



**Solicitation Information**

**Date September 18, 2012**

**RFP # 7458083**

**TITLE: Engineering Services for Hydraulic Model Maintenance and Capital Improvement Projects**

**Submission Deadline: October 22, 2012 @ 11 am (EST)**

Questions concerning this solicitation may also be e-mailed to the Division of Purchases at [rfp.questions@purchasing.ri.gov](mailto:rfp.questions@purchasing.ri.gov) no later than October 10, 2012 -**at 12 pm** (Eastern Time). Please reference the RFP # 7458083 on all correspondence. Questions received, if any, will be answered and posted on the Internet as an addendum to this solicitation. It is the responsibility of all interested parties to download this information.

<b>SURETY REQUIRED: No</b>
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<b>BOND REQUIRED: No</b>
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**Thomas Bovis, Interdepartmental Project Manager**

**Vendors must register on-line at the State Purchasing Website at [www.purchasing.state.ri.us](http://www.purchasing.state.ri.us).**

**NOTE TO VENDORS:**

**Offers received without the entire completed three-page RIVIP Generated Bidder Certification Form attached may result in disqualification.**

The new prevailing wage address is: [www.wdol.gov/dba.aspx#3](http://www.wdol.gov/dba.aspx#3).

**THIS PAGE IS NOT A BIDDER CERTIFICATION FORM**

## **SECTION 1 – INSTRUCTIONS AND NOTIFICATIONS TO OFFERERS:**

The Rhode Island Department of Administration/Division of Purchases is soliciting proposals for engineering services, for a 3 year period, from qualified respondents, and in accordance with the terms of this Request for Proposals and the State's General Conditions of Purchase.

This solicitation, and subsequent award, is governed by the State's General Conditions of Purchase, which is available at [www.purchasing.ri.gov](http://www.purchasing.ri.gov)

To access the State's General Conditions of Purchase, enter our website, click on RIVIP, then click on General Information and then click on Rules and Regulations. Once the Rules and Regulations are displayed, scroll to the bottom of the page and double click on Appendix A, which contains the State's General Conditions of Purchase.

The scope of work is described in Section 2 herein.

Potential respondents are advised to review all sections of this solicitation carefully and to follow instructions completely, as failure to make a complete submission as described elsewhere herein may result in rejection of the proposal.

Alternative approaches and/or methodologies to accomplish the desired or intended results of this procurement are solicited. However, proposals which depart from or materially alter the terms, requirements, or scope of work defined by this Request may be rejected as being non-responsive.

The State also reserves the right to award this project based on pricing alone.

All costs associated with developing or submitting a proposal in response to this Request, or to provide oral or written clarification of its content shall be borne by the respondent. The State assumes no responsibility for these costs.

**Proposals are considered to be irrevocable for a period of not less than sixty (60) days following the opening date, and may not be withdrawn, except with the express written permission of the State Purchasing Agent.**

It is intended that an award pursuant to this request will be made to a prime contractor, who will assume full responsibility for all aspects of the work. Joint venture and cooperative proposals will not be considered, but subcontractors are permitted, provided that their use is clearly indicated in the respondent's proposal, and that the subcontractor(s) proposed to be used are identified in the proposal and qualifications provided.

An original Proposal plus four (4) copies, including Standard Form 330 (available on the Purchasing Website on the Standard Forms page); other details including personnel, experience, and qualifications data may be provided. The State reserves the right to make an award or to reject any or all proposals based on what it considers to be in its best interest.

Evaluation of proposals will include consideration of competence and general experience to provide the required services; experience and qualifications of personnel; availability of personnel, equipment and facilities to perform expeditiously; past performance with respect to control of costs, quality of work, ability to meet deadlines; the submittal of a formal work plan; the fixed fee price (subject to further downward negotiation); and an hourly rate schedule by employee title for additional services that might be required beyond the original Scope of Work.

**Respondents are advised that reimbursable expenses, to include sub-consultant services, that may be included in the contract award resulting from this solicitation, shall not exceed architect/engineer's actual cost incurred x 1.04.**

**Persons or firms practicing Architectural and/or Engineering Services in the State of Rhode Island must possess a proper registration and Certificate of Authorization in accordance with Rhode Island General Laws.**

A copy of the current Rhode Island Certificate of Authorization for the firm and current Rhode Island registration(s) for the individual(s) who would perform the work must be included behind TAB 1 of each copy of the Proposal.

An offeror who does not have a current Rhode Island Certification of Authorization for the firm and current Rhode Island registration(s) must acknowledge non-compliance with this requirement and confirm in writing that, if selected for the project, will expedite acquisition of a Rhode Island registration(s) and Certificate of Authorization(s), the attainment of which will be required before an award will be made. The letter of acknowledgement must be included behind TAB 1 of each copy of the Proposal.

To acquire a Rhode Island registration(s) and Certificate of Authorization the Board of Design Professionals can be contacted as follows:

Board for Design Professionals  
One Capitol Hill (3<sup>rd</sup> Floor)  
Providence, RI 02908-5860  
Tel: 401-222-2565  
Fax: 401-222-5744  
Website: [www.bdp.state.ri.us](http://www.bdp.state.ri.us)

The respondent's Proposal may be disqualified and removed from consideration if the Proposal fails to include the required current Rhode Island Certificate of Authorization for the firm and current Rhode Island registration(s), or, in absence of these documents, to acknowledge need to acquire them prior to award if selected.

