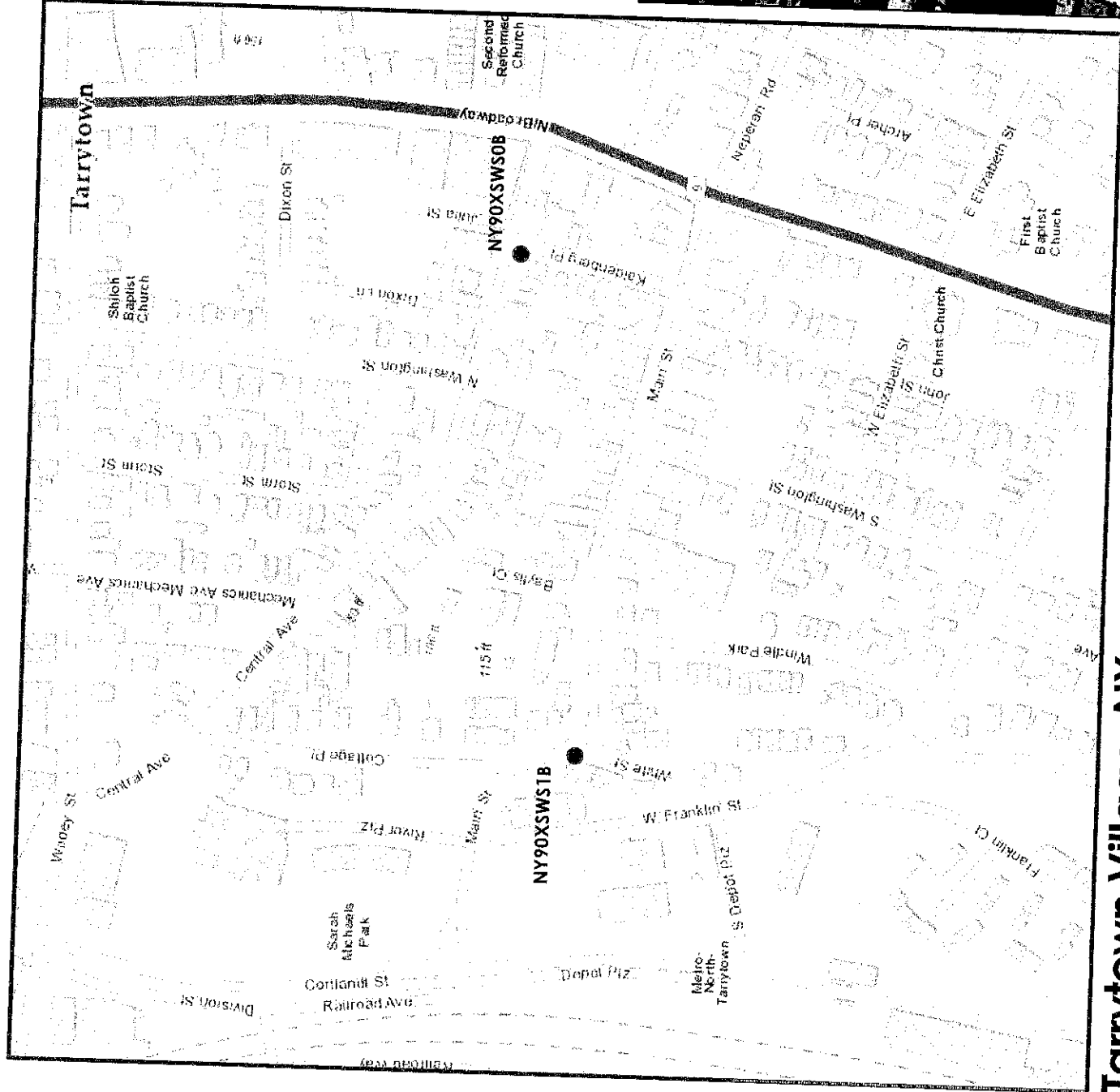
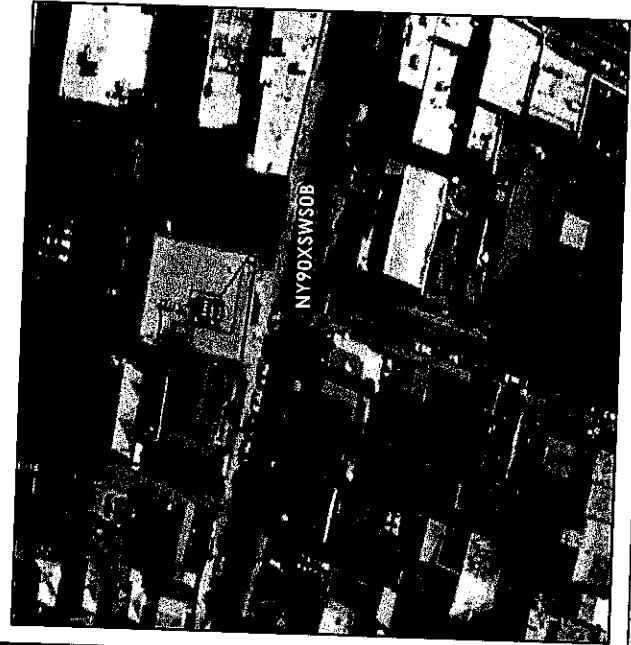
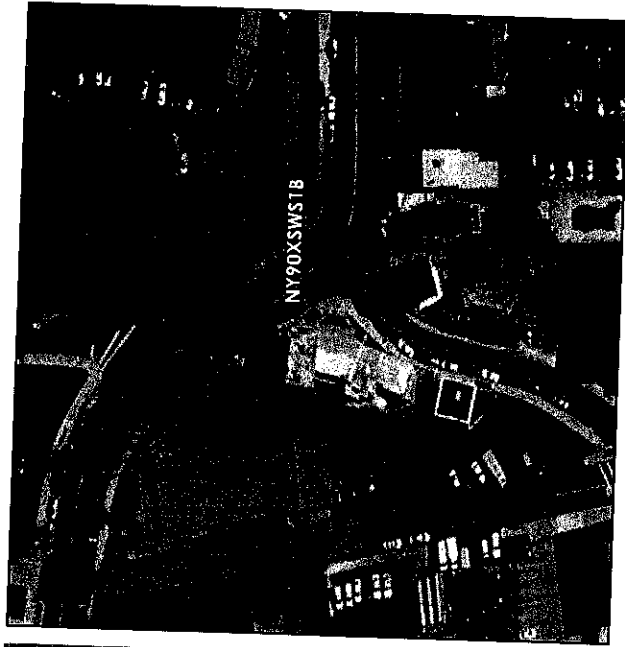
To: Mayor Fixell and the Board of Trustees

