GIS-CENTRIC EAM SOLUTION. CONDITION ASSESSMENT-DRIVEN. PUBLIC WORKS INFRASTRUCTURE EXPERTISE.

ENTERPRISE ASSET MANAGEMENT SYSTEM RFP NO. 475-11780



City of Fort Lauderdale

June 6, 2017

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CAM #18-0085 Exhibit 3 1 of 173 6 June 2017

Althea Pemsel, MA, CPSM, Senior Procurement Specialist City of Fort Lauderdale, Procurement Services Division 100 N. Andrews Avenue, #619 Fort Lauderdale, FL 33301

Dear Ms. Pemsel,

RE: RFP No. 475-11780: City of Fort Lauderdale Enterprise Asset Management System

The City of Fort Lauderdale (City) is a forward-thinking municipality with longterm aspirations and a strong vision, as documented in its five-year Strategy Plan, *Press Play Fort Lauderdale*, and Vision Plan, *Fast Forward Fort Lauderdale* 2035. As part of the "We are Ready" strategy in the Vision Plan, *the City plans to become a safe and resilient community through the development of sustainable public works infrastructure*, which includes water, sewer, and stormwater systems, so it can continue to deliver an excellent level of service.

The City's Public Works infrastructure has been in operation for over a century and as a result, its deteriorating and in need of rehabilitation and replacement (R&R). For example, the aging sewer infrastructure has resulted in unauthorized sanitary sewer discharges and, as a result, an increased level of interest from regulators. To develop a sustainable Public Works infrastructure, the City has decided to proactively implement an asset management solution and perform condition assessments to reduce unauthorized sanitary sewer discharges, maintain all of water, sewer and stormwater systems and promote resilience. The City's first step towards this asset management solution involves the implementation of an enterprise asset management (EAM) system.

Black & Veatch provides the City of Fort Lauderdale with an engineeringled team that has proven EAM system integration experience, asset management and condition assessment expertise to help the City protect its assets and ensure compliance with regulations. The Black & Veatch Team is comprised of national and small business partners, including CH2m, Radise International and Tobon Engineering, with collective knowledge of the City's water, sewer and stormwater systems and over 170 years of experience providing infrastructure solutions to utilities in Florida. The City will receive from Black & Veatch a GIS-centric, condition assessmentdriven EAM system tailored to the maintenance needs of the City's water, sewer and stormwater infrastructure that will help the City achieve its asset management goals in support of sustainability and resilience.

The City will receive the following benefits from our approach to the implementation of the EAM system:

- Improvement on the performance and efficiency of City Departments from a GIS-centric EAM system that will fully leverage the City's GIS.
- Cost-effective implementation and time savings ensured by seamless integration with current City technologies, including ERP Infor/Lawson, Cayenta, Laserfiche and Q-Alert.
- Optimized operations of its water, sewer and stormwater systems through an implementation that will maximize data integration between the proposed EAM system and the City's InfoWater and ICPR4 models.
- Proper documentation of condition assessments of water, sewer and stormwater systems and integration of the collected data.
- Assurance of successful EAM implementation through the leadership of a proven Project Manager, Mark Seastead, with extensive experience implementing comprehensive EAM solutions, and expertise in GIS and asset management.

Our EAM implementation approach centers on protecting the City's assets and delivering an EAM system that will allow the City to complete future important asset management tasks for proactive, reliability-centered maintenance, including:

- Identification of critical assets to maintaining service.
- Development of remaining useful life estimates.
- Performance of risk-based prioritization and scheduling of repairs.
- Performance of system-wide capacity evaluations.

We are ready to implement a GIS-centric EAM system that will support the City's asset management goals. We welcome the opportunity to discuss the details of our proposal and invite you to contact me with any questions at (954) 465-6872. Thank you for your consideration; we look forward to partnering with the City of Fort Lauderdale on this important project.

Very truly yours,

BLACK & VEATCH

Brent Reuss, PE Vice President

Rafael E. Frias III, PE Project Director

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Executive Summary

The public works infrastructure of the City of Fort Lauderdale (City) has been in operation for more than a century. Now deteriorating, it is in need of rehabilitation and replacement (R&R). Recently, the City's aging sewer infrastructure has allowed unauthorized sanitary sewer discharges, which has contributed to an increased level of interest from regulators. In addition, there is a need to have a stormwater drainage system with sufficient capacity to manage the impacts of sea-level rise and prevent flooding. To develop a sustainable public works infrastructure, the City has decided to proactively implement an asset management solution to prioritize the needs and promote the resilience of its public works infrastructure. The City's first step for this asset management solution involves the implementation of an enterprise asset management (EAM) system. Black & Veatch's Information Solutions Group have more than 50 EAM implementations and we understand the value of GIS. Our GIS centric solution will provide the City with the leading GIS based EAMS backed by Black & Veatch's unmatched expertise in public infrastructure

management.

ABOUT BLACK & VEATCH

Black & Veatch Corporation will perform this work out of our local Broward County office. We are a leading global engineering, consulting and construction company with the mission of Building a World of Difference. Advancing the frontiers of knowledge, we provide our clients with reliable

solutions to their most complex challenges, helping them improve and sustain the quality of life around the world. Founded in 1915, our employee-owned company now has more than 100 offices worldwide. Black & Vactor is replace on

more than 100 offices worldwide. Black & Veatch is ranked on the Forbes "500 Largest Private Companies in the United States" listing.

Black & Veatch has been serving clients in Florida for over 55 years. We provide complete engineering services from our offices in Coral Springs, Miami, Lake Worth, Fort Myers, Tampa, Orlando and Jacksonville. More

than 340 of our professionals are located in Florida, including 95-plus registered professional engineers. These engineers are backed by Black & Veatch's global resources.

ONE COMPANY, COMPREHENSIVE EXPERTISE

Our services are in a wide range of disciplines

- Civil
- Structural
- Water
- Wastewater
- Reclaimed Water

- Geotechnical
- Environmental
- Electrical
- Mechanical Engineering
- Construction

- Operations
- Science
- Economics
- Planning
- Finance

The City of Fort Lauderdale will receive a **GIS-centric, condition assessment-driven EAM system** tailored to the maintenance needs of the City's water, sewer and stormwater infrastructure that will help the City achieve its asset management goals in support of sustainability and resilience.

Black & Veatch will be the business entity performing this work from our local office in Broward County:

2855 North University Dr., Ste. 210 Coral Springs, FL 33065

Rafael E. Frias III, P.E. <u>FriasRE@bv.com</u> 754-229-3049 Black & Veatch provides the City with an **engineering-led team** with **proven EAM system integration experience**, **asset management and condition assessment expertise** to help the City protect its assets and ensure compliance with regulations.

Black & Veatch's experience of over 100 years in the Energy and Water industries provides the City with deep asset management expertise developed from our leadership in the Energy industry and technical understanding of the electric, water, oil and gas infrastructure.

THE BLACK & VEATCH TEAM

The Black & Veatch Team includes CH2M, RADISE International and Tobon Engineering. They bring industry leading practices, unparalleled asset management and condition assessment expertise, plus local knowledge of the City's systems. Our Team brings the City over 170 years of experience combined, providing infrastructure solutions to water, wastewater and stormwater utilities in Florida.

The Black & Veatch Team provides a Project Manager with proven experience implementing comprehensive EAM solutions, and expertise in GIS and Asset Management to best support the City's asset management goals.

Our Team includes a *Project Manager, Mark Seastead,* who has proven experience implementing comprehensive EAM solutions, and expertise in GIS and Asset Management to best support the City's asset management goals. *Our Team's EAM experience and GIS expertise will provide the City with assurance of successful EAM system implementation that will result in improvements on performance and efficiency to City departments by fully leveraging our condition assessment and asset management capabilities.*

Our team can deliver complete EAM system implementation support. We bring hands-on end-user and implementation experience in numerous EAM solutions, including *Cityworks, Accela, Cartegraph, Infor, Lucity, Maximo and SAP EAM.* This experience, coupled with our proposed Cityworks solution, allows us to provide the City with best industry practices for its EAM system needs. Key members of our team include:



EAM SYSTEMS QUALIFICATIONS AND TECHNICAL EXPERTISE

Black & Veatch is a Silver-level Cityworks Implementation Business Partner. Our key implementation staff has more than 10 years of experience implementing Cityworks for utilities. We have a level of practical expertise that has been developed from successfully completing more than 50 Computerized Maintenance Management System CMMS/EAM implementations for utilities in a wide range of sizes and services, including water, wastewater, stormwater, transportation and roads, city facilities, fleet, harbors, solid waste, parks and recreation, sustainability, engineering services, materials management, and more. *The following table provides a list of vendor systems that is representative of our EAM systems implementation experience.* Black & Veatch is a <u>Silver-</u> <u>level Implementation</u> <u>Business Partner of</u> <u>Cityworks</u>. Our key implementation staff has more than 10 years of experience and over 50 Cityworks implementations for utilities.

ORGANIZATION	CARTEGRAPH	cityworks	INFOR EAM	INFOR PUBLIC SECTOR	LUCITY	ΜΑΧΙΜΟ
Miami-Dade Water & Sewer Department; FL						
Trinity River Authority; TX						
City of Olathe, Department of Public Works; KS						
City of Charlotte – Water, Transportation, Transit & Solid Waste Depts.; NC						
Des Moines Water Works; IA						
City of Indianapolis / Marion County; IN						
Utilities, Inc.; AL, FL, GA, IL, NV						
City of Escondido; CA						
City of Winston-Salem; NC						
City of Overland Park; KS						
Nashville Metropolitan Water Services; TN						
Hampton Roads Sanitation District; VA						
Board of Public Utilities of Kansas City; KS						
City of Greenville; SC						
Jackson Energy Authority, TN						
Salt Lake City, UT						
City of Mesa, Signal Butte Water Treatment Plant; AZ						
Tulsa Metropolitan Utility Authority; OK						
City of Memphis; TN						
City of Topeka; KS						
City of Highland Village; TX						
County of Spotsylvania; VA						
City of Rock Hill; SC						

Representative Sample of Black & Veatch's EAM Systems Implementation Experience

CAM #18-0085 Exhibit 3 8 of 173 Our Team has proven expertise integrating Cityworks with Cayenta and other existing City technologies, which will promote a cost-effective and expedited implementation through seamless integration with current technologies.

APPROACH TO SCOPE OF WORK

The City requires the implementation of an EAM system that is scalable and integrates well with its current technologies, including ERP Infor/Lawson, Cayenta, Laserfiche and Q-Alert. *Our Team's recommended solution involves the implementation of Cityworks, which is a GIS-driven EAM system that provides an open architecture to help streamline integration.* Our Team has the proven expertise integrating Cityworks with Cayenta and other existing City technologies to provide cost-effective and expedited implementation through seamless integration with current technologies. *The following table provides a brief summary of key RFP requirements compared against several of the EAMS/CMMS solutions that the City may have been considering.*

General RFP Requirements	Cayenta / Geonexus	Accela	Cityworks	Lucity	NexGen	Utility Cloud
EAM System						
Preventive and Planned Maintenance Scheduling (to assist with CIP Planning)						•
Work Management (e.g. WO Generation, Work Planning Tools)						
Work Order Billing						
Service/Customer Relationship Management, including Customer Portal (issue or incident logging)						
Comprehensive Audit Trail and Reporting Capability						
Budget Model to Assist with Funding Requests						
Parts/Supplies Inventory						
Asset Management						
Asset Record Tracking						
Asset Accounting (Budgeting, Depreciation and forecasting.						
Condition Assessment						
Risk/Financial Analysis			2	2		
Asset Lifecycle Management			2 ²	2		
Human Capital Management						
Field Inventory and Data Collection						
Dynamic Master Planning Capacity			2	2		
Capital Planning Functionality			2	2		
Planning and Reporting (CMOM)						
Technical Requirements						
ESRI GIS Integration						
GIS Mapping						
Interface Flexibility/Customization						
Open Platform API and SDK						
Comprehensive and Granular Security						
Local Hosting & Cloud Hosting Capability						
Single GIS & Asset Database						
Easily Streamlined User Interface						
Other						
Fleet Maintenance and Management of Vehicles						

Requirement is met. 2 – Requires 3rd party assistance.

Our evaluation shows that Cityworks meets the greatest number of requirements. Based on the City's requirements and our Team's EAM system experience, we recommend *Cityworks* as the EAM system solution for implementation. *It will allow the City to leverage its investment in GIS and continue its enterprise GIS-centric data sharing approach.*

Cityworks offers the greatest functional capabilities, integration with GIS, and the ability to meet the City's long-term asset management goals for business process mapping, data, systems and people.

EAM SYSTEM IMPLEMENTATION APPROACH

The City has the opportunity to leverage data from its GIS, water, sewer and stormwater models into the EAM system. *The Black & Veatch Team processes the technical capabilities, including expertise in InfoWater, ICPR4 and SWMM, to maximize data integration between the selected EAM system and the City's models, and optimize the City's assets through reliability-centered maintenance.*

Our implementation approach focuses on the premise that "business should drive technology" – not the opposite. It will define the City's specific functional and technical requirements associated with the successful implementation of an EAM system, in support of the City's business practices and processes. Two phases make up our approach:

- Phase 1. Implementation and Integration of the Water, Sewer and Stormwater Systems (per answer 38 of Q&A document).
- Phase 2. Implementation and Integration of the Water and Wastewater Treatment Facilities (to be performed as a future phase per answer 38 of Q&A document).

Black & Veatch will also coordinate with Streamline Technologies, the developer of ICPR4 (the City's stormwater management model), and Innovyze, the developer of InfoWater (the City's water and sewer model), to allow for data transfer between the models and Cityworks. In addition, Assetic will be used to integrate Assetic Predictor with Cityworks and ESRI for advanced asset management analysis. The coordination with the City's current stormwater and water/sewer models, together with the implementation of Assetic, will enable the City to have increased access to available data, enhancing its asset management capabilities.

Our two-phase approach will allow for efficient implementation of the EAS system with minimal disruptions to City staff and its operations.

Assetic will be used to integrate Assetic Predictor with Cityworks and ESRI for advanced asset management analysis.

IMPLEMENTATION SCHEDULE

The proposed implementation schedule has an estimated duration of three years for Phases 1 and 2. The estimated duration of Phase 1 is 15 months. We believe this is a reasonable timeline; however, Black & Veatch will be open to shifting priorities to accommodate the City's changing needs.

One of our primary goals is to balance the City's short-term need to implement a proven EAM system with the long-term goal of providing a sustainable solution that benefits the City across all departments.