In accordance with Title 7, Chapter 1.1 of the General Laws of Rhode Island, no foreign corporation, a corporation without a Rhode Island business address, shall have the right to transact business in the state until it shall have procured a Certificate of Authority to do so from the Rhode Island Secretary of State (401-222-3040). *This is a requirement only of the selected vendor(s).*

Bidders are advised that all materials submitted to the State of Rhode Island for consideration in response to this request for Letters of Interest will be considered to be public records, as defined in Title 38 Chapter 2 of the Rhode Island General Laws, without exception, and will be released for inspection immediately upon request, once an award has been made.

Interested parties are instructed to peruse the Division of Purchases website on a regular basis, as additional information relating to this solicitation may be released in the form of an addendum to this RFP.

The respondent should be aware of the State's Minority Business Enterprise (MBE) requirements, which address the State's goal of ten per cent (10%) participation by MBE's in all State procurements. For further information, contact the MBE Administrator, at (401) 222-6253 or visit the website at <http://www.mbe.ri.gov>

Awards resulting from this Request will be subject to the State's General Conditions of Purchase, which are available through the Internet at [www.purchasing.state.ri.us](http://www.purchasing.state.ri.us).

Questions, in **Microsoft Word Format**, concerning this solicitation, may be e-mailed to the Division of Purchases at [rfp.questions@purchasing.ri.gov](mailto:rfp.questions@purchasing.ri.gov) no later than the date & time indicated on page 1 of this solicitation. Please reference RFP # **7458083 Engineering Services for Hydraulic Model Maintenance and Capital Improvement Projects** on all correspondence.

Responses to questions received, if any, will be provided, as an Addendum to this RFP, and posted on the Rhode Island Division of Purchases website at ([www.purchasing.state.ri.us](http://www.purchasing.state.ri.us)). It is the responsibility of all interested respondents to download this additional information. *If technical assistance is required to download, call (401) 222-3766.*

Proposals to provide the required services must be received by the Division of Purchases on or before **October 22, 2012 @ 11 am (EST)**. Responses (**a clearly marked original plus four (4) copies**) should be mailed or hand-delivered in a sealed envelope marked "RFP NUMBER: **7458083** to:

RI Dept. of Administration  
Division of Purchases, 2<sup>nd</sup> floor  
One Capitol Hill  
Providence, RI 02908-5855

NOTE: Proposals received after the above-referenced due date and time will not be considered. Proposals must be presented to the Purchasing Receptionist for check-in and time stamp prior to the bid opening date and time. Proposals misdirected to other State locations or which are otherwise not presented in the Division of Purchases by the scheduled due date and time will be determined to be late and may not be considered. Proposals faxed, or emailed, to the Division of Purchases will not be considered. The “official” time clock is located in the reception area for the Division of Purchases. **(Please be advised that Fedex/UPS do not always arrive by 10:30 am. We recommend you send your submission to arrive at least one day early)**

## **SECTION 2 – SCOPE OF WORK**

### **Background:**

The Pastore Center is a 300+ acre campus in Cranston, RI that has a water distribution system with 91,000 feet of pipe network that serves about 90 buildings. The Rhode Island Department of Administration has a mathematical hydraulic model of the Pastore Center Water Supply & Distribution system. The model was developed in 1997 by Pare Engineering Corporation utilizing AutoCAD®, CYBERNET® and KYPIPE2®. This model has been and will be used in the development of Capital Improvement Plans.

### **Deliverables:**

The scope of this solicitation entails:

1. Load the data disk, provided by DOA, with the hydraulic model onto a computer, and operate and maintain the Pastore model **for a period of 3 years.**
2. Upon request of DOA:
  - a. Provide CAD operator services to update the pipe network with changes provided by DOA staff. [ Assume 80 hours per year]
  - b. Run a computer simulation analysis of the model, and print pertinent data. [Assume three times per year]
  - c. Print Hydraulic Model Node & Pipeline Plan [Assume 4 maps per year]
  - d. Print Water Distribution System Map [Assume once per year]
  - e. Conduct hydrant flow test and report results. [Assume 2 hydrants per year]
3. Review/analyze the most recent 2010 – 2015 Capital Improvement Plan (CIP) attached and prepare an updated 2013 – 2018 CIP.
4. Provide construction bid documentation projects in the CIP as selected by DOA. These construction projects will be \$500,000 in 2013 and \$500,000 in 2014.

## **Supplement to the Scope of Work**

The following requirements of the Division of Purchases are additive to the agency's Scope of Work:

A. Payments to the Architect and/or Engineer

Payments on account of the architect and/or engineer's basic services shall be made monthly in proportion to services performed.

B. Reimbursable Expenses

Reimbursable expenses, when authorized in advance in writing by the State, will be paid to the architect and/or engineer on the basis of the architect and/or engineer's verified costs plus a fee not to exceed four percent (4%) of the total cost. Expenses shall include, but not necessarily be limited to, reproductions, postage and handling of drawings, specifications and other documents, excluding reproductions for the office use of the architect and the architect's consultants, rental of special instrumentation, and expense of any additional insurance coverage or limits, including professional liability insurance, requested by the owner in excess of that normally carried by the architect and the architect's consultants. Sub-consultant services and other approved reimbursable expenses shall also be paid at actual cost incurred plus 6% markup.