From: Michael Blau, Village Administrator

Date: January 4, 2017

Subject: MOBILITIE

Reference is made to the discussion at a previous work session regarding the request for "small cell" installation on two light poles in the Village. The Board had requested that I have the poles checked to determine ownership of the poles. I have completed that analysis and it turns out that the pole ending with the letters SOB is owned by Con Ed and the pole ending with the letters S1B is owned by Verizon (see attached map.) Once I had this information, I contacted the representative from Mobilitie who shared with me the pole attachment agreements that Mobilitie has with both Con Ed and Verizon. As such, the decision once again rests with the Board of Trustees as to whether or not you want to allow for the installation of the small cell sites in the Village. Included herewith I have included the original letter from Mobilitie, the photograph of a small cell site and other information provided by Mobilitie.



Mobilitie ID	Latitude	Longitude
NY90XSW51B	41.07702	-73.86273
NY90XSW50B	41.07744	-73.85883

Tarrytown Village, NY

• Small Cell, Attachment

mobilitie
intelligent infrastructure

Nov. 17, 2016



Mobilitie, LLC
594 Broadway
Suite 301
New York, NY 10012
Tel: 917.656.9083
www.mobilitie.com

November 18th, 2016

Michael S. Blau
Village Administrator
One Depot Plaza
Tarrytown, NY 10591

RE: MOBILITIE, LLC'S SMALL CELL RIGHT OF WAY PERMITTING

Dear Mr. Blau:

Per our conversation below is information about Mobilitie LLC and our proposed plan. I look forward to speaking with you on Monday.

ABOUT MOBILITIE

Mobilitie is the largest privately-held wireless infrastructure provider in the United States, helping people stay connected wherever they are. Mobilitie funds, installs, and operates indoor and outdoor neutral host DAS, Small Cell, and Wi-Fi networks, communication tower sites, as well as other infrastructure used by wireless carriers to enable high speed mobile communications.