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EAMS Existing systems analysis	0	0																															
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Phase 2 – Water & Sewer Treatment Facilities																																	
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Configuration plan					_									C		0 0	D																
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Form 1 – General Supplier Information

Proposer and Software Information	
1. Contact Information	
a. Company Name	Black & Veatch Corporation
b. Name and Title of Contact Person	Rafael Frias, Project Director
c. Company Address	2855 North University Dr. Ste. 210 Coral Springs, FL 33065
d. Telephone	(954) 465-6872
e. Email Address	FriasRE@bv.com
f. Company Website	www.bv.com
2. Regional Offices and Staff	
a. Describe whether your organization is local, regional, national or international.	Global organization with national, regional, and local offices, including seven offices in Florida.
b. Regional office servicing this engagement	The responsible office of Black & Veatch for this project is our Regional Office, located in Coral Springs, FL.
c. Describe the range of services provided by the office servicing the engagement and # of employees.	We have ten professionals in our Coral Springs, which will be the officer servicing this project for the City of Fort Lauderdale.
	The range of services provided by our office includes a wide-range of disciplines, such as: conceptual and preliminary engineering services, engineering design, procurement, construction, asset management, environmental, security design and consulting, and management consulting. In addition, our office provides comprehensive EAM system services that include: EAMS system assessment EAMS systems selection Business process mapping Asset database design

	 Asset data inventory and condition assessment EAMS Configuration EAMS Integration EAMS system acceptance testing EAMS training and user support EAMS custom solutions For additional specific information please refer to the Experience and Qualifications tab of our proposal.
3. Company Information	
a. Briefly describe your company and the characteristics that set your company apart in terms of service, methodology, approach, and software, etc.	Black & Veatch is a leading global engineering, consulting and construction company with the mission of Building a World of Difference®. By advancing the frontiers of knowledge, we provide our clients with reliable solutions to their most complex challenges, thereby helping improve and sustain the quality of life around the world.
	Black & Veatch will provide the City of Fort Lauderdale with a GIS- centric, asset management-driven EAM system that will be tailored to the City's maintenance needs for its water, sewer and stormwater infrastructure to help the City achieve its asset management goals in support of sustainability and resilience.
	The integration of the EAM system will be delivered by an experienced team, led by a Project Manager with proven EAM system integration experience on projects for municipalities similar in size and complexity to the City. Our proven experience provides the City with assurance of successful EAM system implementation that will result in improvements on performance and efficiency to its Departments by fully leveraging

		the City's GIS.
		Black & Veatch's philosophy on EAMS software is that the City's business need should drive technology. The City of Fort Lauderdale should not be limited only to out of the box functionality; instead, through careful configuration and detailed understanding of the City's business processes, the EAM system will be able configured and tailored to the City's business requirements to realize improvements on performance and efficiency.
		For additional specific information on our differentiators and methodology, please refer to the Experience and Qualifications tab of our proposal.
b.	Briefly describe how you will meet our requirements and maximize our return on investment.	The City of Fort Lauderdale requires the implementation of a GIS-centric EAM system. The Black & Veatch Team provides the City with a Project Manager with proven experience implementing comprehensive EAM solutions, and expertise in GIS and Asset Management. Our EAM experience and GIS and asset management expertise will provide the City with assurance of successful EAM system implementation that will result in improvements on performance and efficiency to City Departments by fully leveraging GIS. The City also requires the implementation of an EAM system that is scalable and integrates well with its current technologies.
		with its current technologies, including ERP Infor/Lawson, Cayenta, Laserfiche and Q-Alert. The Black & Veatch Team's recommended solution involves the implementation of Cityworks, which is a GIS-driven EAM system

that can be expanded to all City Departments. Our Team has proven experience integrating Cityworks with Cayenta and other existing City technologies, which will provide the City with a cost- effective and expedited implementation through seamless integration with current technologies.
In addition, the City has a need to leverage data from its GIS, water, sewer and stormwater models into the EAM system. The Black & Veatch Team provides the City with a Project Manager with proven experience in GIS and EAM systems, as well as Technical

		 with a Project Manager with proven experience in GIS and EAM systems, as well as Technical Resources with expertise in InfoWater and ICPR4. Our expertise with these two models will provide the City with the opportunity to maximize data integration between the EAM system and its InfoWater and ICPR4 models to optimize its assets through reliability- centered maintenance. In summary, the Black & Veatch Team has collective knowledge of the City's water, sewer and stormwater systems. Our knowledge will provide the City of Fort Lauderdale with an efficient and time-savings implementation of its EAM system. For additional specific information on how we will maximize the City's return on investment, please refer to the Approach to Scope of Work
		tab of our proposal.
C.	Year Founded	1915
d.	Private vs. Public (Listing Exchange and Listing Code)	Private (employee owned)

e.	Fiscal Year End	December
f.	Revenue: Current Year	\$3.20 billion
g.	Revenue: Prior Year	\$2.95 billion
h.	Net Income/Loss: Current Year	\$75 million
i.	Net Income/Loss: Prior Year	\$109 million
j.	% of gross revenue generated by proposed software & related maintenance and services.	2.5% - as part of our Planning and Asset Management Practice
k.	Parent Company (If separate)	Black & Veatch Holdings
l.	Describe parent company's relationship with the proposing party.	Black & Veatch Corporation is a subsidiary of Black & Veatch Holdings, which is incorporated in Delaware
m.	Mergers and Acquisitions (Changing business, name changes, acquisitions/mergers, etc.)	The company name has never changed and no mergers or acquisitions are attributed to the formation of Black & Veatch.
n.	Describe if your organization is international, national, regional or local. Please explain.	Black & Veatch is a global company with over 100 offices world-wide and seven offices in Florida, including an office in Broward County.
0.	Describe how the company has grown. Organically or thru acquisition, thru mergers, etc.?	Black & Veatch was officially started as a two-person partnership in 1915, but its roots began developing years earlier when Mr. Ernest Bateman Black met Mr. Nathan Thomas Veatch at the University of Kansas. Mr. Black later teamed with Mr. J.S. Worley and formed Worley & Black in 1912. When Mr. Worley left to pursue a government contract, Mr. Black remembered his former colleague and offered Mr. N.T. Veatch a partnership. Thus, Black & Veatch was formed. Black & Veatch grew organically during its first 60-plus years and expanded dramatically between 1977 and 1984, opening 11 regional offices. After a series of acquisitions plus continuing organic growth, the company had 35 offices in the United States by

	1990 and was also expanding globally with six offices outside the U.S.
	In 1999, the company changed its structure from the general partnership begun in 1956 to an employee-owned corporation. That change facilitated the company's growth, as many of its clients were involved in multiple markets across the core sectors of water, energy, information and government.
	Today, the company continues to experience strong growth across its core markets with an annual revenue exceeding \$3.2 billion.
p. Are there any planned acquisitions or mergers in the future?	No. Black & Veatch enjoys the benefit of being a 100% employee-owned company.
 q. Disclose any recent litigation (and outcomes) and litigation currently underway. A. Staff (List Staff and Sub Consultants Surrents). 	Black & Veatch Corporation, together with its affiliates ("Black & Veatch"), constitutes a large, international engineering and construction firm. Like similarly- sized firms, at any given point in time, we may be involved with claims and litigation. Black & Veatch maintains a program of insurance to protect against claims arising out of its work. In the opinion of Black & Veatch management, no pending claim or litigation will have a material impact on Black & Veatch's ability to execute this project for the City of Fort Lauderdale.
4. Staff (List Staff and Sub-Consultants Separately) Employees	
a. Total Worldwide	10,459
b. Total in U.S.	6,940
c. Staff dedicated to the proposed software	10 – We will augment our staff in collaboration with our teaming partners.
d. U.S. staff dedicated to the proposed software	10 – We will augment our staff in collaboration with our teaming

	partners.
 e. Full-time employees in: Implementation and training Customer service Technical/Development Administrative Other (note relevant staff): 	See attached
5. Number of Customers Using the Proposed Software	Black & Veatch customers / Cityworks Customers
a. Total Worldwide	5 Black & Veatch / 600+ customer sites worldwide for all of Cityworks
b. Total in U.S.	5 Black & Veatch / 500+ US customer sites for all of Cityworks
c. Florida Cities using the proposed software	13 cities, plus 14 others (counties, utilities, etc.)
d. Other cities using the proposed version	5 Black & Veatch / 500+ US customer sites for all of Cityworks
6. List your City customers with similar requirements installed with your proposed solution	Charlotte, NC (Solid Waste, CDOT, CATS), Jackson Energy Authority, TN, Escondido, CA, Rock Hill, SC, Salt Lake City, UT
7. Supplier's Implementation Model – Direct, VAR, Implementation Partner, etc.	Black & Veatch is an Authorized Implementation and Silver Business Partner with Cityworks.
8. Version Schedule	
a. Current version and general availability release date	Cityworks 15.1—Platform 4.1, released July 2016
b. Proposed version & general availability release date	Cityworks 15.1—Platform 4.1, released July 2016
c. Estimated release date for next version	Cityworks 15.2, planned release Q3 2017
d. Typical release schedule & time to install	Major versions are released approximately yearly. Service packs are released every few months for approximately two years. Install and configuration time can vary depending on project complexity.
e. Number of prior versions supported	Azteca Systems fully supports the current major version and the previous major version of software with service pack updates. For

	example, if 15.1—Platform 4.1 is the current version, then full support and service pack updates are provided for Cityworks 2015— Platform 4 (the previous version) as well as 15.1—Platform 4.1. Beyond two versions, Azteca Systems will no longer release software service packs for that product except for data corruption issues.
 9. User protection plans Briefly describe what user protection plans you have. For example: a. Source code held in Escrow b. No charge to migrate to similar new software (e.g. new technology c. Other options 	Azteca Systems does not offer escrow. The Cityworks software licensing fee is designed as a value- based model (or maintenance fee model). Value-based models are characterized by a shift from large upfront payments to periodic maintenance fees. The Cityworks value-based model allows licensed organizations to have access to the Cityworks software and receive updates and support for an annual maintenance fee.
10. We require having development, back-up, training, testing and archival copies of the software in addition to the production copy. Is this provided as standard with your Software? If there is a cost, please list in your proposal	Provided standard with software.
 11. Briefly describe your customer service and support. a. What options and the cost b. What is covered and what isn't c. Customer support hours d. When do the software maintenance agreement goes into effect? 	 See Addendum #2 of Cityworks License And Maintenance Agreement– Standard Maintenance and Support from Cityworks. a. Cost – included as part of licensing fee. b. What is covered –Cityworks provides maintenance and support services as part of the licensing cost of its products. Support is provided as long as the licensee continues to pay for the license. Support includes technical support, new version software, service packs, software upgrades, and software updates. c. Customer support hours – Telephone, email, web support, during normal

business hours 8 AM to 5 PM Mountain time, Monday through Friday (except holidays) and after hour emergency support line.

- d. When does software maintenance agreement go into effect? – coverage begins as soon as licensing fees are paid.
- e. What is not covered: Support for applying or installing upgrades and service packs; Assistance with questions related to third party software, computer hardware. networking, and other similar items that are not provided by Azteca. Note that Black & Veatch will provide additional support as requested and approved by the City of Fort Lauderdale to aid in resolution of these matters; Assistance with computer operating system questions not directly pertinent to the covered software or program modifications; licensee data debugging and/or correcting; Services necessitated as a result of any cause other than authorized ordinary and proper use by the Licensee of the covered software, including but not limited to neglect, abuse, unauthorized modifications and/or unauthorized updates; consulting regarding customizations created to function with the covered software unless the customization is identified and listed as covered software in addendum 1 (none); Assistance with applications which are not part of a standard life cycle,

	such as preview, beta, or candidate releases; and questions such as configuration, implementation and walk- throughs. Note that Black & Veatch will provide additional support as requested and approved by the City to aid in resolution of these matters.
 12. Briefly describe your training: Approach and philosophy Options (Learning center, interactive Web courses, CD/DVD, onsite, train-the-trainer, etc.) Prices/rates 	Black & Veatch believes that effective training is required for the success of any implementation. The following is a description of our common training; however, we customize training to accommodate client's preferences but we always use client data and business processes as part of our training. Because our training is customized to our client's needs we do not offer standard prices for a training class. Our pricing is dependent upon understanding client business processes, training goals, and required volume and type of training materials required. Types of training includes: Core Team Training Typically occurs at the beginning of each phase, and each session will last approximately one day. This training will allow the core team for each division the ability to gather an understanding of the functionality of the Cityworks system. Topics include, service requests, work orders, GIS, assets, inspections, Inboxes, searching, and storeroom. Standard non- customized training documentation will be used for core team training. Cityworks administrator Training Cityworks administration training will be provided for designated technical staff that will be rasponsible for the daily.

administration of the system. This training will occur at the beginning of the project, and again at the end of the project to ensure that administrators are able to maintain the system. Training that occurs at the end of the implementation will cover additional, more advanced topics. Administrator training will take approximately 3-4 days per session. Non-customized training materials will be used for beginning of project training, and the final administrator training will mostly cover information included in the completed **Cityworks Configuration Plan. Report Writing Training** This training will cover the basics of creating a report for information coming out of the Cityworks system using the selected reporting tool. The goal of this training is to provide report writers knowledge of the Cityworks database structure and where information is stored within the database. Report writers will also learn how many of the Cityworks tables are linked to each other. Attendees of this class should have basic knowledge of report writing and familiarity with SQL Server databases. This training class with take two days, and customized training documentation will be provided. Train the Trainer – End-**User Training:** End-User training will be conduction by either client power users from each division. The train-the-trainer approach requires the power users/trainers

to be involved during every aspect of the project to have a thorough understanding for why and how

the system is configured. This allows power users/trainers to affectively answer questions as they come up during training. To

	support the end-user training, Black & Veatch will create a Training Plan that will describe the training sessions, topics covered, user roles to be trained in each session, class sizes, and class locations. Classes will be grouped by topic (work orders, service requests, etc.) and type of user (supervisor, field crew, etc.). Additionally, Black & Veatch creates custom training materials for each of the sessions defined in the training plan. These customized training materials will be tailored to City of Ft. Lauderdale business processes data and
	Cityworks configuration. This training will occur at the end of each phase and each end-user will attend approximately two days of training, dependent on topics covered. Black and Veatch will also provide training support and backup for the City trainer.
	Cityworks also provides continuing training, information can be found at <u>www.mycityworks.com</u> .
	For additional information please refer to the Experience and Qualifications tab of our proposal.
13. Company Qualifications	
a. Three or more years of related EAM system experience. Briefly describe.	Yes. Black & Veatch has been an authorized implementation and Silver Business Partner with Cityworks for more than 5 years. Additionally, our staff has over 10 years of Cityworks implementation experience. In addition, Black & Veatch staff is experienced with the implementation of a complete suite of EAM systems to provide our clients with the EAM system solution that best fits their asset management goals.
b. Experience working with cities of our size. Briefly	Black & Veatch has proven

describe.	experience working with Cities of similar size to the City of Fort Lauderdale. Examples include: Charlotte, NC (pop. 850,000), Escondido, CA (pop. 150,000), Tulsa, OK (pop. 400,000), Rock Hill, SC (pop. 70,000) and Greenville, SC (pop. 65,000).
c. Briefly describe your experience integrating with ESRI GIS.	Black & Veatch is an ESRI business partner. We have a staff of over 50 GIS professionals and our core Cityworks implementation team has in depth expertise with geodatabase design, ArcGIS Server, ArcGIS implementation and installation. Our staff has built a number of customized tools on the ESRI toolset, including our iCIP tool, to aid municipalities with capital planning for asset management.
Contract and Agreements	
 14. Contract Termination for Default Please list all incidents in the past 5 years in which you have had a contract terminated for default. Termination for default is defined as notice to stop performance due to your non- performance or poor performance; and the issue was either (a) not litigated or (b) litigated, and such litigation determined you to be in default. Please provide: a. Full details of all terminations for default b. The other party's name, address and telephone c. Your position on the matter 	None
 15. Contract termination before contract completion for convenience, non-performance, non-allocation of funds, etc. Please list all incidents in the past 5 years in which you have had a contract terminated before completion (e.g. for convenience non-performance, non-allocation of funds or any other reason) Please provide: a. Full details of all such terminations b. The other party's name, address and telephone c. Your position on the matter 	Black & Veatch Corporation, together with its affiliates ("Black & Veatch"), constitutes a large, international engineering and construction firm. Like similarly- sized firms, from time to time, we may be involved in projects that are suspended, cancelled or otherwise terminated by our clients for their convenience or for other reasons unrelated to Black & Veatch's performance. In the opinion of Black & Veatch management, no such instances would have a material impact on Black & Veatch's ability to execute this project.