C. Energy Efficiency

Energy efficiency is an important consideration. If appropriate to the design of this project, the architect and/or engineer will collaborate with the National Grid Company to achieve any cost reductions possible from that company's rebate program for energy efficient design.

D. Mercury Reduction and Education Act – Rhode Island General Law, Chapter 23-24.9

The Architect/Engineer shall comply with provisions of this Act and make every effort to specify non-mercury containing products whenever non-mercury containing products are available as a suitable alternative.

The successful respondent shall be solely responsible for meeting all terms and conditions specified in the Request for Proposals and any resulting contract. The use of any subcontractors or other vendors must receive prior approval by the State. The Rhode Island Department of Administration shall reserve the right to clarify the terms and conditions of any proposal submitted. The respondent recommended for this award will be notified by the Department of Administration. A contract will be developed in

cooperation with the Rhode Island State Department of Administration and the award recipient that will incorporate a final work plan and schedule.

### **SECTION 3 - RESPONSE CONTENTS**

Respondents' submittals should be formatted as bound documents with 6 tabs, the contents of which are outlined below.

#### TAB 1

1. A completed, signed three page R.I.V.I.P. generated bidder certification cover sheet (downloaded from the R.I. Division of Purchases Internet home page at <http://www.purchasing.state.ri.us>.)
2. A copy of the current Rhode Island Certificate of Authorization (RICOA) for the firm and copies of current Rhode Island registration(s) for professionals who would perform the work. (Firms that do not have a RICOA or RI professional registration must include a letter acknowledging the intent and requirement to expeditiously acquire said Certifications.)
3. A completed and signed W-9 Form downloaded from the RI Division of Purchases Internet home page at [www.purchasing.state.ri.us](http://www.purchasing.state.ri.us) by clicking on RIVIP, then General Information and then Standard Forms.

#### TAB 2

1. An Executive Summary that highlights the contents of the Technical Proposal and provides State evaluators with a broad understanding of the offeror's technical approach and ability.
2. A Table of Contents

#### TAB 3

##### Staff Qualifications/Experience of the Respondent and project principals

Describe the Respondent's general experience as well as its experience and qualifications with projects of a similar size, scope and use. Identify the Project Manager, other consultants as well as other members of the project team. Use Standard Form 330 (available on the Purchasing Website) for this purpose.

#### TAB 4

##### Project Plan

This section shall describe the offeror's understanding of the State's requirement, including the result(s) intended and desired, the approach and/or methodology to be

employed, and a work plan for accomplishing the results proposed. The description of approach shall discuss and justify the approach proposed for each task, and the technical issues that will or may be confronted at each stage on the project. The work plan description shall include a detailed proposed project schedule (by task and subtask), a list of tasks, activities, and/or milestones that will be employed to administer the project, the assignment of staff members and concentration of effort for each, and the attributable deliverables for each.

In this tab respondent should explain how he plans to address the State's Minority Business Enterprise (MBE) goal of 10% participation of MBE's in all state procurements.

#### TAB 5

##### References

Respondents should identify a minimum of three references, including all current contact information, for whom the firm has provided hydraulic modeling services. Members of the selection sub-committee may contact these references and request an evaluation of the firm's performance. The States evaluation criteria for reference checks on this project are provided in section 4 below.

#### TAB 6

##### Cost Proposals

All respondents are expected to provide a lump sum cost proposals for the services and assumed quantities listed in Section 2 - "Deliverables". The cost proposal shall include a narrative for the project that includes the respondent's cost and fee structure for this project and the cost methodology used for all expenses related to the project and to provide justification for each line item. Any items that may represent costs outside of industry standards should be explained.

Respondents should also provide a **Schedule of Fees** that would be used as a basis for compensation for work related to this project, but is outside the scope described in Section 2. The final agreement will also stipulate that if the hours required by are less than 80 hours per year, the State will be billed according to the above **Schedule of Fees** only for the hours spent. This fee schedule should include unit costs for additional simulation runs, additional Node and Pipeline Plans and additional hydrant flow tests.

## SECTION 4 - EVALUATION AND SELECTION CRITERIA

The State will commission a Technical Review Committee, which will evaluate and score all proposals, using the following criteria:

<b>Criteria</b>	<b>Possible Points</b>
Staff Qualifications	10 points
Quality of Project Plan	15 points
References	10 points
Cost [ calculated as the lowest cost divided by this cost]	65 Points
<b>Total Possible Points</b>	<b>100 Points</b>

A Technical Review Sub-Committee will review all submissions. After review, one or more respondents may be invited to present to the sub-committee and answer questions. The successful vendor shall be solely responsible for meeting all terms and conditions specified in this request, their proposal and any resulting contract. Subcontractors must be approved by the State; however, it is the responsibility of the selected vendor to supervise and monitor the work performed by the subcontractor.

The successful vendor must agree to provide the contract deliverable by the dates established in the final work plan and schedule.

### Evaluation Criteria

#### Staff Qualifications/Experience of Agency and Project Principals –10 Points

Evaluate the respondent's experience with projects of a similar size, scope and use.

To what extent do the Project Manager and each consultant assigned to the project have the background and experience necessary for a successful project?

Are staff and consultants assigned to this project experienced with projects of similar size, scope and use?

How well does the proposal relate the Project team's ability to incorporate program goals and criteria into their work?

Project Plan –15 Points

Did the respondent analyze, interpret and discuss issues presented by the project in a manner likely to meet the needs of the client and other customers and end users?