MOBILITIE TRANSPORT NETWORK

Connectivity is becoming a vital component of daily life. Smart phones, smart appliances, autonomous vehicles, ride and vehicle sharing systems, and hundreds of internet connected devices need transport connectivity. Mobilitie is working with communities and carriers to construct new, hybrid transport networks through high-speed, high-connectivity bandwidth to meet the need for the next generation of devices, and data-driven services to meet the ever-growing demand for connectivity and smart transportation. As devices get smarter the cities, towns and villages that are connected and can meet this demand will grow. Specifically, Mobilitie is deploying two types of infrastructure: 1) Small Cell Sites and 2) Transport Sites. This infrastructure works together to form a network that will provide high-speed, high-capacity bandwidth.

SMALL CELLS SITES

Mobilitie's Small Cell Sites involves the installation of small, low-powered wireless facilities, consisting of a transmit-receive antenna that communicates with wireless devices, a wireless backhaul antenna that connects the facility to the carrier's core network, and compact radio equipment mounted on either new or existing utility or light poles. These Small Cells add coverage and capacity to the existing wireless networks, and are designed to blend with existing infrastructure.

Mobilitie would like to install two small cell sites within Tarrytown's right-of-way. Both sites would be attachment to existing street light poles. The first site is located at the second site intersection of Main and White Street is located on the corner of Kaldenberg Place and Central Avenue. Enclosed is a map of both locations and a preliminary construction drawing at the site of attachment for the Main Street site.



Mobilitie, LLC
594 Broadway
Suite 301
New York, NY 10012
Tel: 917.656.9083
www.mobilitie.com

TRANSPORT SITES

Mobilitie's Transport Sites consist of a 120' foot galvanized-steel utility pole supporting microwave dishes and radios that provide high speed connectivity to connect into wireless carriers' core networks, and ultimately into the internet. These Transport Sites optimize wireless carriers' networks by providing high speed bandwidth with the same speed and performance of fiber optic networks.

At this time, Mobilitie is proposing to two mini cell sites attached to existing light and utility poles in the Town of Tarrytown as reflected in the enclosed documents and one transport pole. Mobilitie values the input on our proposal, and will work closely with the Town Board to determine the optimal locations that balances the towns principles that guide the use and management of its rights-of-way.

We look forward to working with you and will be following up shortly to confirm receipt of the Applications. Please do not hesitate to contact me at 917-656-9083 or PCosta@mobilitie.com.

Thank you for your attention to this matter.

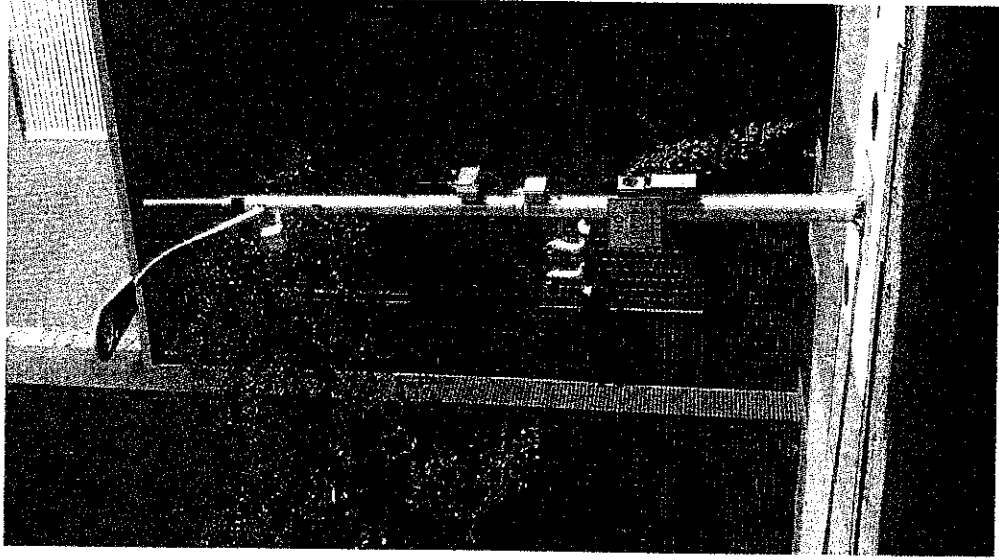
Respectfully submitted,

Paul Costa
Permitting Manager

Schedule of Enclosure and Attachments:

- A copy of construction drawings of the Main Street attachment site
- A map of the two proposed mini attachment sites

Small Cell Installations





Improved connectivity is coming to Tarrytown

Mobilitie develops intelligent infrastructure solutions to densify and optimize wireless carriers' networks and improve connectivity for citizens, business and visitors.

