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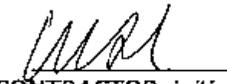
Town of Nags Head

Post Office Box 99
Nags Head, North Carolina 27959
Telephone 252-441-5508
Fax 252-441-0776
www.townofnagshead.net

NORTH CAROLINA
DARE COUNTY

SERVICE CONTRACT 20100592
PURCHASE ORDER #

**THIS CONTRACT IS NOT VALID WITHOUT THE REQUIRED ACCOMPANYING/
CORRESPONDING PURCHASE ORDER**


(CONTRACTOR initials)

THIS CONTRACT is made and entered into this the 15th day of MARCH 2010, by and between the TOWN OF NAGS HEAD, a public body corporate of the State of North Carolina, (hereinafter referred to as "the TOWN") party of the first part and DIEHL & PHILLIPS, P.A. 219 E. CHATHAM STREET, CARY, NC 27511, (hereinafter referred to as "CONTRACTOR"), party of the second part.

1. SERVICES TO BE PROVIDED AND AGREED CHARGES

The services and/or material to be furnished under this contract (hereinafter referred to collectively as "SERVICES") and agreed charges are as follows:

HYDRAULIC MODELING OF THE TOWN OF NAGS HEAD'S WATER DISTRIBUTION SYSTEM

Total contract price shall be \$22,000.00 (Twenty-Two Thousand dollars and no cents), in accordance with CONTRACTOR'S Engineering Services Proposal (Hydraulic Modeling task only) submitted on November 9 2009 (copy attached).

It is mutually agreed by and between the TOWN and CONTRACTOR that work under this contract will commence no later than MARCH 22, 2010. The contract completion date shall be JANUARY 1, 2011 with time being of the essence. If CONTRACTOR fails to complete work under this contract by JANUARY 1, 2011, the TOWN will be damaged thereby, and because the amount of the TOWN's damages, inclusive of expenses for inspection, superintendence and necessary traveling expenses is difficult if not impossible to definitely ascertain and prove, it is hereby agreed that the amount of such damages shall be \$50.00 as liquidated damages for every day's delay in finishing the work in excess of the completion date prescribed; and the CONTRACTOR hereby agrees that said sum shall be deducted from monies due the CONTRACTOR under the contract or, if no money is due the CONTRACTOR hereby agrees to pay to the TOWN as liquidated damages, and not by way of penalty, such total sum as shall be due for such delay computed aforesaid.

2. DESCRIPTION OF PROJECT

The engineer will computer model major pipes (6" and larger) in the distribution system utilizing Micro Hardy Cross. CONTRACTOR is experienced with and well qualified to use Micro Hardy Cross.

The modeling will consist of a number of "snapshots" of the system under a number of steady-state operating conditions. It is anticipated that the base piping network will be based on the existing model, as far as pipe lengths and diameters; CONTRACTOR will adjust the process as necessary as the project proceeds, and these lengths and diameters will be spot checked against existing record drawings for major mains, especially the 12" and 8" mains that contribute most to water transmission between the pumps and tanks. Major pipes that have been added since the last model will be included in the new model. C factors (roughness coefficients) will be field checked for major mains as described hereinafter. System demands. And where to locate these demands in the model will require significant input by town staff; water billing information will be need to be compiled for significant water users, and estimated of peak demands by these users will need to be a joint effort by town staff and the engineer. After the model is running, it will be calibrated by datalogging pressures at various locations in the system, as selected in a joint effort by town staff and the engineer.

The hydraulic modeling will include running the model with the following operational conditions:

- Average daily flow (ADF) with no pumps running
- ADF with all combinations of pumps running
- Max day flow (MDF) with no pumps running
- MDF with all combinations of pumps running
- Estimated Max hour flow (MHF) with no pumps running
- MHF with all combinations of pumps running
- The above 3 scenarios that have pumps running will be modeled with the altitude valve open and closed.

A complete printout showing flows in all modeled pipes, c factors used for modeled pipes, headloss in all modeled pipes, pressures at all nodes, modeled demands at all nodes will be provided for all the above operating scenarios.

A setup drawing that shows all pipes, pipe numbers, nodes, tanks, and pumps, etc. will be provided.

A digital copy of the model with all the above model simulations will be provided, including a copy of Micro Hardy Cross registered in the name of the Town of Nags Head, as well as a user's manual for the program. The engineer will provide 8 hours of training to town staff in how to use the program, and the training will include some basic hydraulic analysis training. This 8 hours of training can be broken down into two four hour sessions a month or so apart if desired by Nags Head; this will help town staff by answering questions that arise after working with the model and program.