Does the proposed program, study and reports appear sensitive to budget and time constraints?

How well does the plan address relevant problems and program issues?

To what extent does the plan identify both constraints and opportunities posed by this project?

Is the project timeline and schedule achievable (not overly optimistic or needlessly long)?

Does the plan address accomplishing the State’s MBE goal?

References – Past Performance – 10 Points

Were three references provided for projects of a similar size, scope and use to the proposed project?

Did the respondent’s final product provide a clear, comprehensive and useful analysis / design / documentation?

How well did the respondent identify problems and issues in a timely and complete manner?

How well were technical and budget issues balanced?

How well did the respondent research relevant technical and program issues?

Evaluate the respondent’s investigative process and reports characterized by effective communication, clear graphic and verbal presentations?

Did the project come in on time and on cost?

Did the respondent contribute to overruns?

Were there an excessive number of change orders?

Cost – 65 Points

Only the lump sum cost proposals for the services and assumed quantities listed in Section 2 - “Deliverables” will be used in the vendor selection process.

**Attachment: 2010 – 2015 Capital Improvement Plan**

**END**



**STATE OF RHODE ISLAND  
DEPARTMENT OF ADMINISTRATION**

**PASTORE CENTER  
CAPITAL IMPROVEMENT PROGRAM  
2010 - 2015**

**Prepared By:**

**C&E Engineering  
342 Park Avenue  
Woonsocket, RI 02895**

**March 2010**

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Pastore Center Water Supply System Map

## **SECTION 1.0 INTRODUCTION**

### **1.1 PURPOSE AND SCOPE**

The State of Rhode Island Department of Administration (DOA) has commissioned C&E Engineering Partners, Inc. (C&E) to prepare an update to the existing Capital Improvement Program (CIP) for the DOA's Pastore Center water supply and distribution system. The DOA's current CIP was prepared in 2000 by James J. Geremia & Associates, Inc. and was directed at identifying and prioritizing water system needs and improvements through fiscal year 2005. This 2000 CIP provided a program of capital improvement projects for replacement of existing and installation of new infrastructure as well as the cleaning and lining of approximately 17,000 linear feet of water main that was required to improve the water system's function, operation and maintenance.

Through the 2000 CIP, the DOA sought to implement projects that were aimed at improving fire flow and redundancy within the water system. These projects were necessary to improve and maintain an adequate level of customer service. This included increasing pressure and flow, increasing system reliability and reinforcement of the transmission and distribution piping portion of the water system. This CIP continues to maintain consistency with the principles and goals of the DOA and its commitment to:

- Provide a consistent source of high quality, potable water for consumption and fire protection;
- Reduce long-term maintenance costs;
- Coordinate water system improvements to comply with local and federal guidelines for the management and operation of a public water supply system.

This CIP is a detailed plan for replacement of existing or installation of new infrastructure required to improve the water system's operation and maintenance. It provides the DOA with a plan for the scheduled and systematic approach to implementing both short-term (immediate) and long-term (out to 5-year) needs and requirements. This included an examination of

necessary improvements that are required in supply, storage, pumping, transmission and distribution systems that may be necessary to meet the needs of the water system.

The DOA routinely examines this capital program in order to re-prioritize, modify and update projects from previous CIP's and manage the water supply to support growth within the Pastore Center. As part of the preparation of this plan, the 2000 CIP was reviewed with consideration for those capital projects which have not been completed in order to evaluate their relative merit towards achieving the overall goal of water system improvement.

The CIP, in addition to describing and detailing the recommended projects, provides an estimated cost for implementation. This includes estimated budget costs for consideration of planning, design and construction. These cost estimates are required for the DOA to properly finance for both ongoing and planned capital projects. This process is intended to ensure that sufficient funding is available throughout the ongoing life of the capital program.

This CIP document includes:

- A description of the CIP and the evaluation process used to develop the program.
- Evaluation of the projects from the 2000 CIP which have not been implemented.
- A detailing of the capital systems, strategies, and programs highlighting key projects, anticipated costs over the next five years and comparison to the previous fiscal year and identification of its accomplishments.
- A description of each capital improvement project, including planned goals, justification, priority, impact on the operation budget, responsible section, in-service date, project cost, source of funds and cash flow.
- Mapping to graphically detail the location of the project in the service system.

## **1.2 CAPITAL IMPROVEMENT PROGRAM GOALS**

The DOA provides water and fire service to the Pastore Center located within the City of Cranston, RI. A primary goal of the DOA is to ensure that the Pastore Center is provided with a safe, reliable and adequate supply of water. To that end, this CIP is directed at providing the DOA with a defined plan of improving water supply efficiency, optimizing transmission from wholesale sources, necessary infrastructure redundancy and identification of water system improvements necessary to meet existing and anticipated future system needs.

It is imperative that capital facilities be planned and implemented in an orderly manner to ensure that all customers within the Pastore Center are afforded an adequate quantity of quality water while meeting all State and Federal safe drinking water standards.

This CIP for the DOA is premised upon the need to eliminate or reduce existing deficiencies, the ability to fund projects, and the need to implement projected requirements for capital facilities in order to ensure that the Pastore Center is supplied with an adequate quantity of high quality water. It is important that these capital improvements be planned judiciously, sufficiently funded and implemented on a timely basis to provide assurances of meeting these objectives.