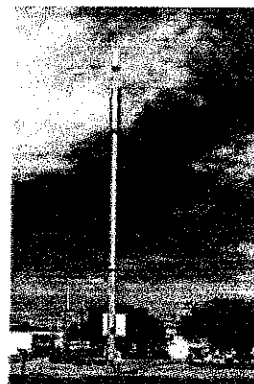
About the Deployment

Mobilitie is deploying a high-speed, high-capacity bandwidth network to facilitate the next generation of devices and data-driven services and meet the ever-growing demand for connectivity. The network consists of Small Cell and Transport facilities that are cost efficient and compact with no ground equipment. Small Cells are a vital component to the overall telecommunications network as they increase capacity and strengthen network connections to improve coverage. Transport facilities involve the installation of slim-line, galvanized-steel poles that connect and support data transfer from wireless device users into the wireless carrier's network. This network deployment is easily upgradeable to accommodate future technology.

MOBILE DATA TRENDS

- Mobile data traffic will grow 6-fold from 2015 to 2020, a compound annual growth rate of 42%
- Smart phones generate 41x more data traffic
- 30 Million MB of Data are used every 5 minutes through media streaming
- 56% of mobile data is video

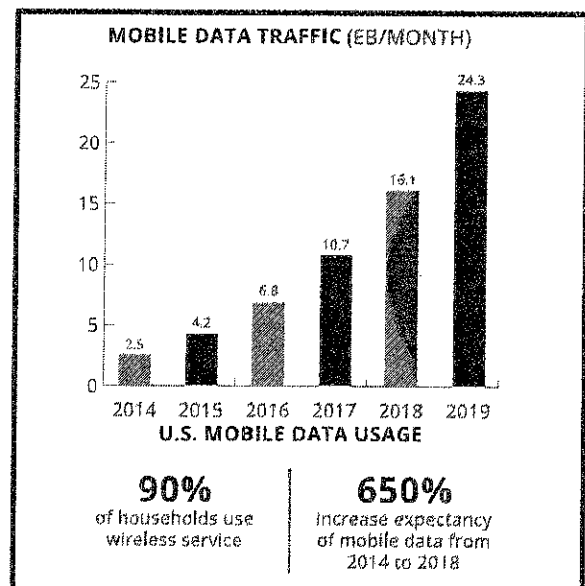
Source: Cisco VNI Mobile, 2016



Mobilitie Transport Pole
(George West, TX)



Mobilitie Small Cell Solution
(Los Angeles, CA)



MEMORANDUM

DEPARTMENT of PUBLIC WORKS

TO: Michael Blau, Village Administrator

FROM: Howard D. Wessells Jr., Superintendent of Public Works

DATE: 28 November, 2016

RE: Crest Area Water District

As you know, Professional Consulting LLC, (PCI) is the engineering consultant firm currently retained by the village to prepare the design bid documents for the water improvements in the Crest Area. The proposed improvements are necessary in order to provide increased water pressure within the "Crest" area of the village.

This planned design will create a separate pressure zone district within the existing water distribution system and includes; approximately one mile of new water main, several pressure reducing valves and/or check valves and a booster pump station, with an estimated cost of \$ 5,000,000 based on the engineer's opinion of probable construction cost.

In surmising from the numerous meeting discussions with our Consultant and, also with Dan Pennella, Village Engineer the current hydraulic water model being utilized by our consultant, PCI may be outdated. The data utilized to create the model, nearly two decades ago can produce skewed results since the demographics have changed.

With the high cost involved in the proposed water improvement project and the possibility that the design may be based on obsolete data, I have asked Woodard & Curran for a proposal to complete a new hydraulic model of the Crest Area.