16. Capacity and Capability Give an exact schedule of the projects that are	Project	Pending Start	Estimated Completion
anticipating, pending, in progress and nearing completion	JEA - Cityworks Phase 2 (Treatment Plants)	8/1/2017	9/30/2018
start dates, near completion and that I anticipate with the next 5 months to three (3) years.	Mesa, AZ - Cityworks WWTP Plant	6/15/201 7	12/30/201 7
	CDOT - Cityworks Implementation	Ongoing	12/30/201 8
	Charlotte Solid Waste - Cityworks Support	6/1/2017	5/30/2018
	Port of San Diego - EAMS Support	Ongoing	12/30/201 7
	Salt Lake City - Cityworks WWTP Plant	Ongoing	12/30/201 7
	Greenville, SC - Cityworks Training	Ongoing	6/30/2017
	Rock Hill, SC - Citizen Engagement		10/30/201
	Portal San Diego County - Cityworks	7/1/2017	7
	Implementation Gwinnett County, GA - Maximo	7/1/2017	6/30/2018
	Support HRSD - AM Program/	6/1/2017	10/1/2017
	Support	Ongoing	9/30/2017

Proposed Implementation Partner/System Integrator/Project Manager/VAR Information	
1. Contact Information	
a. Company Name	Black & Veatch Corporation
b. Name and Title of Contact Person	Rafael Frias, Project Director Mark Seastead, Project Manager
c. Company Address	2855 North University Dr. Ste. 210 Coral Springs, FL 33065
d. Telephone	(954) 465-6872
e. Email Address	FriasRE@bv.com SeasteadMT@bv.com
f. Company Website	www.bv.com
2. Regional Offices and Staff	

	a. Describe whether your organization is local, regional, national or international.	Global organization with national, regional, and local offices, including seven offices in Florida.
	b. Regional office performing this engagement.	The responsible office of Black & Veatch for this project is our Regional Office, located in Coral Springs, FL.
c. Describe the range of services provided by the office performing the engagement and # of employees.		 We have ten professionals in our Coral Springs, which will be the officer servicing this project for the City of Fort Lauderdale. The range of services provided by our office includes a wide-range of disciplines, such as: conceptual and preliminary engineering services, engineering design, procurement, construction, asset management, environmental, security design and consulting, and management consulting. In addition, our office provides comprehensive EAM system services that include: EAMS system assessment EAMS systems selection Business process mapping Asset database design Asset data inventory and condition assessment EAMS Configuration EAMS Integration EAMS training and user support EAMS custom solutions For additional specific information please refer to the Experience and Qualifications tab of our proposal.
3.	Company Information	
	a. Briefly describe your company and the characteristics that set your company apart.	 Black & Veatch is a leading global engineering, consulting and construction company with the mission of Building a World of Difference®. By advancing the frontiers of knowledge, we provide our clients with reliable solutions to their most complex challenges, thereby helping improve and

	sustain the quality of life around the world.
	Black & Veatch will provide the City of Fort Lauderdale with a GIS- centric, asset management-driven EAM system that will be tailored to the City's maintenance needs for its water, sewer and stormwater infrastructure to help the City achieve its asset management goals in support of sustainability and resilience.
	The integration of the EAM system will be delivered by an experienced team, led by a Project Manager with proven EAM system integration experience on projects for municipalities similar in size and complexity to the City. Our proven experience provides the City with assurance of successful EAM system implementation that will result in improvements on performance and efficiency to its Departments by fully leveraging the City's GIS.
	Black & Veatch's philosophy on EAMS software is that the City's business need should drive technology. The City of Fort Lauderdale should not be limited only to out of the box functionality; instead, through careful configuration and detailed understanding of the City's business processes, the EAM system will be able configured and tailored to the City's business requirements to realize improvements on performance and efficiency.
	For additional specific information on our differentiators and methodology, please refer to the Experience and Qualifications tab of our proposal.
b. How many years of experience do you have	Black & Veatch has been an authorized implementation and

implementing the proposed software?	Silver Business Partner with Cityworks for more than five years. Additionally, our staff has over 10 years of Cityworks implementation experience.
c. Briefly describe how you will meet our requirements and maximize our return on investment.	The City of Fort Lauderdale requires the implementation of a GIS-centric EAM system. The Black & Veatch Team provides the City with a Project Manager with proven experience implementing comprehensive EAM solutions, and expertise in GIS and Asset Management. Our EAM experience and GIS and asset management expertise will provide the City with assurance of successful EAM system implementation that
	proven experience in GIS and EAM

		systems, as well as Technical Resources with expertise in InfoWater and ICPR4. Our expertise with these two models will provide the City with the opportunity to maximize data integration between the EAM system and its InfoWater and ICPR4 models to optimize its assets through reliability- centered maintenance.
		Team has collective knowledge of the City's water, sewer and stormwater systems. Our knowledge will provide the City of Fort Lauderdale with an efficient and time-savings implementation of its EAM system. For additional specific information on how we will maximize the City's return on investment, please refer to the Approach to Scope of Work
d Voor Foundad		tab of our proposal.
d. Year Founded		
e. Private vs. Public (Code)	Listing Exchange and Listing	Private (employee owned)
f. Fiscal year end		December
g. Revenue: Current	Year	\$3.20 billion
h. Revenue: Prior Ye	ar	\$2.95 billion
i. Net Income/Loss:	Current Year	\$75 million
j. Net Income/Loss:	Prior Year	\$109 million
k. % of gross revenue software & related	e generated by proposed I maintenance and services.	2.5% - as part of our Planning and Asset Management Practice
l. Parent Company (lf separate)	Black & Veatch Holdings
m. Describe parent co proposing party.	ompany's relationship with the	Black & Veatch Corporation is a subsidiary of Black & Veatch Holdings, which is incorporated in Delaware
n. Genealogy of Orga	nization (Changing business,	The company name has never

	name changes, acquisitions/mergers, etc.)	changed and no mergers or acquisitions are attributed to the formation of Black & Veatch.
0.	Describe if your organization is international, national, regional or local. Please explain.	Black & Veatch is a global company with over 100 offices world-wide and seven offices in Florida, including an office in Broward County.
p.	Describe how the company has grown. "Organically," thru acquisition, thru mergers, etc.?	 Black & Veatch was officially started as a two-person partnership in 1915, but its roots began developing years earlier when Mr. Ernest Bateman Black met Mr. Nathan Thomas Veatch at the University of Kansas. Mr. Black later teamed with Mr. J.S. Worley and formed Worley & Black in 1912. When Mr. Worley left to pursue a government contract, Mr. Black remembered his former colleague and offered Mr. N.T. Veatch a partnership. Thus, Black & Veatch was formed. Black & Veatch grew organically during its first 60-plus years and expanded dramatically between 1977 and 1984, opening 11 regional offices. After a series of acquisitions plus continuing organic growth, the company had 35 offices in the United States by 1990 and was also expanding globally with six offices outside the U.S. In 1999, the company changed its structure from the general partnership begun in 1956 to an employee-owned corporation. That change facilitated the company's growth, as many of its clients were involved in multiple markets across the core sectors of water, energy, information and government.
		experience strong growth across its core markets with an annual revenue exceeding \$3.2 billion.

	q.	Are there any planned acquisitions or mergers in the future?	No. Black & Veatch enjoys the benefit of being a 100% employee-owned company.
	r.	Disclose any recent litigation (and outcomes) and litigation currently underway.	Black & Veatch Corporation, together with its affiliates ("Black & Veatch"), constitutes a large, international engineering and construction firm. Like similarly- sized firms, at any given point in time, we may be involved with claims and litigation. Black & Veatch maintains a program of insurance to protect against claims arising out of its work. In the opinion of Black & Veatch management, no pending claim or litigation will have a material impact on Black & Veatch's ability to execute this project for the City of Fort Lauderdale.
4.	# (of Employees	
	a.	Total Worldwide	10,459
	b.	Total in U.S.	6,940
	c.	# dedicated to the proposed software	10 – We will augment our staff in collaboration with our teaming partners.
	d.	U.S. # dedicated to the proposed software	10 – We will augment our staff in collaboration with our teaming partners.
5.	Nu	mber of Customers Using the Proposed Software	Black & Veatch customers only
	NC	TE: These are the customers that you implemented	
	a.	Total Worldwide	5 Black & Veatch / 600+ customer sites worldwide for all of Cityworks
	b.	Total in U.S.	5 Black & Veatch / 500+ US customer sites for all of Cityworks
	c.	# cities using the proposed software	5 Black & Veatch / 600+ customer sites worldwide for all of Cityworks
	d.	# cities using the proposed version	N/A
	e.	The number of Cities in the USA using the proposed software	500+ US customer sites for all of Cityworks
6.	Lis	st your City customers with similar requirements	Charlotte, NC (Solid Waste, CDOT, CATS), Jackson Energy Authority,

installed with the proposed solution. Note: These are the customers that you implemented.	TN, Escondido, CA, Rock Hill, SC, Salt Lake City, UT.
7. Target User Profile for This Software Where size are the majority of your customers using the proposed software are)? E.g. Number of citizens and operating budget.	Any size municipality.
8. Software Supplier Relationship and Implementation Model Briefly describe your relationship with the software supplier, formal software training, development work, etc.	Black & Veatch is an authorized implementation and Silver Business Partner with Cityworks. Black & Veatch is allowed to implement, train, support, and develop on the Cityworks platform.
9. Have you developed any add-on products to the proposed software? If so, please explain.	Yes. Black & Veatch PlantWorks is an add-on that is proposed for use at Treatment facilities. This user friendly tool allows facilities staff to rapidly access asset hierarchies (non-spatial) quickly and visually through a dynamic asset hierarchy. The application is seamlessly integrated with Cityworks and supported annually through professional services.
 10. Briefly describe your customer service and support. a. What options are available and what is the cost b. What is covered and what isn't 	 See Addendum #2 of Cityworks License And Maintenance Agreement- Standard Maintenance and Support from Cityworks. a. Cost - included as part of licensing fee. b. What is covered - Cityworks provides maintenance and support services as part of the licensing cost of its provided as long as the licensee continues to pay for the license. Support includes technical support, new version software, service packs, software upgrades, and software
 11. Briefly describe your training: a. Does the Software Supplier provide training or are you responsible for training? b. Approach and philosophy c. Options (Learning center, interactive Web courses, 	Black & Veatch believes that effective training is required for the success of any implementation. The following is a description of our common training; however, we customize training to

d.	CD/DVD, onsite, train-the-trainer, etc.) Prices/rates	accommodate client's preferences but we always use client data and business processes as part of our training. Because our training is customized to our client's needs we do not offer standard prices for a training class. Our pricing is dependent upon understanding client business processes, training goals, and required volume and type of training materials required.
		 Types of training includes: <i>Core Team Training</i> Typically occurs at the beginning of each phase, and each session will last approximately one day. This training will allow the core team for each division the ability to gather an understanding of the functionality of the Cityworks system. Topics include, service requests, work orders, GIS, assets, inspections, Inboxes, searching, and storeroom. Standard non-customized training documentation will be used for core team training. <i>Cityworks Administrator Training</i> Cityworks administration training will be provided for designated technical staff that will be responsible for the daily administration of the system. This training will occur at the beginning of the project, and again at the end of the project to ensure that administrators are able to maintain the system. Training that occurs at the end of the implementation will cover additional, more advanced topics. Administrator training will be used for beginning of project training, and the final administrator training will mostly cover information included in the completed Cityworks
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Report Writing Training

This training will cover the basics of creating a report for information coming out of the Cityworks system using the selected reporting tool. The goal of this training is to provide report writers knowledge of the Cityworks database structure and where information is stored within the database. Report writers will also learn how many of the Cityworks tables are linked to each other. Attendees of this class should have basic knowledge of report writing and familiarity with SQL Server databases. This training class with take two days, and customized training documentation will be provided.

Train the Trainer – End-User Training:

End-User training will be conduction by either client power users from each division. The train-the-trainer approach requires the power users/trainers to be involved during every aspect of the project to have a thorough understanding for why and how the system is configured. This allows power users/trainers to affectively answer questions as they come up during training. To support the end-user training. Black & Veatch will create a Training Plan that will describe the training sessions, topics covered, user roles to be trained in each session, class sizes, and class locations. Classes will be grouped by topic (work orders, service requests, etc.) and type of user (supervisor, field crew, etc.).

Additionally, Black & Veatch creates custom training materials for each of the sessions defined in the training plan. These customized training materials will be tailored to City of Ft. Lauderdale business processes, data, and

		Cityworks configuration. This training will occur at the end of each phase and each end-user will attend approximately two days of training, dependent on topics covered. Black and Veatch will also provide training support and backup for the City trainer. Cityworks also provides continuing training, information can be found at <u>www.mycityworks.com</u> . For additional information please refer to the Experience and Qualifications tab of our proposal.
12. Co	mpany Qualifications	
a.	Three or more years of related EAM system experience. Briefly describe.	Yes. Black & Veatch has been an authorized implementation and Silver Business Partner with Cityworks for more than 5 years. Additionally, our staff has over 10 years of Cityworks implementation experience. In addition, Black & Veatch staff is experienced with the implementation of a complete suite of EAM systems to provide our clients with the EAM system solution that best fits their asset management goals.
b.	Experience working with cities of our size. Briefly describe.	Black & Veatch has proven experience working with cities of similar size to the City of Fort Lauderdale. Examples include: Charlotte, NC (pop. 850,000), Escondido, CA (pop. 150,000), Tulsa, OK (pop. 400,000), Rock Hill, SC (pop. 70,000), and Greenville, SC (pop. 65,000).
c.Br	iefly describe your experience integrating the proposed solution with: - QAlert Cayenta (If needed)	Black & Veatch has not integrated with QAlert, but we have successfully integrated with other Citizen Engagement Platforms and are confident our experience will allow us to integrate with QAlert. In addition, our teaming partner, CH2M Hill, has proven experience integrating Cayenta with Cityworks.
d.	Briefly describe your experience integrating the proposed software with ESRI ArcGIS.	Black & Veatch is an ESRI business partner. We have a staff of over 50 GIS professionals and our core Cityworks implementation team has in depth expertise with geodatabase design, ArcGIS Server, ArcGIS implementation and installation. Our staff has built a number of customized tools on the ESRI toolset, including our iCIP tool, to aid municipalities with capital planning for asset management.
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13.0	ontract Termination for Default	None.
Please had a c default non-pe either determ a. b. c.	list all incidents in the past 5 years in which you have contract terminated for default. Termination for t is defined as notice to stop performance due to your erformance or poor performance; and the issue was (a) not litigated or (b) litigated, and such litigation nined you to be in default. Please provide: Full details of all terminations for default The other party's name, address and telephone Your position on the matter	
14. C fe o Please had a c conver any oth Please a. b. c.	Contract termination before contract completion or convenience, non-performance, non-allocation of funds, etc. list all incidents in the past 5 years in which you have contract terminated before completion (e.g. for hience non-performance, non-allocation of funds or her reason) provide: Full details of all such terminations The other party's name, address and telephone Your position on the matter	Black & Veatch Corporation, together with its affiliates ("Black & Veatch"), constitutes a large, international engineering and construction firm. Like similarly- sized firms, from time to time, we may be involved in projects that are suspended, cancelled or otherwise terminated by our clients for their convenience or for other reasons unrelated to Black & Veatch's performance. In the opinion of Black & Veatch management, no such instances would have a material impact on Black & Veatch's ability to execute this project.

Experience and Qualifications

The City of Fort Lauderdale will receive a GIS-centric, condition assessment-driven EAM system that can be scalable, City-wide.

Founded in 1915, Black & Veatch Corporation has grown into a leading global engineering, consulting and construction company with the mission of Building a World of Difference. By advancing the frontiers of knowledge, we provide our clients with reliable solutions to their most complex challenges, helping improve and sustain the quality of life around the world. To meet client objectives, we deploy optimally organized, multi-disciplinary teams built from our integrated global workforce.