This evaluation also considered those locations within the distribution system which realize substandard fire flows and pressures. The DOA recognizes that this could be the result of undersized or aged water mains, distances from wholesale supply sources or storage facility, customer service elevations or operational considerations with pumping facilities. The evaluation also considered the viability and effectiveness of existing facilities and where deemed necessary provided recommendation for either upgrade or new facilities that would be necessary to maintain a high level of water quality and supply reliability.

## **1.3 ASSESSMENT CRITERIA**

The measure by which the water supply, transmission and distribution system were assessed included recognized standard practices for water works design, publications and regulations

including the following: Ten State Design Standards – Recommended Guide for the Design of Water Works Facilities, American Water Works Association (AWWA) Standards, Rhode Island Department of Health Regulations, prudent engineering judgment and policy of the DOA.

In addition to the Ten State Design Standards and AWWA Standards, the following general criteria was utilized in assessing and evaluating projects:

1. Lay water service mains and sewer mains in separate trenches at least ten (10) feet apart. If conditions warrant that water service mains and sewer mains be laid in the same trench, the water service main shall be laid on a bench at least 18-inches above the top of the sewer main and 18-inches from the side of the sewer main.
2. The minimum cover applied to water mains and water service mains shall be five (5) feet.
3. Water mains shall be a minimum of ten (10) feet from any building or substantial utility structure (i.e. generator, etc.).
4. The minimum size of any water main shall be 8-inches in diameter.
5. The minimum size of any hydrant branch line shall be 6-inches in diameter. Lateral runs over 25 feet in length shall require an 8-inch diameter hydrant branch line.

Areas of system deficiencies were identified and recommendations for system improvements for both the short (immediate) and five (5) year planning horizon were quantified. Improvement projects deemed necessary to increase the reliability and operation of the water system will also be quantified.

## **1.4 PRIORITIZATION CRITERIA**

Prioritizing projects is a critical aspect of any capital program planning process. The project Prioritization Criteria provided below established a method to rate the relative importance of each of the individual projects. This rating criteria was premised upon a number of factors including protection of public health and safety, improving service conditions to consumers, regulatory requirements and the ability to provide and maintain adequate levels of service to existing and future customers.

This CIP will develop and establish specific evaluation criteria by which the adequacy of the water system will be evaluated. This will include identifying critical points where infrastructure is over “taxed” and would likely be incapable of operating in a manner to supply an adequate and safe reliable source of water supply to the DOA’s service territory.

The following is a listing of criteria that were utilized to evaluate water system performance and operation. The standards that were utilized consisted of those that are generally accepted in the water works industry and consist of the AWWA design and operational standards for water systems. These are considered to be general reference standards and do not replace “sound” engineering judgment or specific limitations with regard to a particular water system when making determinations to system adequacy. They do, however, establish a broad baseline for operation of a water system and generally serve to assess water system improvements and/or impacts to the system through expansion and growth.

Unusual circumstances, contractual obligations, system hydraulics, etc. may however preclude the use of these AWWA standards as the sole method to evaluate water system performance. The following are general criteria that were used in performing the evaluation.

1. Pipeline velocities shall be limited to 5 ft/s and head losses to less than 10ft/1,000 ft under the limiting demand condition for the pipe segment.
2. Fire flows within the water system shall not be less than 1,500 gallons per minute (gpm).

3. Pumping/Supply Capacity: The assessment of the supply capability shall be performed in the context that the pumping capacity shall be at minimum equal to the maximum daily demand of the system with the largest pump out of service.
4. Pressure Requirements: Generally, a required minimum static pressure under average day, maximum day and peak hour demand conditions of 35 pounds per square inch (psi) is considered adequate for water service.
5. Fire Flow Availability: The availability of fire flow is determined on a case-by-case basis. However, there are certain criteria that are critical to any fire flow evaluation. The needed fire flow must be met assuming a minimum residual pressure at the flow location of 20 psi. Also, there shall be no detrimental impact to other areas in the system as a result if fire flow assessment such as extremely low (less than 10 psi) or negative pressures.
6. System Storage: Water system storage is broken down into distinct components of a tank that provide water of various determined volumes for specific purposes. Each water storage tank typically comprises sufficient volume as follows:

“Equalization” storage

“Fire” storage

“Emergency” storage

“Equalization” Storage – The volume of water at the top portion above fire storage capacity. Equalization storage is that volume required to meet water system demands in excess of delivery capability of the pumping systems. It is the volume of the tank that typically cycles several times daily as system demands fluctuate. Therefore, the pumping supply and piping systems are sized to carry maximum day demands, and equalization storage is sized to meet demands in excess of the maximum day demand up to the peak hour demand

with a certain volume available for system growth. Equalization storage generally comprises up to half the total storage required and about 20 – 25% of the average day demand. These are, however, not strict requirements and a system's allocation may vary depending on demand and other system components.

For purposes of the DOA's system and based on the necessity to keep storage tanks within a relatively tight range to maintain system pressure and adequate reserve fire flow capacity, it is assumed for the purpose of this evaluation that low ranges of equalization shall be approximately 10 feet below maximum capacity.

“Fire” Storage – The volume of water situated below the equalization storage and above the emergency storage dedicated for fire protection. This volume is typically a function of the needed fire flow (NFF) requirements of the Insurance Services Office (ISO). Each storage facility should have sufficient fire storage volume to furnish NFF requirements within its area of influence. Additionally, it is required that the entire volume of the fire reserve be at an elevation of sufficient capacity to provide a 20 psi system residual pressure.