The actual operating conditions of the existing pumps will be field evaluated, so the model can be properly calibrated. The operating conditions of the pumps will be compared to the manufacturers pump curve, and the engineer will make a written observation as to the pump's performance.

During the study period, the engineer will make field trips to perform c factor testing on selected portions of the distribution system. It is anticipated that most of this c factor testing will take place during the normally scheduled system flushing that the town performs in the winter. The engineer will need assistance from the town staff with hydrant flowing and residual pressure gauge reading during this c factor testing. The owner should expect some system disturbance during this testing, as hydrants will be opened to full flow; similarly, there may be some soil disturbance near some hydrants that the owner may need to repair after the hydrant flowing is completed. The engineer will focus this c factor testing on major lines that are used to transfer large volumes of water to the tanks, as these are the critical pipes as far as the model is concerned.

A written report will be provided that includes a summary of the hydraulic modeling as well as a copy of the model setup map and copies of the data output for the various scenarios that were modeled. The engineer will make recommendations as to operating modifications that will improve the hydraulic performance of the distribution system.

3. TERM OF CONTRACT

The term of this CONTRACT for SERVICES is from MARCH 15, 2010 to JANUARY 31, 2011. Either party may nonetheless cancel this contract on thirty (30) days written notice to the other party by certified mail or personal delivery. This contract is subject to the availability of funds to purchase the specified SERVICES and may be terminated at any time if such funds become unavailable.

4. PAYMENT TO CONTRACTOR

The TOWN agrees to pay at the rates specified for SERVICES satisfactorily performed in accordance with this contract. Unless otherwise specified, the CONTRACTOR shall submit an itemized invoice to the TOWN by the end of the month during which SERVICES are performed. Payment will be processed promptly upon receipt and approval by the TOWN of the invoice.

5. INDEPENDENT CONTRACTOR

Both the TOWN and the CONTRACTOR agree that the CONTRACTOR shall act as an independent contractor and shall not represent itself as an agent or employee of the TOWN for any purpose in the performance of the CONTRACTOR'S duties under this contract. Accordingly, the CONTRACTOR shall be responsible for payment of all Federal, State and local taxes arising out of the CONTRACTOR'S activities in accordance with this contract, including by way of illustration but not limitation, Federal and State income tax, Social Security tax, Unemployment Insurance taxes, and any other taxes or business license fees as required.

In performing the SERVICES, the CONTRACTOR is acting as an independent contractor and shall perform SERVICES in accordance with currently approved methods and practice in the CONTRACTOR'S professional capacity and in accordance with the standards of applicable professional organizations and licensing agencies.

6. INSURANCE AND INDEMNITY

The CONTRACTOR shall indemnify and save harmless the TOWN, its agents and employees from and against all actions, liability, claims, suits, damages, cost or expenses of any kind which may be brought or made against the TOWN or which the TOWN must pay and incur by reason of or in any manner resulting from injury, loss or damage to persons or property resulting from negligent performance of or failure to perform any of its obligations under the terms of this CONTRACT.

The CONTRACTOR shall be fully responsible to the TOWN for the acts and omissions of its sub-contractors and of persons either directly or indirectly employed by it, as the CONTRACTOR is for the acts and omissions of persons directly employed by it.

In addition, the CONTRACTOR shall comply with the North Carolina Worker's Compensation Act and shall provide for the payment of workers' compensation to its employees in the manner and to the extent required by such Act. In the event the CONTRACTOR is excluded from the requirements of such Act and does not voluntarily carry workers' compensation coverage, the CONTRACTOR shall carry or cause its employees to carry adequate medical/accident insurance to cover any injuries sustained by its employees or agents during the performance of SERVICES.

The CONTRACTOR agrees to furnish the TOWN proof of compliance with said Act or adequate medical/accident insurance coverage upon request.

The CONTRACTOR upon request by the TOWN shall furnish a Certificate of Insurance from an insurance company, licensed to do business in the State of North Carolina and acceptable to the TOWN verifying the existence of any insurance coverage required by the TOWN. The Certificate will provide for sixty (60) days advance notice in the event of termination or cancellation of coverage.

7. HEALTH AND SAFETY

The CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all employees from the work and other persons who may be affected thereby.

8. NON-DISCRIMINATION IN EMPLOYMENT

The CONTRACTOR shall not discriminate against any employee or applicant for employment because of age, sex, race, creed, or national origin. The CONTRACTOR shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their age, sex, race, creed, or national origin. In the event the CONTRACTOR is determined by the final order of an appropriate agency or court to be in violation of any non-discrimination provision of federal, state or local law or this provision, this Contract may be cancelled, terminated or suspended in whole or in part by the TOWN, and the CONTRACTOR may be declared ineligible for further contracts.