Woodard & Curran has submitted a proposal in the amount of \$35,000 which represents 0.7% of the projected cost for separate pressure zone in the Crest Area. The scope of work for the modelling is to provide a current day hydraulic model accurately representing our water system in a format that can be utilized more easily by the Village and by multiple water consultants in the future.

I am recommending that this proposal as described in the scope of work be awarded to Woodard & Curran in the amount of \$35,000.

VILLAGE OF TARRYTOWN INTEROFFICE MEMORANDUM

TO: Michael S. Blau, Village Administrator
FROM: Donato R. Pennella, P.E., Village Engineer
RE: Woodard & Curran Proposal
DATE: December 28, 2016

A meeting was held with Howard Wessells, Superintendent of Public Works, Steven Robbins, of Woodard & Curran (W&C) and the author, to discuss the submission of a proposal for a new hydraulic water model for the water distribution system that would be in conjunction with the Crest Area improvements. Currently, the Crest water project is proceeding with a design of a pump station to address the low water pressure problems experienced by the residents.

Discussions regarding the current engineering design revealed that the results from the model created in the early 90's, currently being utilized, may provide skewed results due to the numerous system improvements and development that has occurred. It was suggested that Woodard & Curran provide a proposal to the village for a new water model for the entire water distribution system utilizing current data and review the Crest Area for alternate design scenarios. Woodard & Curran submitted their proposal for the preparation of a new and up to date water distribution model in the amount of \$35,000.

I have discussed this proposal with Howard Wessells, Superintendent of Public Works and reviewed the November 28, 2016 memorandum addressed to you with his recommendation to award this work to Woodard & Curran. I also, concur with his recommendation that this project is in the best interest of the village to bring the water distribution model to present day conditions.

If you have any questions, please contact me.

cc: Howard D. Wessells, Superintendent of Public Works

**COMMITMENT & INTEGRITY
DRIVE RESULTS**

709 Westchester Avenue | Suite L2
White Plains, New York 10604
www.woodardcurran.com

T 800.807.4080
T 914.448.2266
F 914.448.0147

Via Electronic Mail

September 14, 2016



Howard Wessells, Superintendent
Village of Tarrytown Department of Public Works
4 Division Street
Tarrytown, NY 10591

Re: Proposal for Engineering Services
Water System Modeling

Dear Howard:

Woodard & Curran is pleased to provide the Village of Tarrytown with this proposal to provide Professional Engineering services related to the development of a current Water System Model of the Village's water distribution system for the purpose of evaluating proposed improvements. Below please find our Project Understanding and proposed Scope of Work and Budget.

Project Understanding

The Village is in the process of evaluating hydraulic modifications for the Crest Drive area of its distribution system. When the High Service Tank level gets low and the pumping station is not in operation, this area reportedly experiences low pressure. The Village would like to understand if modifications to its existing pumping station, such as use of variable frequency drives, replacement pumps, or other options that would allow this portion of the system to have improved pressures while still allowing the High Service Tank to cycle to maintain water quality.

The Village would like to obtain an updated hydraulic model that can be more easily used by multiple consultants, as needed, to re-evaluate hydraulic options for the High Service Zone. Woodard & Curran has been provided an initial hydraulic model from the mid-1990's, and will use this as the basis for developing a new version of the model.

Scope of Services

Woodard & Curran will provide the following services as part of this project:

1. Kickoff meeting. We will schedule a kickoff meeting with Village staff to discuss the Village's distribution system, verify goals of the model development and hydraulic analysis, and to further identify areas of concern within the water distribution system.
2. Data Collection. At the kickoff meeting, the Village will provide the most recent available data for input into the hydraulic computer model. Woodard & Curran currently has some of this information, but we will verify the accuracy of our system understanding with the Village during the meeting. The data is requested in an electronic format, where possible. Where data is not available, we will discuss what appropriate assumptions can be made to develop the most accurate model possible. The data required to develop the hydraulic model includes:
 - a. Pipe network mapping data (electronically, if available) including, the following features and attributes:
 1. Water mains -- with physical descriptors such as diameter, length, material, lining, condition and year installed (if available).