“Emergency” Storage – The volume of water situated below the fire reserve storage. Emergency storage provides for water during emergency situations such as pipeline and equipment failures, power outages, natural disasters, etc. The volume of water dedicated to emergency storage is an “owner-option”, based on an assessment of risk and desired degree of system dependability.

These criteria also provided a basis for decision making and in determining which projects would be implemented in any given year and for scheduling of projects over the five year span of the program.

The prioritization criteria provide a method that can be utilized to rank the projects in terms of relative importance for completion. There also exist outside factors, some of which are beyond the DOA's control that could affect the status of implementation for any particular project. Also, determinations from political and governmental oversight present unknown factors that in most instances are beyond the DOA's control. These determinations can affect funding and the status of implementation to any particular project. These include, but are not limited to: socioeconomic factors, regulatory agencies requirements and approvals, municipal and state government, DOA policy, funding availability and infrastructure condition.

The DOA is also cognizant of the need to periodically review and update its capital program and the necessity for such plans to be *dynamic* in nature while maintaining the ability to be restructured to meet the needs of the water system. Therefore, it is important that the DOA throughout the implementation of the program, periodically assess the relative merit of the coming year's projects. This assessment must weigh the need for the specific project as well as consider outside factors which could affect implementation of a specific project. These factors could affect the program and may require reconsideration of the schedule for implementation.

The following categories were utilized to categorize each of the projects. These reflect a range of priorities from high to low:

Priority 1 – Essential Projects

These include critical projects representing the highest priority of all capital projects. These projects meet one or more of the following criteria:

- Those projects deemed essential for providing reliable water supply to meet current and/or projected consumer demands. These generally include projects involving increasing available supply, fire protection, transmission and distribution and pressure.
- Those projects that are required by legislation, regulation, and/or for protecting the public health and safety and projects that are already under design or construction.

- Those projects which are deemed essential to meet the DOA's Strategic Plan, Policy or level of service goals funded by non-DOA sources such as developers or contractors.

#### Priority 2 – Necessary Projects

These include projects that must be completed, but for which the DOA has a moderate level of control as to when they should be performed. These projects generally meet the following criteria:

- Those projects which increase water supply reliability and improve delivered water quality.
- Those projects which maintain or improve level of service goals and/or operating efficiencies within the next five years.

#### Priority 3 - Discretionary Projects

These include all remaining projects that should be implemented to improve level of service goals, but for which the DOA has a significant level of control as to when they can be performed. For example, this could include projects related to installation of transmission or distribution mains required for redundancy, demolition or rehabilitation projects, etc.

### **1.5 EVALUATION PROCESS**

This project related to the preparation of a Capital Improvement Program for the DOA which detailed necessary improvements to be completed over a five (5) year planning period. This included evaluation of potential infrastructure improvements for the entire DOA water supply and service area.

The evaluation of capital infrastructure projects considered water system consumer demands for the current as well as the projected planning period (year 2015). By considering potential future

water demands within the service area, recommended CIP projects could be evaluated for their ability to maintain customer service level goals throughout the project planning period.

These projected water demands were assigned to the demand database of the DOA's computerized hydraulic model. The hydraulic model was utilized to assist in the evaluation of the water supply and distribution system and to assess potential CIP projects. This included consideration for current as well as future (year 2015) anticipated customer demands. The model simulations were intended to evaluate the effectiveness of the recommended CIP projects to meet anticipated consumer demands.

Additionally, the DOA's computer hydraulic model of the supply and distribution system was updated to include all recent (within past five years) infrastructure improvement projects which were implemented by the DOA. A review of the as-built condition plans for completed projects or available design plans for pending projects was performed. This update included consideration of the following projects.

- Division of Youth and Families Facilities

## 1.6 COST ESTIMATING

The costs estimated for the capital improvement plan are based on current dollar value with an annual escalation for inflation and were generated based upon the extent and size of the particular capital improvement project. The cost estimate for each project is presented as a distinct component which includes construction (i.e. the cost to physically construct the project).

### *Construction Costs*

Construction costs for similar recent water main projects were utilized to assist in estimating construction costs. These include unit prices for general water main installation in developed roadways which include pavement restoration (temporary, final trench and permanent overlay restoration).

The following unit costs for water main material and installation were utilized.

<u>Size (diameter)</u>	<u>Cost per Linear Foot</u>
8 inch	\$ 120.00
12 inch	\$ 140.00
16 inch	\$ 160.00

The following unit costs for water main cleaning and lining were utilized.

<u>Size (diameter)</u>	<u>Cost per Linear Foot</u>
6 inch	\$ 50.00
8 inch	\$ 60.00
12 inch	\$ 75.00

A unit cost of \$3,500.00 was utilized for a new hydrant assembly.

The costs identified above that are utilized herein are premised on data obtained from 2010 projects. These construction costs for similar type projects provide the best source of available information related to “actual bid” costs and were therefore utilized to develop costs for projects.

***Design and Related Construction Services Costs***

For purposes of developing design and related construction services costs, 15 percent of the cost of construction estimate was utilized. Design and related construction services costs include those costs associated with planning, preliminary and final design; geotechnical investigations, surveying and permitting; construction related services and representation. This percentage is considered a general industry standard for water works utility projects of this scale and complexity.