9. GOVERNING LAW

This contract shall be governed by and in accordance with the laws of the State of North Carolina. All actions relating in any way to this contract shall be brought in the General Court of Justice of the State of North Carolina or in the Federal District Court for the Eastern District of North Carolina.

10. OTHER PROVISIONS

This Contract is subject to such additional provisions as are set forth in any addendum executed separately by each party and attached hereto.

11. CONTRACT DOCUMENTS/AMENDMENTS

This document together with the purchase order and any attached exhibits constitutes the entire Contract between the said two parties and may only be modified by a written mutual agreement signed by the parties and attached hereto. In the event of any conflict between this contract and any attached documents, the contract language will prevail.

12. SIGNATURES

Both the TOWN and the CONTRACTOR agree to the above contract.

Witnessed or Attested By:

Michelle H. [Signature]



TOWN OF NAGS HEAD

By: [Signature]

Title: Town Manager

Date: 3-22-10

[Signature]
Jeff Beehler
Corporate Seal:

CONTRACTOR

By: [Signature]

Printed Name: John F. Phillips

Title: Secretary-Treasurer

Date: March 16, 2010

"This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act."

[Signature]
Finance Officer

APPROVED AS TO FORM AND LEGAL SUFFICIENCY.

[Signature]
TOWN ATTORNEY

**ENGINEERING SERVICES PROPOSAL
NAGS HEAD MASTER WATER PLAN UPDATE**

PREPARED FOR:

**NAGS HEAD PUBLIC WORKS DEPARTMENT
2200 S. LARK AVENUE
P.O. BOX 99
NAGS HEAD, NC 27959-0099**

PREPARED BY:

**DIEHL & PHILLIPS, P.A.
219 E. CHATHAM STREET
CARY, NC 27511**

NOVEMBER 9, 2009

Please review the proposal, and if you have any questions, you can call me at 252-312-6110 or email me at wediehl@hotmail.com. If the proposal is satisfactory, please let me know, and I will mail or deliver a hard copy and an engineering agreement.

Sincerely,

Diehl & Phillips, P.A.

William C. Diehl, P.E.

Cc: J. Fred Hill

SCOPE OF SERVICES HYDRAULIC MODELING

The engineer will computer model major pipes (6" and larger) in the distribution system utilizing Micro Hardy Cross. Micro Hardy Cross is a modeling program that is fairly simple to use, and I have used it for probably 20 years or so on literally hundreds of models, from large municipal water systems, county-wide water systems, sewage pump stations, etc. I have obtained excellent results from the model, with good correlation with actual system operating conditions. You can get more information about this modeling software by doing a web search for Micro Hardy Cross.

The modeling will consist of a number of "snapshots" of the system under a number of steady-state operating conditions. At this point, it is anticipated that the base piping network will be based on the existing model, as far as pipe lengths and diameters; these lengths and diameters will be spot checked against existing record drawings for major mains, especially the 12" and 8" mains that contribute most to water transmission between the pumps and tanks. Major pipes that have been added since the last model will be included in the new model. C factors (roughness coefficients) will be field checked for major mains as described hereinafter. System demands, and where to locate these demands in the model will require significant input by town staff; water billing information will need to be compiled for significant water users, and estimates of peak demands by these users will need to be a joint effort by town staff and the engineer. After the model is running, it will be calibrated by datalogging pressures at various locations in the system, as selected in a joint effort by town staff and the engineer.

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A setup drawing that shows all pipes, pipe numbers, nodes, tanks, and pumps, etc. will be provided.

SCOPE OF SERVICES
SYSTEM UPGRADES

Upon completion of the water system modeling, the results will be reviewed to determine areas of the water system that may have inadequate line sizes. Due to the fact that the results of the hydraulic modeling will determine how many areas may need upgrades, it is suggested that this work be performed on a unit price (hourly) basis. For budget purposes, it is estimated that this work item will cost about \$2000.00.

SCOPE OF SERVICES
FIRE PROTECTION

Upon completion of the water system modeling, the results will be reviewed to determine areas of the water system that may have inadequate fire flows. Additional flow testing and additional model runs may be needed to obtain baseline data, and Nags Head PWD may want information on system upgrades, with cost estimates as a part of this fire protection analysis; there also may be meetings involving the fire department. It is suggested that this work be performed on a unit price (hourly) basis. For budget purposes, it is estimated that this work item will cost about \$3000.00.

SCOPE OF SERVICES DISINFECTION BY-PRODUCTS

Systems that purchase water, such as Nags Head PWD, are dependent on their supplier to produce a high quality product and maintain that quality through the interconnection. This requires a joint effort and diligence from all parties.