For the City of Ft. Lauderdale we have assembled an expert staff that brings subject matter expertise in asset management, local understanding of the City systems, and a veteran EAM system implementation team with citywide implementation capabilities. *The City will strengthen its operational performance and infrastructure resilience through our tailored asset management solutions that are backed by our combined expertise in GIS technology and public works infrastructure.*

Black & Veatch is continuously ranked as one of the top engineering-design firms by Engineering News-Record (ENR). We have risen to the top of our field by providing: open and productive working relationships with our clients; effective project management; development and implementation of innovative and sustainable solutions for complex projects; and flexible project-delivery systems that meet aggressive budgets and schedules. *Our success is based on principles of sustainable development,* which means we focus on life-cycle economy, efficiency and reliability. Our employee-owned company has more than 100 offices worldwide. Black & Veatch is ranked on the Forbes "500 Largest Private Companies in the United States" listing.

Black & Veatch has been serving clients in Florida for more than 55 years, providing engineering services from our seven Florida offices, located in Coral Springs, Miami, Lake Worth, Fort Myers, Tampa, Orlando and Jacksonville.

The firm has more than 340 professionals in Florida with over 95-plus professional engineers registered in the state. These engineers are backed by Black & Veatch's century of experience providing services across a wide range of disciplines including civil, structural, water, wastewater, reclaimed water, geotechnical, environmental, electrical, and mechanical engineering, as well as construction, operations, science, economics, planning and finance. Our office locations in Florida and a list of our clients are illustrated in the following figure.



recordable injury rate

founded

leading global engineering, consu

and construction company.

global workforce



ENR RANKINGS

- 2 Telecommunications
- 2 Power
- 5 Water
- 9 Sewer and Waste
- 15 Top 50 Designers in International Markets
- 15 Top 500 Design Firms

Nestle of North America SRWMD Ocala Lakeland Suntory Water Group Hillsborough County TECO Hernando County Pasco County Seminole Electric Clearwater Tampa Bay Water Gulf Power Company Collier County FKAA North Miami

Emerald Coast Utilities North Port Lee County Electric Coop. Cape Coral Fort Myers Marco Island Tampa St. Petersburg **Progress Energy** Manatee County Sarasota County Key West Keys Energy Peace River Lauderhill Sunrise

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FLORIDA OFFICE LOCATIONS

Tampa Fort Myers Jacksonville Orlando

Coral Springs Miami Lake Worth

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Indian Springs Tallahassee Madison Jacksonville Beach JEA SJRWMD Gainesville Regional Utilities Flagler County Daytona Beach Florida Municipal Power Agency New Smyrna Beach **Orlando Utilities Commission** Seminole County **Kissimmee Utility Authority** St. Cloud Orange County **Reedy Creek Energy Services** Heartland Water Alliance Polk County Vero Beach Fort Pierce Utilities Authority Florida Power & Light **Highlands County** SWA of Palm Beach County SFWMF Hardee County **DeSoto County Cypress Energy** Hollywood Miami-Dade Water & Sewer U.S. Sugar Homestead **Deerfield Beach** Broward County WWS Palm Beach County WUD

BLACK & VEATCH TEAM

One philosophy guided how we selected the Black & Veatch Team: to provide the City with a **GIS-centric, condition** assessment-driven EAM system delivered by an experienced Team, led by a Project Manager with proven EAM system integration experience on projects similar in size and complexity to the City.

One philosophy guided how we selected the Black & Veatch team: to provide the City of Fort Lauderdale with a GIS-centric, condition assessment-driven EAM system, delivered by an experienced Team, led by a Project Manager with proven EAM system integration experience on projects similar in size and complexity to the City's.

The City will receive complete EAM system implementation support from our Team, which brings hands-on end-user and implementation experience with numerous EAM solutions, including *Cityworks, Accela, Cartegraph*, Infor, Lucity, Maximo and SAP EAM. Drawing on this experience, we offer a proposed solution using industry best-practices for the City's EAM system needs.

On the following pages are brief bios of the key members of our Team.



Mark Seastead will serve as our Project Manager. Mark has worked his entire career on these types of projects. He has a broad background in EAM systems deployment and implementation, having led EAM system projects for cities ranging in size between 10,000 and 1,500,000. Mark excels at aligning teams and stakeholders to meet expectations and schedules. *Leveraging his expertise in GIS and Asset Management, Mark will drive successful EAM system implementation to bring performance efficiency to City departments.*

Rafael Frias, our Project Director, has 19 years of experience and is a resourceful, take-charge leader who motivates others and will focus on maintaining close communication between the City and our project team. As the manager of our Florida and Caribbean operations, he will provide the City with access to Black & Veatch's pool of professionals and will commit the necessary resources for successful execution of this contract. Rafael's expertise is in stormwater management and he's proficient modeling in ICPR and SWMM. *He will coordinate with the EAM system implementation team to integrate the right data from the City's ICPR4 model into the EAM system and from the EAM system into ICPR4, helping the City maximize the use of available stormwater system data for asset management.*



Ricardo Vieira has more than 17 years of experience in civil engineering of piping systems, and specializes in the rehabilitation and replacement (R&R) of these systems as well as condition assessments for asset management purposes. *Ricardo has helped utilities develop comprehensive infrastructure assessments and replacement programs in support of life-cycle asset management for water and wastewater systems.*



Amanda Schwerman will serve as a Strategic Advisor on the use of the City's water and wastewater models for the implementation of the EAM system. Amanda's expertise lies in water and wastewater hydraulic modeling and she will coordinate with the EAM system implementation team to integrate the right data from the City's InfoWater model into the EAM system and from the EAM system into the InfoWater model to maximize the use of this data for asset management. Amanda is a certified Envision Sustainability Professional.



Matt Morey is a Regional Asset Management/Information Solutions Lead, and he will serve as the EAM system implementation technical lead. Matt specializes in GISenabled CMMS solution requirements development, systems implementation and refinement, report writing, and systems integration requirements development. Matt led much of the CMMS implementation for Oakland County, MI, Charlotte, NC and St. John's County, FL, which are considered some of the largest and most successful Cityworks implementations in the United States. *Matt will apply his experience and lessons learned for a successful implementation of the City's EAM system.*



Joe North has more than 10 years of experience providing asset management as well as CMMS selection and implementation services. He has successfully led CMMS implementation initiatives with the City of Charlotte's water utility and solid waste department and is currently providing the same services to Charlotte's Department of Transportation and Utilities, a nationwide water utility operator.



Walt Schwarz has over 40 years of professional consulting experience covering a broad spectrum of civil engineering projects for utilities, including the City of Fort Lauderdale under the WaterWorks 2011 Program. *His experience with the City will provide the EAM implementation team with strong knowledge of the City's water and sewer systems.* Walt is also experienced in managing large design teams and coordinating multiple efforts within a Capital Improvement Program (CIP).



Engineering



RADISE

Maurice Tobon has more than 25 years of experience in water and wastewater engineering in South Florida. He served for more than 15 years at the highest management levels of two of the largest water utilities in south Florida (Palm Beach County and City of Fort Lauderdale), and was responsible for nearly \$1 billion in program management capital improvements. Having worked in government for many years, Maurice understands the issues faced by water and wastewater utilities. *He will support the EAM system implementation team by coordinating with the City's water, sewer and stormwater departments to leverage the use of their models.*

Blake Guillory serves as President of RADISE International and is responsible for the overall performance of the firm, and is engaged every day with clients and projects. He has worked on hundreds of civil and water resources infrastructure projects, including master planning and design for water, wastewater and stormwater utilities, civil site engineering, surface water hydrology and hydraulic modeling, water quality, permitting, specifications and construction services. **Blake will leverage his expertise in water, wastewater and stormwater management to lead RADISE's data transfer efforts required for the implementation of the City's EAM system.** The following organizational chart shows how the Black & Veatch Team is set up for successful implementation of the City's EAM system.



The Black & Veatch Team provides a Project Manager with proven experience implementing comprehensive EAM solutions, and with expertise in GIS and Asset Management. Our EAM systems experience and GIS and asset management expertise will enable us to deliver improved performance and efficiency by fully leveraging GIS.

Our Team includes CH2M who possess significant condition assessment experience with the City of Fort Lauderdale to ensure that the right condition assessment information is successfully integrated into the EAM system.

In addition to its EAM system implementation and condition assessment experience with the City, *CH2M was selected to be part of our Team for the following reasons:*

- Black & Veatch and CH2M enjoy a successful history working together.
- CH2M's experience working with the City's public work infrastructure, coupled with Walt Schwarz's specific knowledge of the City's water and sewer systems.
- CH2M is a Platinum-level implementation partner with Cityworks and brings specific expertise integrating Cityworks with third-party products, such as Cayenta, Lawson, Cognos, SAP Business Objects, Crystal Reports and Laserfiche, which are of relevance to the City.

Time will be optimized with our Team – we have members who are already up-to-speed, know the City's preferences and need for asset management best practices. CH2M Hill is a **Platinum level implementation partner with Cityworks** and brings specific expertise integrating Cityworks with third party products, such as **Cayenta**, **Lawson, Cognos, SAP Business Objects, Crystal Reports and Laserfiche**, which are of relevance to the City. Our local Black & Veatch office is within 16 miles of the City's offices, which will enhance our responsiveness to City staff.

Proximity to the Project

We are committed to providing responsive service to the City of Fort Lauderdale by offering a core project team that will be fully accessible to City staff.



Guarantee of Team Continuity

The City of Fort Lauderdale has our pledge that the key members of our Team will remain as proposed and assigned to this contract for its duration. If any substitution is necessary after the project is underway, we will request the City's approval in advance before making any key personnel changes.

EAM SYSTEMS QUALIFICATIONS AND TECHNICAL EXPERTISE

Our engineering-led team has the proven EAM system integration expertise that will result in successful implement the City's EAM system, ensuring compliance with future regulatory requirements.

Black & Veatch is a Silver-level Cityworks Implementation Business Partner. Our key implementation staff has more than 10 years of experience implementing Cityworks for utilities. *We have a level of practical expertise developed from the successful completion of more than 50 CMMS/EAM implementations across a wide range of project sizes and types*, including water, wastewater, stormwater, transportation and roads, city facilities, fleet, harbors, solid waste, parks and recreation, sustainability, engineering services, materials management, and more.

Black & Veatch is a **Silverlevel Implementation Business Partner of Cityworks.** Our key implementation staff has more than 10 years of experience implementing Cityworks for utilities.

Rooted in our experience evaluating, selecting, and implementing a wide

range of CMMS/EAMS solutions for municipal clients, our philosophy for evaluation and selection is that any of the major, reputable systems will meet 75-85% of an organization's functional needs. Because of that, *we select and implement EAM systems based on:*

- Understanding the unique characteristics and capabilities for each solution and how that uniqueness maps to client requirements.
- Having an innate knowledge of business practices and processes to help municipalities evaluate whether their current practices and work processes are optimal for automation.
- Understanding how various solutions can be configured to fit client practices and processes – not changing their processes to fit software limitations.

We will help the City select the right CMMS/EAMS software solutions to fit its needs. Our expertise includes evaluating, selecting, utilizing, and implementing solutions from vendors such as Azteca Systems (Cityworks), Infor, IBM and Lucity, among others. The table in the section below showcases the vendor systems our team has experience with.

EAM SYSTEMS PROJECT EXPERIENCE

Although our team is experienced in the most common vendor solutions used in the industry, no consultant can be knowledgeable about all possible software packages. For that reason, Black & Veatch maintains relationships with specialized implementers for solutions our team might not have handson expertise working with, such as SAP, Oracle, and others, so we can continue to provide comprehensive CMMS/EAMS services to our clients.



CMMS / EAMS System Selection

Our approach is centered on 3 core points: We are vendor-agnostic. We bring deep knowledge of the business processes and practices of municipalities. And we have the ability to draw on focused technical systems integrator partners when needed while still maintaining neutrality. As a result, our team can evaluate, select and implement the right CMMS/EAMS solution for the City. The table below provides examples of Black & Veatch's EAM systems representative experience.

Representative Sample of Black & Veatch's EAM Systems Implementation Experience

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City of Indianapolis / Marion County; IN					_	
Utilities, Inc.; AL, FL, GA, IL, NV		_				
City of Escondido; CA		_				
City of Winston-Salem; NC						
City of Overland Park; KS						
Nashville Metropolitan Water Services; TN						
Hampton Roads Sanitation District; VA						
Board of Public Utilities of Kansas City; KS						
City of Greenville; SC						
Jackson Energy Authority, TN						
Salt Lake City, UT						
City of Mesa, Signal Butte Water Treatment Plant; AZ						
Tulsa Metropolitan Utility Authority; OK						
City of Memphis; TN						
City of Topeka; KS						
City of Highland Village; TX						
County of Spotsylvania; VA						
City of Rock Hill; SC						

BLACK & VEATCH'S APPROACH TO EAM SYSTEMS SELECTION AND IMPLEMENTATION

Requirements Definition

Our approach to any CMMS/EAMS solutions is one founded in the philosophy that "business should drive technology" – not the opposite. Defining the City's specific functional and technical requirements in support of it's the organizations

business practices and processes was one of the most important parts in the preparation of this proposal.

Our approach was to analyze existing practices and processes and translate those into capabilities (functional requirements) that the system must support. *Our team analyzed topics such as:*

- How work is identified, prioritized, assigned, scheduled, and completed
- Data management needs with regard to asset performance information
- Preventive and predictive maintenance programs and the corresponding requirements of the CMMS/EAMS solution
- Reporting, performance metrics, and "dashboarding" needs
- General system design and features
- Assets
- Work orders/project management
- Service requests/call center
- Warehouse/inventory/materials management
- Reporting
- GIS/mapping capabilities
- Mobile (paperless) capabilities
- Integration with other systems and technologies
- Technical platform requirements

Information Technology (IT) was also an important part of this process. Coordination with IT is important to facilitate the likely integration with other key systems within the organization (human resources, finance, SCADA, etc.).



SYSTEMS IMPLEMENTATION

Black & Veatch will partner with the City to implement the EAM system within its identified departments. Our assistance can take many forms – from serving in a coaching/consulting role for a City-led implementation, to providing full-scale implementation, integration, training, and go-live services. We will tailor our role and approach to meet your organization's skills, capacity and needs. *Our full-scale implementation approach typically consists of the following major activities:*

Core Team Training. Training an initial group of power users who can inform client staff on system functionality and associated configuration decisions that will be required during implementation. This will allow the City to make informed configuration decisions during the process.

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System Configuration. Core system configuration to support the asset and maintenance management processes of the City. This effort typically includes both base system configuration as well as configuration of associate mobile modules and devices to facilitate a field-enabled workforce. This stage of an implementation is also a good opportunity to evaluate current work processes and make adjustments to optimize where appropriate.

- Data Assessment and Migration. Identification of historical asset and maintenance data that might be migrated to the new solution as well as the actual migration of said data. Key points of emphasis in this task are data cleansing efforts as well mapping source data from historical systems to the target locations in the new system.
- Systems Integration. Development of required integrations with other City information systems (such as GIS, financial management (Lawson), human resources, SCADA, document management (Laserfiche). Efforts here will typically include coordination with IT (or other system vendors) to identify recommended integration methods, system of record for specific data, and workflows that enable accurate and efficient sharing of information between systems.
- Acceptance Testing. Testing and acceptance of configured CMMS/EAMS solutions and associated integrations.

- Report Development. Development of business intelligence reports required by the City to realize the value of the system. We can develop these reports and, more importantly, train City staff on the data structures and report authoring software/process such that the City can develop and maintain these reports without consultant assistance in the future.
- Training. Our team can support many training approaches to enable City staff to use new CMMS/EAMS solutions. Approaches can include full end-user training including the development of tailored training classes and materials, and delivered to the entire workforce. Or, a train-thetrainer approach where our team works with your staff to enable inhouse training of personnel.
- Go-Live Support. Flipping the switch on the system is not the end of the process. We have found that having dedicated staff on-site and in the field with personnel to assist with the transition to a new CMMS/EAMS solution can be very beneficial to managing the roll out of a new system as well as providing a more responsive support infrastructure during go-live.