***Contingency Allowance Costs***

It is also necessary to include a contingency for unanticipated and unforeseen costs which could occur. This amount is added to the estimate to allow for items, conditions or events for which the condition, occurrence or effect is uncertain at this time and that experience shows will likely result in increased costs to complete the project. For purposes of developing an estimate for total project cost of construction a dollar value of twenty (20) percent of the anticipated total project cost (construction, design and related services costs) was utilized.

***Inflation Adjustment Factor***

In order to account for the increase in costs associated with goods and services, an annual inflation factor was utilized. Most recently, the escalating cost of energy and raw materials such as steel would have a significant impact on these type construction projects. Energy costs have more than doubled within the past several years and steel has risen upwards of twenty five percent (25%) due to increase in global demand. Historically, inflation has been in the range of two (2) to five (5) percent. For purposes of accounting for annual inflation four (4) percent compounded escalation factor shall be utilized.

**1.7 OVERVIEW OF CURRENT PROJECTS**

## **2.0 CAPITAL IMPROVEMENT PROJECTS – GENERAL**

All capital projects that are identified herein are presented in the following general format. A brief description of the contents of the sections is also provided.

### ***Project Description***

A description of the project including need for project, benefit, goals and objectives.

### ***Calendar Year for Implementation***

The year in which the project is anticipated to commence. The duration of the project may extend beyond the fiscal year in which it is initiated.

### ***Type of Project***

Project classification which includes new construction, rehabilitation or replacement as related to the following type of project: supply, storage, improvement of hydraulic capacity to meet existing and future domestic and fire flow demands, transmission and/or distribution water mains, level of service improvement, pumping or booster stations.

### ***Project Priority Category***

Identification of project priority and discussion (i.e. essential, necessary or discretionary type of project).

### ***Location Mapping***

Mapping depicting the general location of the project within the service territory.

### ***Total Anticipated Construction Cost***

Estimated statistical cost to implement the project in current dollars including construction, design and design related services, a twenty (20) percent contingency and a four (4) percent annual compound escalation factor for inflation. The design services include costs associated with conceptual, preliminary and final design, surveying permitting and geotechnical services.

## ***Project 1 – New 12-Inch Water Main on Howard Avenue***

### **Project Description**

Install approximately 300 feet of new 12-inch ductile iron water main on Howard Avenue from the intersection with Slate Hill Road to the area of Building 50 that also provides a looped connection, reinforces the distribution system, equalizes pressure and increases fire flow. A fire flow simulation was conducted utilizing the computerized hydraulic model of the Pastore Center. A total of 24 junctions in the area around Building 50 were evaluated. Currently, fire flows in this area range from 298 gpm to 3,000 gpm at residual pressures ranging from 20 psi to 56 psi. There are 5 junction nodes with fire flows below 1,000 gpm. With the installation of the 12-inch water main loop the fire flows in this area increase to a range of 380 gpm to 3,000 gpm at residual pressures ranging from 20 to 56 psi. There is 1 junction node with a fire flow below 1,000 gpm with the 12-inch water main loop in place.

### **Fiscal Year**

Anticipated - 2010

### **Type of Project**

This project is considered a necessary improvement to enhance water quality, eliminate the existing conditions of poor service to the existing customers and is consistent with the long term goal of the DOA to improve the identified deficient conditions of service in these areas.

### **Category**

Project is deemed *necessary* in order to improve fire flows in this area of the water system.

### **Location and Mapping**

See Figure 1

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 42,000.

## ***Project 2A – Clean and Line Existing Water Mains (Buildings 50, 51, 52, 54, 55 and 57)***

### **Project Description**

Clean and line approximately 5,014 linear feet of existing 8-inch water mains in the vicinity of Buildings 50, 51, 52, 54, 55 and 57. Cleaning of the existing water mains consists of a drag application that removes all rust, tubercles, deposits, loose or deteriorated remains of the original coating and other foreign materials. Lining of the existing water mains consists of a cement lining with a smooth, hard surface of uniform thickness.

### **Fiscal Year**

Anticipated - 2010

### **Type of Project**

This project will restore flow and carrying capacity of the existing water mains in this area and is consistent with the long term goal of the DOA to identify and improve service to these areas.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 2A

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$301,000.

## **Project 2B – Replacement of Existing Water Mains (Buildings 50, 51, 52, 54, 55 and 57)**

### **Project Description**

Replacement of approximately 1,056 linear feet of existing 6-inch water main in the area of Buildings 50, 51, 52, 54, 55 and 57 with new 8-inch water main. The replacement of these water mains will include the installation of new valves.

### **Fiscal Year**

Anticipated - 2010

### **Type of Project**

This project is considered an improvement to water quality, transmission water main and level of customer service and is consistent with the long term goal of the DOA to identify and improve overall water service.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 2B

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 127,000.

## **Project 3A – Clean and Line Existing Water Mains (Buildings 66, 70, 71, 72, 75, 76 and 152)**

### **Project Description**

Clean and line approximately 1,938 linear feet of existing 12-inch water mains in the vicinity of Buildings 66, 70, 71, 72, 75, 76 and 152. Cleaning of the existing water mains consists of a drag application that removes all rust, tubercles, deposits, loose or deteriorated remains of the original coating and other foreign materials. Lining of the existing water mains consists of a cement lining with a smooth, hard surface of uniform thickness.

### **Fiscal Year**

Anticipated - 2011

### **Type of Project**

This project will restore flow and carrying capacity of the existing water mains in this area and is consistent with the long term goal of the DOA to identify and improve service to these areas.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 3A

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 145,000.