- ii. Valves – with physical descriptors such as type, diameter, year installed and current status (open/closed).
 - iii. Facility locations – pump stations, storage tanks, control valves (including settings), interconnections, etc.
 - iv. Hydrant locations.
 - b. Source information including source pumping/metering data, pump curves, performance test data, on-off operational scheme, pressure trends, etc.
 - c. Distribution storage facility information including volume, geometry, base and overflow elevations relative to a known datum, typical operating level and daily level fluctuation data, if available.
 - d. Demand/consumption data – 2 to 3 years of monthly consumption data by account, along with customer type (residential, commercial, etc.).
 - e. Historical production data. Periodic flow information (every hour, etc.) delivered to water system. This information is used to develop demand patterns throughout the day, and to estimate the amount of unmetered/lost water.
 - f. Fire flow requirements – If the Owner or Insurance Services Office (ISO) has established fire flow requirements at various locations in the Village, this information will be collected and utilized in the analysis.
 - g. Past reports and test data (including C-value and fire flow) relating to the water system.
 - h. Historical hydrant flushing information.
 - i. Production and interconnection meter records.
 - j. Domestic, commercial and industrial water consumption and quantity of unaccounted-for/non-revenue water.
3. Development of a Village-wide Hydraulic Computer Model. Woodard & Curran will use the data obtained to update the existing computer-based hydraulic model of the Village's water distribution system. The following steps will be carried out to develop the model:
- a. Electronic Mapping – The model will incorporate the available hard-copy mapping data, any additional electronic mapping data obtained from the Village such as roadways, water main network, facility locations, etc. Elevations will be assigned to each node based on available topographic information. No field survey is included in this scope of services. The piping network will include all pipes 6-inches or greater in diameter; smaller diameter piping may be included on a specific basis, if needed, to complete loops, for example. Woodard & Curran proposes that once this step is complete that a workshop meeting be conducted with the Village's staff to perform a quality control review of the system layout and operations.
 - b. Demand Allocation – Allocation of the water demands within the hydraulic model will be established based on available metering and consumption data for the overall system.
 - c. Diurnal Patterns – Typical diurnal patterns for residential and non-residential customers will be initially input into the model. If information is available, a mass balance will be performed throughout the day, in order to adjust the initial diurnal curve patterns to match actual system data.
 - d. Initial Model Validation and Runs – The initial model runs are conducted to ensure that there are no connectivity issues and that the preliminary results are within a reasonable operating range.



- e. Quality assurance/quality control is an important component of the model development process. Documentation of the steps will be made, particularly of any assumptions made to simplify the model or operational strategies. These assumptions as well as the overall model will be carefully reviewed to ensure an accurate base model.
4. Model Calibration. Model calibration is the most important step in model development to confirm that the hydraulic model represents real-world conditions. Woodard & Curran will calibrate the model based on data obtained during hydrant flow tests and discussions with Village's staff. Our modeling team will work closely with Village staff to obtain general and specific knowledge of the system's operation. Calibration will be limited to the hydraulic system; no water quality (i.e., chlorine concentrations) calibration will be performed beyond water age analysis. The following steps are involved in completing model calibration:
 - a. Fire hydrant flow testing – Our modeling team will work with the Village to develop a plan to conduct one day of hydrant flow testing at locations throughout the system. Flow tests will be conducted to yield sufficient pressure change to calibrate the model. After the plan is approved by the Owner, Woodard & Curran will perform the tests with Owner's staff assistance. Additionally, four (4) data loggers will be deployed throughout the system to capture pressure data over a period of at least 24 hours, preferably longer, including the time frame of the hydrant flow tests. We have assumed that the hydrant flow testing program can be conducted during the day, and that no nighttime testing will be required.
 - b. Model Calibration – The fire hydrant flow test data, storage tank levels, pumping operations and any relevant interconnection data for each test will be input into the model and each scenario will be run. The model will be calibrated by making adjustments to the roughness coefficients and other parameters to match as closely as possible the pressures recorded in the field. A table of field data results and modeled results will be produced to indicate the calibration level.
5. Hydraulic Modeling Results and Recommendations. With the calibrated hydraulic model, the performance of the existing system will be assessed to identify any concerns or issues, particularly those associated with the items identified during the kickoff meeting. While our analysis will focus on Crest Drive, with the same model runs we will have the ability to evaluate several additional critical aspects of system operation. These analyses will include:
 - a. Crest Drive Hydraulic Options – Operational and physical system modifications will be identified to provide increased pressure to the Crest Drive area. This may include modifying the operation of the existing booster pump, water main modifications, and a separate hydraulic zone, depending on model results.
 - b. Extended period simulations (EPS) will be performed to assess optimal tank operations, as well as to estimate water age throughout the District's distribution system. EPS are critically important in the identification of possible issues with water quality due to poor tank turnover.
 - c. System Pressure – pressure at nodes throughout the system under all scenarios need to remain above 20 pounds per square inch (psi), system pressures under normal operation should remain between 35 and 80 psi. The instances and scenarios under which pressures in the Village's distribution system fall outside of this range will be identified.
 - d. Pipe Velocity – pipe velocities throughout the system will be examined to ensure they generally remain below the recommended maximum of 5 feet per second (fps) for long