Black & Veatch will partner with the City to realize the maximum value for its water, wastewater and stormwater infrastructure assets.

Our vendor-neutral approach for evaluating and selecting CMMS/EAMS solutions will allow us to focus on the City's needs and priorities, and truly identify the best solution. It is based on a mix of business and technical expertise with a philosophy that business needs should drive technology decisions.

Our implementation approach builds on that philosophy to empower the City to manage and maintain its EAM system into the future. *Implementing the EAM system around an Asset Management framework will provide the City with a roadmap for future improvements that moves beyond just the EAMS computer system.* Our approach aims to help the City transform its maintenance practices from reactionary to proactive and eventually predictive.

Our approach aims to help the City transform its maintenance practices from reactionary to proactive and eventually predictive.

EAM SYSTEMS REPRESENTATIVE PROJECTS

JACKSON ENERGY AUTHORITY | CITYWORKS IMPLEMENTATION; JACKSON, TN

The Jackson Energy Authority (JEA) is three years into a ten-year program to reduce sanitary sewer overflows (SSOs), to reduce infiltration and inflow (I&I), and to rehabilitate the sanitary sewer system. During this phase of the project, Black & Veatch implemented Cityworks to track work performed against JEA's wastewater assets to support the overall program. The implementation included water assets as well.

System Implementation

- Replaced a largely paper-based work order tracking system,
- Designed the system to accommodate integration the JEA's utility billing system (CMB).
- Installed and configured Cityworks for water and wastewater, while maintaining an understanding that the electric and gas divisions would be using the system in the future.
- Developed customized print templates using Crystal Reports so that JEA staff could produce standardized forms (street cut permit, customer notifications...) worked with JEA's IT staff to assist with the integration of Cityworks to their utility billing system.
- Prepared customized training materials for end-user training.
- At go-live, we were on-site to assist in addressing any problems that might have surfaced and provide additional one-on-one training as needed.

Key Team Members: Mark Seastead, Traci Berlingieri, Rob Wachal, Matt Morey, Joe North, Bryan Dickerson, Shelley Hill and Kelli McRae

SALT LAKE CITY | CITYWORKS IMPLEMENTATION; SALT LAKE CITY, UT

Salt Lake City has commissioned Black & Veatch to collect asset data and implement Cityworks at the Salt Lake City Water Reclamation Facility, to replace their existing MP2 work order system. The implementation involves integration with the city's GE SCADA system to automatically create work orders for preventive maintenance activities and when alarms are activated.

Relevant project features

- Developed a GIS database (geodatabase) that was designed to store vertical assets in a plant environment. After the design was complete, the ESRI Collector application was used to collect assets with associated details and pictures. More than 2,000 asset records were collected.
- Reviewed O&M manuals for all the asset types that were collected as part of the asset data collection. The information gathered during this task feeds the Cityworks configuration and the integration with SCADA.
- Worked with plant staff to understand and document their work flows for maintaining the plant.
- Determined the information that is to be produced out of the system to support report requirements.
- Designed the system configuration.
- Setup the system and installed Black & Veatch's PlantWorks asset hierarchy navigation tool.
- Created customized training materials for all users.
- Provided Go-Live support to assist users.
- Integrated Cityworks to the City's SCADA system through GE Workflow.
- Triggers were setup to create Cityworks work order for preventive maintenance activities based on equipment run times and alarms.

Key Team Members: Mark Seastead, Matt Morey, Joe North, Traci Berlingieri, Kelli McRea and Shelly Hill

CITY OF ROCK HILL | CITYWORKS UPGRADE & EXPANSION; ROCK HILL, SC

The City of Rock Hill had implemented an older version of Cityworks that had gone largely unused. The city commissioned Black & Veatch to upgrade its system to the latest version, and update the configuration to support the hydrant flow test program and facilities maintenance division.

Relevant project features

- Worked with City staff to update Cityworks to the latest browser-based version that utilized current GIS technology
- Provided Cityworks Administration training for city staff.
- Developed a report to produce the flow test results required by the state and Fire ISO certification.
- Developed custom training documentation for end-users and provided training for city staff.
- Started the implementation by working with city staff to understand and document their work processes.
- Review the asset registry to ensure that it was setup to best leverage the new system.
- Worked with the City's Cityworks administrator to setup the Cityworks system to support the division.
- Created customized training materials and supported the City's staff in training facilities' users.
- Go-Liver support was provided to assist users as they began using the system.

Key Team Members: Mark Seastead, Matt Morey and Joe North

CHARLOTTE DEPARTMENT OF TRANSPORTATION | CITYWORKS IMPLEMENTATION; CHARLOTTE, NC

The Charlotte Department of Transportation (CDOT) has selected Black & Veatch to implement Cityworks for their Streets Maintenance, Traffic Operations, Public Service, and ROW divisions. The implementation of Cityworks was initiated to replace CDOT's existing work order management system (Hansen).

Relevant project features

- Worked with CDOT staff to understand and document the organization's business processes.
- Defined the reporting requirements to replace existing reports and provide additional reporting out of the new system. Designed a system configuration that supports the processes CDOT staff work through daily.
- Developed integration requirements to integrate Cityworks with the City's 311 system, Charlotte Water's Cityworks system, and Charlotte Stormwater's Cityworks system. These integrations are designed to allow for better work coordination between City departments
- Supported City staff during the integration of each system and develops test plans to ensure the integrations are complete.
- Installed and configured Cityworks for streets maintenance, while maintaining an understanding that other CDOT divisions would be using the system in the future.
- Modified the user interface to ensure that the system is easy to use for all users.
- Prepared customized training materials for end-user training and CDOT administrators.
- Provide immediate assistance should any problems surface and additional one-on-one training should users need it

Key Team Members: Mark Seastead, Matt Morey, Traci Berlingieri, Joe North and Shelly Hill

CHARLOTTE AREA TRANSIT SYSTEM | CITYWORKS IMPLEMENTATION FOR CUSTOMER SERVICE; CHARLOTTE, NC

Following a successful phase 1 implementation for its Facilities Management division completed by the key team members listed here, Charlotte Area Transit System (CATS) commissioned Black & Veatch to assist with the implementation of Cityworks for their Customer Service division.

Relevant project features

- Migrating to the existing Cityworks environment allowed CATS to eliminate a system and provide better support with a commercial off-the-shelf application.
- Assisted in modifying the Cityworks user-interface to provide similar field capabilities that the legacy system had.
- Developed a custom plugin to allow users to look up and select bus driver information based on their employee number.
- Provided training support for CATS staff.
- Performed all data mapping and cleansing to prepare the data for migration.
- Imported the data into the new system.
- Worked with CATS staff to develop reports which pointed to the new system that provided enhanced reports and included previous KPIs with additional detail.

Key Team Members: Mark Seastead, Matt Morey, Joe North and Traci Berlingieri

SEMINOLE TRIBE OF FLORIDA | CITYWORKS IMPLEMENTATION AND SYSTEM SUPPORT - CH2M

The Seminole Tribe of Florida (STOF) Public Works Department (PWD) is committed to the development of a proactive and comprehensive Asset Management (AM) program. STOF requested CH2M to assist with the establishment of a framework to support effective and efficient management of assets at their water treatment plants (WTPs) and with the identification and implementation of an appropriate computerized maintenance management system (CMMS) and at one of four WTPs targeted for CMMS usage.

CH2M worked in collaboration with STOF operations and maintenance staff and management to understand and document the existing business processes and develop a future vision for a continuous improvement. Azteca's Cityworks CMMS program was selected as the best program for improved asset management decision making. CH2M and STOF coordinated upgrades to existing GIS data and schema, gathering information including but not limited to: types of customer service requests; reactive and preventative maintenance activities; staffing; vehicles and equipment; and materials, parts and supplies. CH2M and STOF coordinated on data gathering activities, initial software and hardware configuration, and initial program configuration. CH2M is supporting implementation of a software upgrade.

Relevance to City of Fort Lauderdale

- Software selection and implementation
- Identification of a strategic framework under which to select and configure software
- User acceptance and training

Key Team Members: Emran Rahaman

APPROACH TO MEETING PROJECT SCHEDULE AND BUDGET

Budget and Schedule Control

At the commencement of the project, the Black & Veatch project manager will define project scope, schedule and budget in consultation with the City's project manager. Our project manager will closely monitor and measure critical path activities to deliver the project on time and on budget.

Black & Veatch's Project Controls system, complete with budget information, will be used to track time and cost expenses for earned value (EV) reporting on all aspects of each project with the City. EV is a method of reporting project performance in terms of schedule and budget. Every month as part of the invoicing process, the EV of each activity is computed based on the percent complete of each task and the budget expended. This process reveals problem tasks in terms of budget or schedule (or both), allowing for timely corrective actions.

Our Project Controls system and commitment to accountability for change are crucial to meeting quality and budget goals, and will save money by preventing cost overruns.



Our proven project management plan will make the City's project easier to implement, improves quality, eliminates rework, and keeps the project on budget and on schedule.

Ability to Meet Time and Budget

There are numerous factors that drive the need for timely project completion. These include meeting regulatory deadlines, bringing additional capacity online ahead of growing demands, or simply working within the fiscal schedule established by the City's funding process. Completing projects within budget is equally as important to the City's overall budgeting process and to meet City administration and general public expectations. Black & Veatch approach quality, schedule, and budget performance with the highest priority.

It is standard procedure for Black & Veatch project managers to develop a project schedule and engineering budget at the onset of every assignment. They use powerful tools to track schedule and budget progress, including our project accounting network (**Insight**), which makes data on project charges available within one-day of reporting. This supports timely adjustments to ensure that the appropriate level of effort is being expended to complete the work on time and under budget.

The table on the following page summarizes our success meeting the engineering budget on previous assignments completed under continuing services contracts.





TASK AUTHORIZATION ASSIGNMENTS	PERFORMANCE
WASD: Bond Engineering Contract (2012-2015) Tasks 1 thru 22	On Budget
WASD: Bond Engineering Contract (2009-2012) Tasks 1 thru 16	On Budget
Broward County: North Regional Wastewater Treatment Plant Outfall Pump Station Repairs	Under Budget
Broward County: North Regional Wastewater Treatment Plant Aeration Shrouds Replacement	On Budget
Broward County: Master Wastewater Pump Stations Wetwell Refurbish	On Budget
Key West: O&M WWTP, Sanitary and Stormwater Sewers	On Budget
SFWMD: IT Shelters Replacement Construction Management Services	Under Budget
SFWMD: S-127 Automation Construction Management Services	On Budget
Lakeland: Disinfection Alternatives Evaluation	On Budget
Lakeland: Disinfection Facility Upgrades Preliminary Design Report	On Budget
Lakeland: Williams WTP Process Control System Upgrade Design	On Budget
Tampa Bay Water: Surface WTP Expansion Construction Management & Program Management	Under Budget
Hillsborough County: River Oaks Sinkhole Remediation	Under Budget
Hillsborough County: NWRWRF 36 th Isolation Valve Replacement	Under Budget
Hillsborough County: Armand Drive Gravity Sewer Replacement	Under Budget
Hillsborough County: Gunn Hwy. Utility Relocations	On Budget
St. Petersburg: Water System Vulnerability Assessment	Under Budget
St. Petersburg: Oberly P.S. Improvements (BODR)	Under Budget
Combined	> \$2 Million Under Budget

Our goal is to improve the sustainability of the City's infrastructure not only in technical performance, but also from a social, environmental and economic perspective.

SUSTAINABLE PRACTICES

Black & Veatch has a corporate commitment to *"sustainable solutions that build value through products, services and operations while balancing financial, community and environmental needs."* One way we fulfill this commitment is by helping clients develop solutions that incorporate their goals and concerns relative to environmental stewardship, community involvement, resource management, and climate change.

Black & Veatch's Goals for providing Life-Cycle, Sustainable Solutions to the City

We can effectively address the needs of the City in achieving its commitments to sustainability, by:

- Incorporating the environmental, social and economic considerations of the project. Our approach will encourage City and stakeholder participation throughout the conceptual, development and commissioning phases.
- Identifying alternatives, process improvements, standards, and technological advances to promote the effective and efficient use of resources, including labor, building materials, process materials, energy and other resources. Approaches we might consider adopting include

Envision, the US Green Building Council's Leadership in Energy and Environmental Design (LEED) program, and *ISO 55001, as a framework to develop a life-cycle, asset focused management approach throughout an organization.*

- Considering strategies, performance standards and levels of service that can promote asset optimization, rehabilitation, renewal or replacement.
- Improving our project delivery based on feedback from the City as well as our own self-evaluation and performance assessments.
- Promoting the creativity, innovation and thought leadership of our staff through ongoing training, professional leadership in the industry and ongoing active participation with peers and the City.

Black & Veatch has made an ongoing commitment to promoting sustainability by adopting this principle as one of our four corporate Drive for Value cornerstones *(Drive for Value: Sustainability)* along with advancing our effective client services, supporting our people, and enhancing project execution. These commitments are demonstrated by Black & Veatch's nationally and globally acclaimed achievements for successful project completion and range from the development of renewable energy programs involving solar, wind, tidal and biomass sources in addition to projects involving traditional fossil-based generation.

Leadership at the Water-Energy Nexus

Black & Veatch is a leader in innovative and advanced technologies that promote water supply conservation, including the use of desalination, water reclamation and wastewater recycling. On the management side, we drive more effective use of existing investments through asset management and optimization planning of water, energy and telecommunication infrastructure systems, including Smart Grid applications. The graphic below provides examples of our sustainable water and energy solutions.



Black & Veatch Internal Applications of Sustainability Principles

We also "walk the talk" by incorporating sustainability principles and practices into our operations. Examples include:

- Office-specific carbon foot printing assessments
- Operation of a fleet of hybrid vehicles
- An industry-leading commitment to office and field personnel health and safety
- Monitoring and adapting building systems to manage energy and resource consumption
- Active involvement in community programs
- Ongoing training and career enhancement for staff
- Delivering thought leadership in the need to advance the application of sustainability principles

Approach to Scope of Work

UNDERSTANDING OF CITY'S NEEDS, GOALS AND OBJECTIVES

The City requires the implementation of an EAM system that is scalable and integrates well with its current technologies, including ERP Infor/Lawson, Cayenta, Laserfiche and Q-Alert. The Black & Veatch team's recommended solution involves the implementation of Cityworks, which is a GIS-driven, EAM system that can be expanded to all City Departments. Our Team has proven experience integrating Cityworks with Cayenta and other existing City technologies, which will provide the City with a cost-effective and expedited implementation through seamless integration with current technologies.

Black & Veatch understands that the City desires an integrated "off-theshelf" EAM system that will meet its core requirements with minimal modifications. *We have successfully implemented over 50 EAM systems, and through them have developed a number of best practices, including:*

- Understand Business Processes: The work management system configuration we provide will be grounded in understanding how the software will function within the City's business processes, as these processes will drive the implementation, not the software.
- Ease of Use: A system that is complicated or hard to use is likely to have poor end-user acceptance and the overall success of the project may be lessened. With this in mind, the Black and Veatch's implementation team will take extra effort to ensure that the system is easy to use. This may be as simple as removing fields, or inserting some custom logic in a work order screen to automate a process. In our experience, ease of use is directly related to an understanding of business processes.
- Flexibility: The City will standardize on a single Cityworks solution, but that does not mean that one size fits all users. We understand the needs of users will grow and change through time and our Cityworks implementation is intended to allow each user group to expand and evolve its usage of Cityworks both internally and in conjunction with other City users. We have direct experience working with 3rd-party systems like Cayenta and Lawson.

Black & Veatch staff has worked with many of the major EAM system vendors and has hands-on experience with implementation, configuration, training and support with tools like *Cityworks, IBM Maximo, InforEAM, Lucity, SAP Plant Maintenance, Synergen, OracleEAM, MP2, Hansen, Infor Public Sector, Nexgen, Cartegraph, VueWorks,* and many others. Based on our experience with these tools we understand no

single system will meet 100% of the City's needs. However, based on key



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Custom Screen developed to streamline data entry

requirements such as a strategic emphasis on GIS, there are certain products that will far outperform others.