## **Project 3B – Replacement of Existing Water Mains (Buildings 66, 70, 71, 72, 75, 76 and 152)**

### **Project Description**

Replacement of approximately 3,392 linear feet of existing 6-inch water main in the area of Buildings 66, 70, 71, 72, 75, 76 and 156 with new 8-inch water main. The replacement of these water mains will include the installation of new valves.

### **Fiscal Year**

Anticipated - 2011

### **Type of Project**

This project is considered an improvement to water quality, transmission water main and level of customer service and is consistent with the long term goal of the DOA to identify and improve overall water service.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 3B

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 407,000.

## **Project 4A – Clean and Line Existing Water Mains (Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100)**

### **Project Description**

Clean and line approximately 5,163 linear feet of existing 8-inch water mains in the vicinity of Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100. Cleaning of the existing water mains consists of a drag application that removes all rust, tubercles, deposits, loose or deteriorated remains of the original coating and other foreign materials. Lining of the existing water mains consists of a cement lining with a smooth, hard surface of uniform thickness.

### **Fiscal Year**

Anticipated - 2012

### **Type of Project**

This project will restore flow and carrying capacity of the existing water mains in this area and is consistent with the long term goal of the DOA to identify and improve service to these areas.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 4A

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 310,000.

## **Project 4B - Replacement of Existing Water Mains (Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100)**

### **Project Description**

Replacement of approximately 149 linear feet of existing 6-inch water main in the area of Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100 with new 8-inch water mains. The replacement of these water mains will include the installation of new valves.

### **Fiscal Year**

Anticipated - 2012

### **Type of Project**

This project is considered an improvement to water quality, transmission water main and level of customer service and is consistent with the long term goal of the DOA to identify and improve overall water service.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 4B

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 18,000.

## **Project 5A – Clean and Line Existing Water Mains (Maximum Industries, Jones Avenue, Power Road and Goddard Road)**

### **Project Description**

Clean and line approximately 2,005 linear feet of existing 8-inch water mains and 106 linear feet of existing 12-inch water mains in the vicinity of Maximum Industries, Jones Avenue, Power Road and Goddard Road. Cleaning of the existing water mains consists of a drag application that removes all rust, tubercles, deposits, loose or deteriorated remains of the original coating and other foreign materials. Lining of the existing water mains consists of a cement lining with a smooth, hard surface of uniform thickness.

### **Fiscal Year**

Anticipated - 2013

### **Type of Project**

This project will restore flow and carrying capacity of the existing water mains in this area and is consistent with the long term goal of the DOA to identify and improve service to these areas.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 5A

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 128,000.

## **Project 5B – Replacement of Existing Water Mains (Maximum Industries, Jones Avenue, Power Road and Goddard Road)**

### **Project Description**

Replacement of approximately 3,703 linear feet of existing 6-inch water main in the area of Maximum Industries, Jones Avenue, Power Road and Goddard Road with 1,862 linear feet of new 8-inch water main and 1,841 linear feet of new 12-inch water main. The replacement of these water mains will include the installation of new valves.

### **Fiscal Year**

Anticipated - 2013

### **Type of Project**

This project is considered an improvement to water quality, transmission water main and level of customer service and is consistent with the long term goal of the DOA to identify and improve overall water service.

### **Category**

Project is deemed *necessary* in order to improve domestic and fire flows in this area of the water system.

### **Location and Mapping**

See Figure 5B

### **Anticipated Construction Cost**

The estimated cost of construction for this project is \$ 481,000.

## **Project 6 – Install New Hydrant Assemblies**

### **Project Description**

The installation of new hydrant assemblies will improve fire flow within the water system. Each year a number of new hydrant assemblies will be installed within the water system. This will provide an increase in fire flows on a yearly basis and a more reliable water system throughout the Pastore Center.

The number of new hydrant assemblies to be installed each year are as follows:

#### ***Project 6A – Buildings 50, 51, 52, 54, 55 and 57***

Install 15 new hydrant assemblies

#### ***Project 6B – Buildings 66, 70, 71, 72, 75, 76 and 152***

Install 6 new hydrant assemblies

#### ***Project 6C – Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100***

Install 6 new hydrant assemblies

#### ***Project 6D – Maximum Industries, Jones Avenue, Power Road and Goddard Road***

Install 10 new hydrant assemblies

### **Fiscal Year**

Project 6A: Anticipated – 2010

Project 6B: Anticipated – 2011

Project 6C: Anticipated – 2012

Project 6D: Anticipated – 2013

**Type of Project**

This project is considered an improvement to fire flow capabilities and is consistent with the long term goal of the DOA to identify and improve overall water service.

**Category**

Project is deemed *necessary* in order to improve fire flows within the water system.

**Location and Mapping**

See Figure 6A – 6D

**Anticipated Construction Cost**

The estimated cost of construction for this project is as follows.

Project 6A - Buildings 50, 51, 52, 54, 55 and 57	\$ 53,000
Project 6B - Buildings 66, 70, 71, 72, 75, 76 and 152	\$ 21,000
Project 6C - Buildings 83, 86, 87, 89, 93, 94, 95, 96, 97 and 100	\$ 21,000
Project 6D - Maximum Industries, Jones Avenue, Power Road and Goddard Road	\$ 35,000

Figures

Pastore Center Water Supply System Map