To reinforce this focus, we urge routine contact between all parties (Nags Head, Manteo, Kill Devil Hills and Dare County Water) in the Dare County Regional water system, including full disclosure of treatment efficiencies and process alterations as well as water quality data from routine and compliance sampling within the respective distribution systems. As we approach EPA's Stage 2 DBP regulations we must maintain open communication. We suggest the respective Public Works and Distribution and Water department managers meet early in 2010 to establish mutual water quality goals and discuss how these can be maintained. If possible, we prefer the first meeting be hosted in Nag's Head, perhaps at Town Hall or the Fire Department. Subsequent meetings may be rotated among the parties on a semi-annual basis.

Purchasing systems must be aware of water quality entering the system and manage DBP formation within the distribution network. Nags Head PWD staff currently address this by frequently flushing low flow areas within the system and have installed blow-off devices to reduce residence time at dead ends.

Nags Head has not experienced problems with excessive HAA(5) in their distribution system, but T-THM's have been of concern. We suggest monthly "special-non compliance" monitoring at the Gull Street and 8th Street entry points to verify T-THM levels, and further suggest additional water quality monitoring for total hardness (CaCO_3), Coliform, Total Organic Carbon (or UV-254 as a surrogate), conductivity, chlorides, and free and total chlorine. Most can be performed in the Town's WTP lab at little expense. This information will provide documentation about incoming water quality and should be helpful for further system evaluation.

In addition, special samples for the same analytical parameters should be collected quarterly from (a) the outlet of each of the Town's ground storage tanks and (b) at least four locations within the distribution system (MRT & TCR sites) to determine changes in water quality that may occur at the tank sites versus those within the distribution system.

Sample results can be forwarded to D&P / JFH electronically for compilation, review and discussion.

ADDITIONAL ENGINEERING SERVICES

Diehl & Phillips, P.A. will provide additional engineering services beyond those services described in the Scope of Services as specifically requested in writing by Nags Head Public Works at the following rates. These hourly rates will be valid until December 31, 2010. Estimates of fees will be provided before work begins if desired by Nags Head Public Works.

- Senior Engineer (William C. Diehl, P.E.) \$115/hour
- Project DBP Consultant (J. Fred Hill) \$80/hour
- Project Engineer (D&P Staff Engineer) \$75-\$90/hour
- AutoCAD Technician \$65/hour
- Construction Observer \$65/hour
- Mileage Prevailing Federal Rate
- Expenses Direct Cost

Purchase Order Type Normal Fiscal Yr 2010 08 PO# 20100592
 Batch 123
 Requisition 000000594
 Department Code 810
 Allocation Code 0000
 Review Code
 Buyer ID wrightv
 Needed By Date 02/01/2010
 General Commodity
 Vendor 009426
 Work Order 000000000
 Activity

Water Operations

vicky wright

Ship To Address 17
 DIHRL & PHILLIPS P.A
 219 EAST CHATHAM STREET
 CARY, NC 27511
 NANCY CARAWAN
 NAGS HEAD WATER PLANT
 2200 LARK AVE
 NAGS HEAD, NC 27959

Ship To Reference 99
 Shipping Method hydralogic study for water sys
 Bill To Address None Status Released
 PO Description Distribution 1
 Special Handling

Total PO Amount \$22,000.00
 Liquidated \$ 0.00
 Canceled \$ 0.00
 Open Encumbrance \$22,000.00

Line Item Details

Line 001 Commodity
 Reg 594 QTY 1.0 UOM Each Unit Price 22000.00000
 % Disc 0.00 Credit 0.00 Freight 0.00

Qty Received 0.0
 Qty Canceled 0.0
 Line Item Total \$22,000.00
 Liquidated \$ 0.00
 Canceled \$ 0.00
 Line Item Open Encumbrance \$22,000.00

Description for hydralogic study of water system.

Department 810 1099 Box Fixed Asset N Needed By 02/01/2010
 Quote Bid
 Ship To Address 17

NANCY CARAWAN
 NAGS HEAD WATER PLANT
 2200 LARK AVE
 NAGS HEAD, NC 27959

Ship To Reference

Allocation Details
 Org 810 Obj 544000 Proj Description PROFESSIONAL FEES Encumbered Amt Bud \$22,000.00 U

03/22/2010 11:25
costeilk

TOWN OF NAGS HEAD
PO INQUIRY PROFILE REPORT

PG 2
po inquiry

Liquidated \$ 0.00
Canceled \$ 0.00
Allocated Open Encumbrance \$22,000.00

** END OF REPORT - Generated by Karen Costello **