The following table provides a brief summary of some key RFP requirements compared against several of the EAMS/CMMS solutions that the City may have been considering. You will see that Cityworks meets the greatest number of the requirements. What is NOT shown in this table, and what is arguably more important, is how a software solution can meet a specific requirement. For example: the City had a requirement of GIS integration and all of the products on the table met that requirement. However, if you refine that statement to *"a single GIS & asset database" then there is only one product that fits that requirement – Cityworks.*

General RFP Requirements	Cayenta / Geonexus	Accela	Cityworks	Lucity	NexGen	Utility Cloud
EAM System						
Preventive and Planned Maintenance Scheduling (to assist with CIP Planning)					•	
Work Management (e.g. WO Generation, Work Planning Tools)						
Work Order Billing						
Service/Customer Relationship Management, including Customer Portal (issue or incident logging)	•		•			
Comprehensive Audit Trail and Reporting Capability						
Budget Model to Assist with Funding Requests						
Parts/Supplies Inventory						
Asset Management						
Asset Record Tracking						
Asset Accounting (Budgeting, Depreciation and forecasting.						
Condition Assessment						
Risk/Financial Analysis			2	2		
Asset Lifecycle Management			2	2		
Human Capital Management						
Field Inventory and Data Collection						
Dynamic Master Planning Capacity			2	2		
Capital Planning Functionality			2	2		
Planning and Reporting (CMOM)						
Technical Requirements						
ESRI GIS Integration						
GIS Mapping						
Interface Flexibility/Customization						
Open Platform API and SDK						
Comprehensive and Granular Security						
Local Hosting & Cloud Hosting Capability						
Single GIS & Asset Database						
Easily Streamlined User Interface						
Other						
Fleet Maintenance and Management of Vehicles						

Requirement is met. 2 – Requires 3rd party assistance.

Based on the City requirements and our team's EAM system experience, Black & Veatch recommends Cityworks as the EAM system solution for implementation. Cityworks is a solution that will allow the City to leverage its investment in GIS and continue its enterprise, GIS-centric data sharing approach. *Cityworks will provide the City with the greatest functional capabilities, integration with GIS, and ability to meet its long-term asset management goals involving business process mapping, data, systems and people.*

EAM SYSTEM IMPLEMENTATION APPROACH

The City has a need to leverage data from its GIS, water, sewer and stormwater models into the EAM system. The Black & Veatch team provides the technical resources, with expertise in InfoWater and ICPR4, to maximize data integration between the EAM system and its InfoWater and ICPR4 models, and optimize its assets through reliability-centered maintenance.

Black & Veatch's EAM system implementation approach will define the City's specific functional and technical requirements in support of its business practices and processes. *It is organized into two phases:*

- Phase 1. Implementation and Integration of the Stormwater, Water, and Sewer Systems (per answer 38 of Q&A document).
- Phase 2. Implementation and Integration of the Water and Wastewater Treatment Facilities (to be performed as a future phase per answer 38 of Q&A document).

We recommend this two-phase approach for several reasons including:

- A phased implementation allows the system to be put into use faster
- Less likely to require system re-engineering for missed requirements
- Learning from Phase 1 typically increases the implementation efficiency of later phases.
- Facility implementations tend to require more time and data collection due to increased variety of asset classes
- Increased knowledge transfer having City staff take a more active role in Phase 2 promotes knowledge transfer.

The following section provides a detailed description of the tasks that will be performed as part of our recommended two-phase approach.

Task 1 Project Management

The Black & Veatch team chosen for this project has a proven track record of on-time and within-budget delivery of similar projects. If there is a single reason for our success, it is our uncompromising commitment to working as partners in projects to achieve clients' organizational goals.

Our two-phase approach will allow for efficient implementation of the EAS system with minimal disruptions to City staff and its operations. Our project management team has more than 50 years of combined experience in executing projects to develop asset management programs and implement EAM/CMMS and GIS solutions in support of those programs.

Black & Veatch will provide ongoing direction and management of the project including review of staffing, budget, progress, and quality of work. Project status reports will be provided to the City with each invoice and at the completion of each major task of the project. Our managers will also be focused on schedule, recognizing that this is a critical success factor for the project. The following work plan will serve as the basis for the schedule. This plan balances speed and risk based on our EAM experience. There are opportunities to accelerate certain functions which we will thoroughly discuss with the City to find the best approach.

Task 2 Hardware Consulting, Design, and Installation

Tasks 2.1 EAMS Existing Systems Analysis

The Black & Veatch team will need to become familiar with the City's current technical environment. This includes reviewing:

Task 2.1.1 Review Current Technology Standards

Standards are provided in sections 3.2 through 3.9 of the RFP. There are not any currently known conflicts between our proposed Cityworks solution and the City's defined environments. However, Black & Veatch would like to more formally review this for conflicts.

Task 2.1.2 Review Systems Integrations

Potential systems that are candidates for integration with EAM solution:

- MS Office Suite
- Laserfiche
- Cayenta Utility Billing & Work Management
- Qscend Qalert CRM & QAlert Mobile
- Cognos 7.4, 8.3, and 8.4
- Crystal Reports 11 and 2011
- SAP Business Objects XI 3.1
- Info/Lawson Financials (Planned ERP system to be implemented)

Black & Veatch team members and City staff will meet to review system requirements to prioritize integrations. The result of this review will be a memorandum of recommendations prioritizing integrations and outlining next steps for systems and data mapping, data flow, security requirements, business processes, and data requirements. However, it is anticipated that initial integrations will be focused on Infor/Lawson and Cayenta.

Task 2.1.3 Mobile & Computing Platform Considerations

The City has identified the workstation and mobile environments. Black & Veatch will work with City staff to understand how the EAM system will be

deployed and, if needed, a hardware-procurement effort prior to go-live with the initial system. Additionally, in this task we will address mobile computing requirements and any potential challenges that may arise between City technology standards and mobile device access.

Task 2.1.4 Server ArchitectureA review of existing server architecture will occur for the following:

- GIS database environment
- ArcGIS server
- Application servers
- Reporting servers
- Systems integration servers

The result of this task will be a conceptual architecture that identifies Cityworks system design, linkages to GIS, application servers, report servers and key linkages to integrations.

Task 2.2 Business Process Mapping

Identifying and understanding the business processes of an organization is a critical step in implementing any software solution. To-be business processes are created that reflect how each process is completed within the



Business Process Documentation

Cityworks environment. The goal is to identify where Cityworks is used throughout the process and the roles involved.

Business process workshops are held in order for the Black & Veatch team to thoroughly understand the way business is done. Black & Veatch will translate all of the information collected in to Visio diagrams depicting how the processes will work within Cityworks. These to-be business process diagrams are reviewed with the client and, when finalized, become part of the Configuration Design document. To-be business processes are one piece of the foundation of the Cityworks configuration and are used to be more detailed in training staff.

For each implementation group (water, sewer, stormwater, water treatment facilities, and wastewater treatment facilities) Black & Veatch will hold up to five (5) days of process workshops to identify existing processes and create To Be business processes. Workshops will be held over one (1) week. It is anticipated that maintenance practices for the distributed asset in Phase 1 will be similar and thus generally reusable for each implementation group. We understand that specific and unique functions may exist for specialized assets such as pump stations and storage tanks as well. Black & Veatch will provide draft and final to-be workflows in MS Visio and Adobe PDF format.

Task 2.3 Configuration Plan

At the conclusion of Task 2.2, each implementation group will be ready to commence the configuration planning phase. This phase builds off the business processes, but focuses on the Cityworks system design and implementation. It will depend on the completion of core software installation and core team training provided as part of Task 3 – Installation and Configuration of all Components.

Cityworks Configuration Design: Prior to beginning system configuration, the design of the system will be documented in the Cityworks Configuration Plan. This plan will begin with information gathered from the business process review (Task 2.2), mobile and computing platform requirements (Task 2.1.3), system integration requirements (Task 2.1.2), data migration requirements (Task 5), and reporting requirements (Task3.4). The project team will then conduct a series of configuration workshops to build upon this information, focusing on the following topics: service requests, work orders, inspections, assets, materials and storeroom, equipment, employees and security, custom fields, and user interface modifications. Information obtained during the workshops will be used to complete the configuration plan.

As each implementation group is implemented, the Configuration Plan will be updated to include the addition of that group's configuration details. After each time the Configuration Plan has been created/updated, the City will have the ability to review the configuration design prior to system configuration taking place for that group. Once the design is approved, system configuration will begin. The Configuration Plan document will be a living document and will be updated throughout the project to reflect the actual configuration of Cityworks as completed.

Once the configuration design is complete, a Cityworks Configuration Test Plan will be developed to test the system when configuration is completed. Information within the test plan will be gathered from the Cityworks Configuration Plan to ensure that the system is configured as designed. This test plan will outline the methodology for testing the integration including identifying tester roles, use cases, test scripts, and final acceptance procedures.

Task 2 Deliverables

- Technical memorandum describing how the Cityworks solution will fit within the City's established technology standards.
- Technical memorandum describing prioritized integrations with Cityworks that includes next steps for systems and data mapping, data flow, security requirements, business processes, and data requirements.

- Technical memorandum describing the mobile and computing platform including recommendations on procurement of any new end user hardware and potential challenges between City technology standards and mobile device access.
- Conceptual Cityworks Architecture Diagram.
- 10 days of process workshops per implementation group spread over two
 (2) separate one (1) week intervals.
- Draft and final business process diagrams in MS Visio and Adobe PDF format.

Assumptions:

- The specific systems, data that will need to be shared, and integration methods are not currently defined at this time. Therefore, Black & Veatch has allocated an as-needed allowance for systems integration design and development support, as outlined in the fee schedule.
- Business processes for the distributed assets for water, sewer and stormwater are managed similarly (i.e. reactive maintenance, preventive maintenance and inspections).

Task 3 Installation and Configuration of All Components

Task 3.1 Core Software Installation

Black & Veatch will work hand in hand with the City Project Manager, IT staff, and the City's designated Cityworks Administrator to install the core Cityworks environment along with other required software. The

Black & Veatch implementation team will install a core development, test/train, and production environment to facilitate knowledge transfer, establish a local sandbox and a core team training environment capable of being accessed by City identified mobile devices, laptops, and desktop computers. This is a one-time activity that will be completed for all three implementation groups at the same time as each system (water, sewer, and stormwater will be housed in the same Cityworks and GIS database).

Task 3.2 Core Team Training

It is important that the City be an active participant in configuring the system to best support City business processes and workflows. To accomplish this, *Black & Veatch recommends conducting core team training with a select group of City power users. This will allow the implementation team to tailor the configuration of the EAM solution to specific requirements and work processes defined in earlier tasks.* The training will provide City staff with enough background on system functionality such that staff, working with guidance from the Black & Veatch implementation team, can make informed decisions regarding configuration in subsequent tasks. This will allow staff to better understand how the

software functions and what some of the various configuration options are prior to being asked to make decisions on those topics during actual system configuration.

Following configuration of a training environment in Task 3.1, Black & Veatch will conduct core team training for the identified core team members. Prior to training, logistics will be coordinated with the City project manager including facilities, schedule, and device requirements (e.g. mobile devices to facilitate training on native mobile applications).

Black & Veatch typically recommends three days of core team training covering the following topics, regardless of system being implemented:

Day 1

- Working with asset records understanding hierarchy, positions/locations, and/or relationship to GIS
- Utilizing map functionality
- Learning the reactive workflow related to service or work requests
- Creating service or work requests, geocoding request location on the map, etc.
- Searching work activities

Day 2

- Examining the preventive workflow associated with work orders
- Understanding the difference between attached and unattached work orders
- Creating a basic work order—add labor, material, and equipment
- Creating child work orders associated to a parent work order
- Setting up cyclical work orders and preventive maintenance schedules (duration or metric driven)
- Associating work orders and service/work requests so that related information is carried over and the records are closed in one step
- Understanding how inspections work and the parameters involved to create them
- Security domains/organizations, user groups, and permissions

Day 3

- Learn how mobile and field software versions run on mobile devices and smartphones as it relates to display, work efficiency, etc.
- Examine network connectivity requirements and other requirements of each mobile and field version.
- Work with different maps both in online and offline situations.
- Understand browser specifications for each mobile and field option.
- Find out configuration requirements that must be performed prior to working with the mobile and field options.

Review best practices when working with data both in the office and in the field.

At the conclusion of core team training, the project team should be familiar with the selected EAM product, base functionality and capabilities. The team is not expected nor required to be system experts at the end of training, but instead to have achieved a level of familiarity with the product in order to make informed decisions during subsequent configuration tasks. When training is completed, the installed environments will remain available for further testing and use as a City and project "sandbox" during configuration in the development/test environment. However, as configuration nears completion, the production environment will be overwritten to support install and configuration for the "live" system. Please note that it is assumed that all service requests, work orders, or inspections created during training and during all configuration phases prior to go live will be deleted and a fresh production database will be used when the EAM goes live for the first time.

Task 3.3 System Configuration

Black & Veatch will follow an iterative configuration process that is based on analyzing and identifying a subset of requirements that were presented in the Task 2.3 Configuration Planning phase, configuring the system to support that subset of requirements, reviewing with City staff in a workshop setting, adjusting the configuration based on feedback from the workshop, and then repeating the process all over again. This "learn a little, build a little, review, adjust and repeat" process ensures that City staff will be engaged throughout the configuration of the system. It facilitates knowledge transfer and better prepares your staff to take ownership of the system administration and management duties following go-live. This iterative process allows for frequent and consistent City participation and feedback with all implementation groups, resulting in incremental changes during configuration and preventing misunderstandings in how the system will function and be configured for the City.

Each iteration will involve on-site time to review and analyze processes followed by off-site activities to configure the reviewed processes. Particular focus will be on the application of the system's mobile capabilities in order to foster an efficient, paperless work environment for maintenance personnel. The configuration will then be reviewed with staff via an on-site workshop whereby staff feedback will then be coordinated into the configuration based on that review. Following the workshop, subsequent processes and requirements will then be reviewed to re-start the process.

Black & Veatch will provide up to three iterations of the configuration cycle to complete the full implementation for each implementation group.

However, it is expected that the iteration cycles will become more efficient with each successive implementation group.

Task 3.3.1 PlantWorks

Black & Veatch has drawn from our 100 years of experience in engineering water and wastewater treatment plants to develop a custom tool, PlantWorks, which sits on top of Cityworks. This tool is targeted

specifically at quickly locating non-spatial or "vertical" assets found inside of water and wastewater treatment facilities, pump stations, lift stations, and indoor environments. This tool allows users to quickly view and access the asset hierarchy to find and select an asset that is not mapped (i.e. an ESRI Object Class). Users do not need to know specific asset identifiers but rather they can scan the asset hierarchy to find a specific asset they wish to know more about, create a work order or inspection record for, or swap out with a replacement asset.

To facilitate this tool during the Phase 1 implementation for pump stations, Black & Veatch will review the departments' existing geodatabase structure and existing asset data to provide recommendations that support the implementation of Cityworks and ensure the asset management goals of the treatment pump stations can be met. This will be facilitated in a geodatabase design workshop. It is assumed, for scope and budget purposes, that the two water treatment facilities pump stations



PlantWorks

assets for both water and sewer are similar and will use the same geodatabase design. Workshop recommendations may include adding fields, creating new object or feature classes, combining object or feature classes, creating relationship classes to support asset hierarchy needs. Once recommendations have been agreed upon, Black & Veatch's team of GIS experts will assist with the updates. Black & Veatch will use asset data provided by the City and will not perform any asset data collection or inventory.