lengths of piping. At times, shorter lengths of pipe may experience higher velocities without significantly affecting the system. The instances where velocities exceed the recommendation will be reviewed on an individual basis.

- e. Fire Protection -- available fire flow as determined by the calibrated model will be compared to the required fire flows provided by the Owner. System performance will be evaluated to identify areas where fire flow and resulting residual pressure may be deficient.
 - f. Water Distribution Redundancy and Looping -- Model results will be reviewed to ensure that there is sufficient system redundancy (in the form of pipe network looping) to perform within the recommended operational parameters, particularly under emergency situations.
 - g. Distribution Storage -- The amount of distribution system storage in the tanks, as well as the operation of the tanks, will be evaluated with respect to hydraulic grade line, altitude valve settings and installation, and turnover. Model results will be reviewed to ensure that sufficient storage capacity remains within the system to provide supply during emergency situations. Model results will also be reviewed to address storage tank turnover and refilling performance to consider potential water quality issues, especially with possible changes due to system modifications for Crest Drive.
6. Modeling Results Meeting. Once the existing system model evaluation is completed, Woodard & Curran will present and discuss the results of our analysis to the Village.
 7. Project Technical Memo. A project technical memorandum will be created outlining how the model was developed, calibrated and verified for accuracy and will include model input and output for the various scenarios evaluated as part of the calibration activities.

Schedule:

The Scope of Work specified herein will begin immediately upon authorization to proceed. It will be completed within three months.

Compensation:

For Services proposed herein, we propose a Lump Sum fee of \$35,000. Monthly invoices will be submitted to the Village on a percent complete basis for the previous month. Services will be provided in accordance with the most current Terms and Conditions between Woodard & Curran and the Village of Tarrytown.

Assumptions:

The scope of work and costs presented above are based on the following assumptions.

- No hydrant or building sprinkler system flow analysis will be performed to determine hydrant or sprinkler system flow or pressure requirements.
- Data required for model development as detailed herein will be made available to the Woodard & Curran.
- No survey will be performed for the purpose of determining elevation data across the Village. Elevation data to be used in the hydraulic model will be based on publicly available information and/or information provided to Woodard & Curran by the Village.
- Demand data for the hydraulic model will be determined as described in the scope of work.



- * Maintenance and protection of traffic, if required for traffic control during the field testing program, will be paid directly by the Village.

Thank you for this opportunity to submit this proposal and please feel free to call with any questions.

Sincerely,

WOODARD & CURRAN ENGINEERING P.A. P.C.

Anthony C. Catalano, P.E., BCEE
Principal

cc: Steven Robbins
Wayne Martin

Effective date: As of _____ 2016.

IN WITNESS WHEREOF, the undersigned have caused this Task Order to be duly executed by their authorized representatives set forth below.

VILLAGE OF TARRYTOWN

By: _____
Name: _____
Title: _____

WOODARD & CURRAN ENGINEERING, P.A., P.C.

By: _____
Name: Anthony C. Catalano, P.E.
Title: Principal

CAPITAL BUDGET - WATER FUND 2014 - 2015	
Crest Area Water System Improvements	
Design, surveying soil boring and testing fees (Project A, B and C)	\$230,000
Project A - Pump Station Construction	\$750,000
Project B - Distribution piping and control valves	\$1,000,000
Construction Management	\$60,000
TOTAL	\$2,040,000

CAPITAL BUDGET - WATER FUND 2016 - 2017	
Crest Area Water System Improvements	
Design, surveying soil boring and testing fees (Project A, B and C)	\$2,500,000
Total for Pump Station and Water Main Improvements	\$4,540,000