Task 3.4 Reporting & Dashboarding

Reporting. As part of the configuration process, an understanding of the information that is expected to be reported out of the system is needed. To start this process, the project team will review existing reports used by the City related to asset/work management and the major maintenance program and document their requirements. In addition to reviewing existing reports, workshops will be held to determine if there are additional reports needed that were not available in previous

systems. These requirements will be used to compare to the more than 200 standard reports that Cityworks offers its users free of charge. Our goal is to limit custom reporting and maximize the usage of standard reporting the information gathered from this process will not only be used to create a Reporting Requirements and Design Document, but will also be used to build upon the list of configuration requirements included in the configuration plan.

Each report within the requirements document will be ranked by priority. This ranking will be used during the report creation task for prioritizing which order reports are created in. For purposes of preparing a cost proposal, Black & Veatch has allocated 80 hours of report configuration and development support during implementation.

- Dashboarding. Black & Veatch has extensive experience in developing dashboards and KPIs in support of our clients' asset and maintenance management programs. Through this experience, our team has adopted the philosophy that effective dashboard and KPI development is founded on six guiding principles:
- Understand the Audience. The most effective dashboards target a single type of user and just display data specific to that "use case."
- Use Correct Dashboard Type (Operational, Strategic/Executive, or Analytical). Operational dashboards display data that facilitate the operational side of a business. Strategic dashboards will typically provide the KPIs (Key Performance Indicators) that an organization's executive team tracks on a periodic basis. An Analytical dashboard could display operational or strategic data. However, this type of dashboard will offer drill-down functionality allowing the user to explore more of the data and get different insights.
 - *Group Data Logically.* A well-designed dashboard will ensure that data is displayed in logical groups. For example, if a dashboard includes Financial KPIs and Maintenance Schedule Compliance, ensure that the financial data is displayed next to each other.
 - Make Data Relevant to Audience. An Executive dashboard can have a number of different audiences. Ensure that the data displayed is relevant to the users. Consider the scope and reach of the data when designing the dashboard.
- Present Most Important Metrics Only. Cluttered displays deflect the focus from the important messages. Some are cluttered with useful and relevant information and some are cluttered with useless and irrelevant information. Neither of these situations is desirable.
- Understand Required Refresh Frequency. Refreshing the dashboard data at the right intervals saves time during development and can drive optimal performance once the dashboard is live.

Black & Veatch will facilitate a series of workshops during the latter stages of the system configuration task to identify dashboard and KPI requirements. These will be documented and prioritized in a Dashboard and KPIs Requirements document. To facilitate development of the critical dashboards and indicators, Black & Veatch has allocated 80 hours of custom dashboard and KPI development support for this task during implementation

Task 3.5 Acceptance Testing

Upon completion of configuration, data migration, and system integration development, Black & Veatch will conduct system acceptance testing to ensure that Cityworks has been implemented per the configuration, migration, and integration decisions made throughout the project. Prior to the commencement of testing, a Testing and Acceptance document will be prepared that identifies the specific scenarios to be tested. Scenarios will include all configured modules, processes that require integration with other City systems in order to adequately test the functionality of the developed integrations, and the review of historical data migrated into the system as well.

Acceptance testing will take place on-site at City facilities over a one-week period. Testing will be facilitated by Black & Veatch personnel; however, will be completed by City staff (core team). Any scenarios that failed will either be addressed during the testing week and re-tested, or addressed and then retested at a later date.

Task 3 Deliverables

- Installation of development, test/train, and production Cityworks environments
- Core team training for end users
- Core team training for administrators
- Draft and Final Configuration Plan documents in MS Word format and MS Excel spreadsheet where applicable
- Cityworks Configuration for each implementation group
- PlantWorks configured for use with City pump station facilities
- PlantWorks installation guides and support
- Geodatabase Design workshop for pump station facilities
- Draft and final geodatabase for pump station facilities
- Report requirements document draft and final
- 80 total hours of report configuration
- Dashboard and KPI requirements document draft and final

- 80 total hours of custom dashboard and KPI development support
- Test document for configuration testing
- Assistance to City staff during acceptance testing

Assumptions:

- City will purchase appropriate licenses of Cityworks , Assetic and other required software proposed in this submittal to support project requirements
- City will provide appropriate remote access (VPN, guest user logins with required permission levels, appropriate security privileges to adequately configure, load data, test, and use system, etc.) for remote configuration to occur.
- City will provide all necessary hardware to support the implementation and deployment of Cityworks.
- City will establish Development, Test, Training and Production environments for use during Cityworks configuration efforts and for future system administration and management
- City will be responsible for determining accuracy of data and performing any required data cleanup efforts prior to migration
- City will provide access to development and test environments of any information systems to be integrated with Cityworks for purposes of integration development and testing
- The Black & Veatch team will only use asset data provided to our team from the City. The Black & Veatch team will not perform field data collection.

Task 4 Integration and Interface Development

Task 4.1 Systems Integration

The City has identified requirements to develop integrations between Cityworks and other key information systems such as its impending Lawson ERP solution, its citizen engagement platform, Qcsend, the Cayenta Utility Billing system, Laserfiche and a number of reporting platforms. Additionally, Black & Veatch anticipates that the City will desire additional integrations to facilitate the exchange of information for the City's representative water, sewer, and stormwater models in support of the City's asset management vision. This will allow for more accurate tracking of maintenance and asset lifecycle costs, enabling the City to make more informed decisions regarding rehabilitation or replacement of assets. In addition, creating integrations between systems will reduce the likelihood of human error and provide efficiency improvements.

There are a wide range of possible points of integration between Cityworks and other City information systems, including:

- Lawson ERP items like employee and labor rate are often housed with financial systems. Keeping employee information up to date along with their associated labor rates is important to support accurate labor cost accounting for maintenance activities against infrastructure assets. This is an example of the integration value with the ERP.
- Laserfiche Enterprise Content Management content management for records storage, invoicing, and may have specific workflows configured within the Laserfiche system. There is tremendous value integrating content management for document records, contractor invoices for work packages, and providing access to engineering records like scanned drawings. Due to the funding available in Phase 1 it is anticipated that integration with Laserfiche will not be completed in Phase 1.
- Cayenta Utility Billing houses payment and consumption history for metered users. There is immense value in linking customer call history, utility billing complaints, new service requests, and many other requests to the Cityworks system. It helps to streamline business processes and increase customer satisfaction.
- Parts/Materials Inventories. Integration with the financial management system, to facilitate accurate materials and parts cost information associated to maintenance activities performed in Cityworks, will result in better maintenance cost tracking and overall management of inventory.
- Innovyze (InfoWater the City's water and sewer model InfoMaster, and InfoSewer) models results for the water and sewer models, and for Cityworks to develop and prioritize and package rehabilitation, renewal, and replacement projects. Black & Veatch has extensive in-house expertise with the Innovyze suite of tools, and these staff will work closely with our Cityworks implementation team.
- ICPR4. The City's stormwater master plan model. Black & Veatch understands that the City may want to develop data import and export routines from the EAM system for use within modeling software such as ICPR4. We will coordinate with Streamline Technologies, the developer of the Interconnected Channel and Pond Routing Model (ICPR4) to develop a data exchange framework between ICPR4 and Cityworks.
- Assetic Predictor is the proposed asset management lifecycle modeling software. Black & Veatch has teamed with Assetic, who has worked with ESRI and Cityworks, to provide asset management analytics for the GIS centric organization. Life-cycle modeling is offered through a partnership with Assetic and their software solution, Predictor. This platform consolidates asset information across an organization and produces an asset data warehouse that integrates with Cityworks and the ESRI ArcGIS



CAM #18-0085 Exhibit 3 70 of 173 Cityworks will almost assuredly require integration with the City's impending Lawson ERP solution. Black & Veatch has included CH2M as part of our Team to leverage their specific integration experience with Cityworks, Lawson, and the Cayenta Utility Billing solution.

Assetic will be used to integrate Assetic Predictor with Cityworks and ESRI for advanced asset management analysis. platform. Business rules are developed to track and manage assets applying life-cycle decision-tree analyses. The system is designed to provide tools that promote long term sustainability of assets (linear and vertical) using funding models, asset condition life-cycle risks and priorities. As a strategic asset management tool, Assetic Predictor delivers the ability to develop a long-term outlook (5 to 100 years), illustrate various cost and service level scenarios and the impact to the assets over time, and produce a capital investment plan (CIP) for all departments in your organization Black & Veatch have proposed one (1) initial license and deployment for one (1) implementation group. Additional licenses will be required to deploy to other implementation groups. Black & Veatch and the City will jointly determine the implementation group to deploy to.

Because Cityworks will almost assuredly require integration with the City's impending Lawson ERP solution, Black & Veatch has included *CH2M* as part of our Team to leverage their specific integration experience with Cityworks, Lawson, and the Cayenta Utility Billing solution.

Black & Veatch will also coordinate with Streamline Technologies, the developer of ICPR4 (the City's stormwater management model), and Innovyze, the developer of InfoWater (the City's water and sewer model), to allow for data transfer between the models and Cityworks. In addition, Assetic will be used to integrate Assetic Predictor with Cityworks and ESRI. The coordination with the City's current stormwater and water/sewer models, together with the implementation of Assetic, will provide the City with increased used of its current available data, enhancing its asset management capabilities.

There is a variety of information that will require definition for the integration identified during system configuration. To develop this information, Black & Veatch will facilitate three days of on-site integration workshops to work with the appropriate City staff to identify the following:

- Best source (system) for desired information
- Type of integration required (read-only, read/write)
- Frequency of data updates (real-time, daily, weekly, annually)
- Available integration methods (extract-transact-load, database level integration, existing application programming interfaces [APIs], or web service frameworks)
- Potential transactions and specific information that will be required for each transaction

This information will be captured in an EAM Systems Integration technical memorandum and provided to the City for review and comment. The specific systems, data that will need to be shared, and integration methods are not currently defined at this time. Therefore, Black & Veatch has allocated an as-needed allowance for systems integration design and development support, as outlined in the deliverables.

Task 4 Deliverables

Integration plans and completed integrations per plans for:

- Cayenta Utility Billing
- Infor/Lawson ERP plans to finalized based on ERP implementation plan
- Innovyze (InfoMaster, InfoWater, InfoSewer)
- Asset Predictor presented as optional on Fee schedule

Assumptions:

- The specific systems, data that will need to be shared, and integration methods are not currently defined at this time. Therefore, Black & Veatch has allocated an as-needed allowance for systems integration design and development support, as outlined in the fee schedule.
- Integration with Lawson will occur in a later phase after implementation of Lawson ERP.

Task 5 Data Conversion

The City has invested heavily in its GIS program and maintains a significant GIS asset repository. It is also conceivable that additional asset data and maintenance history information will be available within other legacy information systems such as local databases and spreadsheets or legacy work management solutions that may be in use at treatment facilities. Upon request from the City, Black & Veatch will assess this data to determine the feasibility to migrate this data, conceptual data mapping required to convert the data, and QA/QC workflow processes. Black & Veatch has completed hundreds of data conversion efforts, and has proven and efficient processes for data conversion whether it be paper to GIS, CADD to GIS, or translation from an independent system.

During Task 2, Black & Veatch will work with the City to also identify possible asset and maintenance history data sources that may require migration. During this task, Black & Veatch will develop a Data Migration Specification that identifies data sources, data types, source location, and destination location for reach record type and field to be migrated to Cityworks. Each piece of information to be migrated will be identified with a source system of record in order to address any conflicts or inconsistencies with the data.
Following review and acceptance of the migration specification, Black & Veatch will conduct a test migration of the data into the Cityworks development/test environment. Once migrated, this data will be reviewed by department staff for acceptance. A final migration will be completed prior to go-live. Black & Veatch has allocated an as-needed allowance for data migration specification development and migration support, as outlined in the deliverables below and within Section 4.

Black & Veatch understands that the City, like many others, have invested heavily in a variety of data sources. To bring the best value and maximize the use of the City's current data, *we have teamed with several local firms who possess expertise with data repositories. These include:*

- **RADISE International**, has experience with GIS database management.
- **Tobon Engineering,** who's President, Maurice Tobon, has specific experience working with the City's water and wastewater models during his time as an employee of the City of Fort Lauderdale.

Task 5 Deliverables

Up to 200 hours of reserved data conversion time to be used at client discretion.

Task 6 End User Training and Support

Prior to system go-live, both system administrators and end-users will require training. Black & Veatch will develop a training curriculum specific to the City user groups and will provide a train the trainer for City training staff. Similar to the core team administrator training provide as part of Task 2, Black & Veatch will provide administrator training again prior to go-live. During this round of training, we will use all City-based configurations, data and workflows for administration training, but will follow the same threeday training format.

For the train-the-trainer end-user training, Black & Veatch will develop customized, role-based training for each defined user role, and will walk the City-appointed trainers through a typical training class. Additionally, Black & Veatch will provide onsite training assistance for the first few classes to help City staff get comfortable with training and assist with answering questions that may arise. The following table indicates the typical types of training classes and numbers of users that will require training prior to go-live.

CLASS NAME	USER TYPE	ANTICIPATED USERS PER CLASS	DURATION (DAYS)
Cityworks System Administration	System Administrators	up to 5	3
Asset Administration and Management	Asset Management Personnel, Maintenance Managers/ Superintendents	up to 7	1
Advanced Work/Service Requests and Work Orders	Supervisors, Maintenance Managers/ Superintendents, Management	up to 10	2
Basic Work/Service Requests and Work Orders	Maintenance Technicians, Crew Leads, Maintenance Personnel	up to 12	1
Mobile Access	Maintenance personnel utilizing mobile applications	up to 12	1/2

Each training class will include training materials specific to the City's EAM solution implementation and associated work processes and will be conducted at City facilities.

Task 6.1 Go-Live Support

When end-users begin to use the EAM as part of their daily activities, Black & Veatch will provide on-site go-live support to respond quickly to any issues that may arise. Initial go-live of a new system can be stressful and can tax an organization's normal support infrastructure. Augmenting City staff with Black & Veatch experts during initial system cutover will help with City staff adapt to the new system and minimizing any drop in efficiency. Embedding support staff in the field with users helps issues to be more quickly identified, verified and addressed.



Customized Training Materials using City Data and City Workflows BSI Standards Publicatio

BS ISO 55000:2014

BS 150 55002:2014

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Asset management

Asset management

85 150 55001 2014

Asset management

Task 6 Deliverables

- Customized end-user training guide in PDF and MS Word format
- Administrator training guide in PDF and MS Word format
 - Train-the-trainer instruction for up to 5 City appointed trainers
 - 3 days of system administrator training
 - 24 hours of go live support for each implementation group

ASSET MANAGEMENT-DRIVEN APPROACH

It is Black & Veatch's belief that any Enterprise Asset Management System implementation is best supported with an asset management framework. *Our staff's expertise as Institute of Asset Management endorsed Assessors and our practical approach to asset management will provide comprehensive value to the City.*

We are proposing an optional asset management framework development phase in conjunction with the Cityworks implementation. Why? Because for the extra effort invested in this framework we believe that the City will receive additional benefits of increased transparency of capital planning, prioritization of spending across assets using an asset management driven approach, increases in operational efficiency, and an asset management improvement roadmap to name a few. Given the level of involvement, this effort may be more suited for a later phase of implementation, but we feel it is important to introduce the concept here and recommend the consideration.

OPTIONAL CONSIDERATIONS – ASSET MANAGEMENT GAP ASSESSMENT

The City is embarking on a significant change in the way it manages asset and maintenance activities with the implementation of the Cityworks EAMS. This a great step forward in achieving its asset management goals. However, we also believe that defining a strategic asset management vision is a key to long-term success with effective asset management. An EAM software solution is not the only component of an asset management program. An EAM is a critical tool, but there are other components to take into consideration. Black & Veatch recommends that the City consider our approach below as an accompaniment to developing its overall asset management program. *We possess extensive experience devising the right level of detail for each client. As we understand that ISO certification is not a goal for all clients, the ISO 55000 format provides a valuable baseline and guide to the development of a formalized asset*



As an Institute of Asset Management **Endorsed Assessor**, the City can be certain we can successfully implement its Asset Management Program.

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management program. As a member of the Institute of Asset Management (IAM) Black & Veatch is an Endorsed Assessor for the PAS 55 and ISO 55001 asset management standards. We were among the first organizations to be appointed by the IAM as Endorsed Assessors. By qualifying for this endorsement, Black & Veatch has demonstrated a commitment to the PAS 55 standards and a sufficient level of rigor and impartiality in our approach to this work, and Black & Veatch is bound by the IAM Code of Conduct. Individual Endorsed Assessors must demonstrate an in-depth knowledge of PAS 55 and ISO 55001, have over 5 years senior asset management experience, and must pass the IAM's Certificate in Asset Management. Black & Veatch only uses its individual Endorsed Assessors to undertake PAS 55 or ISO 55001 gap assessments.

Black & Veatch offers deep experience and a focus on asset management strategy and processes, combined with technical engineering and understanding of electric, water, oil and gas infrastructure. Black & Veatch is a leader that helps utilities enhance their asset management programs, using industry best practices as a foundation.

We use a 2-phase approach for PAS 55 and ISO 55001 assessments: Phase 1 Gap Analysis and Phase 2 Improvement Roadmap Development. Phase 1 consists of the documentation review, interviews and meetings, and the gap analysis. Phase 2 consists of the development of improvement initiatives based on the results of the gap analysis, and road-mapping workshops to review the initiatives and develop an improvement roadmap.

Black & Veatch has used this approach successfully on a number of PAS 55 and ISO 55001 assessment projects. The assessment includes a document review, and individual and group interviews using a structured set of questions. Gaps are assessed for each PAS 55 or ISO 55001 element, with each element scored from 0 to 4, where a score of 3 demonstrates compliance with PAS 55/ISO 55001. Results are presented in a radar plot. Black & Veatch's experience of over 100 years in the Energy and Water industries provides the City with deep asset management expertise developed from our leadership in the Energy industry and technical understanding of the electric, water, oil and gas infrastructure.



For each of the key gaps identified we recommend improvements that are incorporated into specific initiatives, which form the Asset Management Improvement Roadmap. This includes an action plan and schedule for implementing the improvements.

Black & Veatch also provides implementation support services, including:

- Development of asset management policy, strategy and objectives
- Business process improvement
- Risk management and capital prioritization
- Asset management plan development
- Training and coaching

Black & Veatch recommends that the City consider developing or reviewing its asset management framework as part of this project but for the sake of budget and scope we have not built in cost or schedule impacts. However, it is not anticipated to impact the overall project schedule.

IMPLEMENTATION SCHEDULE

Black & Veatch has reviewed the proposed timeline provided in the RFP. With input from the City we will be able to meet the timeline as indicated in our proposed schedule below. *The proposed implementation schedule has an estimated duration of three years for Phases 1 and 2. The estimated duration of Phase 1 is 15 months.* We believe this is a reasonable timeline; however, Black & Veatch will be open to shifting priorities to accommodate the City's changing needs.

We understand the City's need to demonstrate continual progress. We have several options that we can consider to facilitate different levels of progress. One of our primary goals is to balance the short-term needs of the City to implement a proven EAM system with the long-term goal of providing a sustainable solution that can benefit the City across all its departments.

The scheduled work plan will prioritize the implementation order for each department. Currently, it is understood that the following groups will be implemented:

- Stormwater Collection
- Water Distribution
- Wastewater Collection
- Two Water Treatment Facility
- One Wastewater Treatment Facility

Black & Veatch's implementation experience suggests that a phased approach is recommended for the City to efficiently implement the EAM system. To that end, we have divided the implementation into two distinct phases: *Phase 1 will include linear systems implementation (stormwater, water distribution and sewer collection including pump stations and storage tanks – per answer 38 of Q&A); and Phase 2 will include facilities (water and wastewater treatment –to be performed as a future phase per answer 38 of Q&A).* Our schedule takes into account one time activities such as core software installation into Phase 1 only.

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CURRENT WORKLOAD AND STAFF AVAILABILITY

Black & Veatch fully understands staffing requirements for master planning projects and General Engineering Consulting contracts. *We have the personnel depth to increase staffing if schedule is a concern.* We are diligent about managing workload and anticipating the level of effort so we can make the resources available when they are needed.

Black & Veatch is committed to providing the key staff identified in this proposal as well as other local, regional, national and international technical resources required to successfully complete any tasks assigned by the City. Based upon our current level of commitment and the recent and upcoming completion of several projects, Black & Veatch has sufficient available capacity to complete this contract. Our current and anticipated workload will not impact in any way our ability to perform under this contract and successfully deliver the implementation of an EAM system for the City. In fact, we look forward to bring the lessons learned from our multiple EAM related projects.

A summary of current projects and anticipated workload for specific understanding of our availability to work under this contract is provided on the following page.

Summary of Current Projects

Black & Veatch's Water division alone is currently performing more than 140 projects with revenue of greater than \$1 million each, and more than 1,000 smaller contracts. *Following is a summary of select projects that involve our proposed team members.*

	PERCENT COMPLETE	PENDING START DATE	ESTIMATED END DATE	TEAM MEMBER INVOLVEMENT
JEA, FL Cityworks Phase 2 (TP)	0%	08/01/17	09/30/18	Mark, Matt, Traci, Joe, Bryan
Mesa, AZ Cityworks WWTP Plant	5%	06/15/17	12/30/17	Mark, Matt, Traci, Joe, Bryan
Charlotte DOT, NC Cityworks Implementation	20%	Ongoing	12/30/18	Mark, Matt, Traci, Joe, Bryan, Kelli
Charlotte Solid Waste, NC Cityworks Support	0%	06/01/17	05/30/18	Mark, Matt, Traci, Joe, Bryan
Port of San Diego, CA EAMS Support	30%	Ongoing	12/30/17	Mark, Matt, Traci, Bryan, Amanda
Salt Lake City, UT Cityworks WWTP	40%	Ongoing	12/30/17	Mark, Matt, Traci, Joe, Bryan, Kelli
Greenville, SC Cityworks Training	90%	Ongoing	06/30/17	Mark, Matt, Traci
Rock Hill, SC Citizen Engagement Portal	0%	07/01/17	10/30/17	Mark, Matt
San Diego County, CA Cityworks Implementation	10%	07/01/17	06/30/18	Mark, Matt, Bryan
Gwinnett County, GA Maximo Support	0%	06/01/17	10/01/17	Mark, Matt, Joe
HRSD AM Program/InforEAM Support	25%	Ongoing	09/30/17	Matt, Bryan

Anticipated Workload

The workload of the individual team members has been analyzed, and it has been determined that team members will have at a minimum 30% availability throughout the implementation efforts, and some members will have full availability immediately upon a notice to proceed. At appropriate times, selected members will have 100% availability to complete their portion of the project. All professionals have personally confirmed that they are prepared to devote the time necessary to perform the project work on schedule and budget and are committed to successful delivery. *Many of our team members have recently completed very similar projects for major public utilities, allowing them to provide proven solutions to the City.*

		20	18			20)19		2020				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Rafael Frias	10	10	10	10	10	10	10	10	10	10	10	10	
Mark Seastead	50	50	50	50	50	50	50	50	50	50	50	50	
Bryan Dickerson	10	10	10	10	10	10	10	10	10	10	10	10	
Ricardo Vieira	10	10	10	10	10	10	10	10	10	10	10	10	
Walt Schwarz	25	25	25	25	25	25	25	25	25	25	25	25	
Amanda Schwerman	20	20	20	20	20	20	20	20	20	20	20	20	
Maurice Tobon	15	15	15	15	15	15	15	15	15	15	15	15	
Blake Guillory	30	30	30	30	30	30	30	30	30	30	30	30	
Matt Morey	50	50	50	50	50	50	50	50	50	50	50	50	
Joe North	25	25	25	25	60	60	60	60	60	60	60	60	
Traci Berlingieri	20	50	50	75	100	100	100	100	100	100	100	100	
Andrew Hu	25	25	25	25	25	25	25	25	25	25	25	25	
Jeff Brill	25	25	50	50	50	25	25	50	50	50	50	25	
Joshua Truong	25	25	25	25	25	25	25	25	25	25	25	25	
Courtney Kennedy	25	25	50	50	100	25	25	25	25	25	25	25	
Jacob Peck	25	25	100	100	100	25	25	25	25	25	25	25	
Shelley Hill	25	50	50	50	50	50	50	50	50	50	50	50	
David Schobelock	20	20	20	20	20	20	20	20	20	20	20	20	
Sandeep Jadala	20	20	100	100	100	50	50	50	50	50	50	50	

Availability

Availability Workload

References

Cityworks Implementation 2017

Jackson Energy Authority

Eddie O'Neill, PE W/WW Operations Manager 250 N. Highland Ave., Jackson, TN 38301 731-422-7214 eoneill@jaxenergy.com Cityworks EAMS implementation for water/wastewater systems. Core implementation and integration with CRM/Utility Billing systems. Phase 2 efforts will include implementation in 4 treatment plants.

Total Cost: (\$120,000)

Cityworks SLCWRF Phase 2 (Ongoing)

Salt Lake City

Giles Dempke, PE WW Engineer 1365 W 2300 N Salt lake City, UT 84116 801-799-4080 giles.demke@slcgov.com Cityworks EAMS implementation for 64 MGD water reclamation facility, full asset inventory and mapping of maintenance business processes.

Upgrade of Cityworks to AMS Server 2015. Implementation of fire

implementation for over 100 city owned buildings.

hydrant inspection application for Cityworks. Facilities Management

Total Cost: (\$600,000/\$650,000)

Cityworks Upgrade and Support 2016

City of Rock Hill

Shawn Carson GIS Manager 757 S Anderson Rd Rock Hill, SC 29731 803-329-8723 Shawn.carson@cityofrockhill.com

Total Cost: (\$25,000)

Cityworks Support 2016

Charlotte Area Transportation

Services (CATS) April Johnson Cityworks Administrator 901 N Davidson St, Charlotte, NC 28206 704-432-3548 ajohnson@ci.charlotte.nc.us Implementation of Cityworks EAMS for facilities for CATS. Required as part of Federal Highway Administration, Moving Ahead for Progress in the21st Century (MAP-21) (P.L. 112-141) program. Implementation of physical asset management system for over 75 users.

Total Cost: (\$35,000)

Cityworks Migration Project (Ongoing)

Charlotte, Department of

Transportation Charles Jones, PE Administrative Manager, Street Maintenance Division 4147 North Pointe Industrial Blvd, Charlotte, NC 28216 704-336-8334 cljones@ci.charlotte.nc.us Migration of Hansen to Cityworks. Included integrations with City's CRM, deployment to over 200 field users, mobile configuration, reporting, administrator training, end user training and support.

Total Cost: (\$800,000)

Minority/Women (M/WBE) Participation and Subconsultants

Black & Veatch has a keen interest in the communities where it performs work and, specifically, in helping to build small and minority businesses because we know local businesses provide local job opportunities. *Our local C/SBE and C/MBE subconsultant firms, Tobon Engineering and RADISE International, have served the Broward County community over the years as providing expertise in the areas of water and wastewater systems models and GIS, database and IT management.*

Black & Veatch is firmly committed to equal opportunity, and we have a strong record of utilizing disadvantaged minority-owned or womanowned business enterprise (MBE/WBE/DBE) subconsultants in support of the community and our clients' programs.

CH2M

Founded in 1946 as a 4-man firm, CH2M has grown to a global company with employees in offices worldwide. However, we have built our reputation on providing responsive service and cutting edge expertise to our clients. Our presence in the Enterprise Asset Management practice includes over 100 professionals skilled in a variety of focus areas, including extensive experience integrating enterprise systems.

The CH2M enterprise is built on honesty, ethics, and morals. In fact, we have just been named one of the World's Most Ethical Companies for 2016. In 2015, CH2M also was awarded the distinction of being named a

Top 50 Employer in 2015 by Minority Engineer magazine, as well as a World's Most Admired Company (for the ninth time) by Fortune magazine.

Unparalleled Technology Application Expertise

CH2M has provided leadership both globally and domestically in utility management in variety of areas, including asset management, maintenance management, and financial management. Our work has included not only development and enhancement of software tools such as Computerized Maintenance Management Systems (CMMS), Geographical Information Systems (GIS) and Closed-Circuit Television (CCTV) software, but also asset management programs and performance metrics that highlights industry best practices. CH2M has developed or participated in the development and application of a variety of work management and asset management tools internationally and nationally.

CH2M offers the City subject matter experts and former utility managers with first-hand experience transforming their organizations. Our industry thought leaders are recognized for their authorship of management publications and for guiding utilities across the globe to become more effective and efficient in service delivery. Black & Veatch has a strong track record of supporting community development and local economies by leveraging the services of highly qualified small businesses and disadvantaged minority and womanowned businesses in meaningful roles on our projects. For example, under a recent continuing services contract for Hillsborough County, we subcontracted with 10 different DM/DWBE companies who supported the following service areas:

- Structural engineering
- HVAC engineering
- Architectural design
- Geotechnical investigation
- Surveying
- Underground utility locations
- Construction Inspection
- Environmental/wetlands permitting
- Hazardous materials testing
- Instrumentation & controls

Sustaining a best-in-class performance requires continuous improvement to meet and manage the ever-changing business environment. *CH2M has completed more than 200 CMMS enhancement and implementation projects throughout Canada and North America. Specific skills and experiences CH2M has gained on these projects that will directly benefit the City of Fort Lauderdale include the following:*

- Largest Cityworks platinum partner, CH2M has had significant experience with City-wide and complex CMMS implementation, integrations, enhancements and workflow improvements. CH2M's Cityworks Implementers from around the nation exchange and share resources and information on challenges and successes.
- Strong portfolio of CMMS Implementation. CH2M is the leader in multiphase projects and can develop "right-sized" solutions to any client's needs. Our approach to implementation is based on providing the expertise and framework for success, while recognizing that sustainable implementation requires knowledge transfer and staff-driven change.
- A leader in Utility Performance Measurement services, CH2M offers City of Fort Lauderdale expertise in implementing Key Performance Indicators (KPIs) through Cityworks to provide the necessary data, data analysis and reporting to easily and effectively provide KPI information to City of Fort Lauderdale staff.
- With ESRI GIS being the foundation on which Cityworks runs, *CH2M is an ESRI Silver partner*, highly experienced in making GIS and Cityworks fully integrated and maximizing the use of these tools in the field and the office.
- Experienced in providing *effective training for all-levels of staff* on the use of Cityworks to ensure the enhanced use of Cityworks is documented for future users.
- Highly knowledgeable of the International Organization for Standardization (ISO) Standard 55000. CH2M was involved in the development of ISO 55000, the international standard for asset management, released in January 2014. Our staff participated in this multi-year effort to create this international framework that is being used by organizations worldwide. Portions of this framework are focused on documenting workflow procedures and the development and use of performance measure for an organization.
- Industry leader in software integrations, CH2M has accomplished the most complex of Cityworks integrations with other software systems to meet client needs, improve efficiencies, save money, and enhance the value and functionality of agency GIS and CMMS technology.
- Superior knowledge of Cityworks tools and functionality, CH2M Cityworks Implementers have in-depth knowledge and experience with

all the tools Cityworks has to offer as well as the variety of mobile applications, 3rd party offerings and integrations.

Advanced skill in Cityworks form customizations, CH2M's xml editing expertise enables quality customization of the Cityworks user interface at an extreme value.

In summary, *CH2M will assist the City with implementing the EAM system with the end-users in mind by leveraging its condition assessment experience with the City's water and wastewater infrastructure.* Their unique combination of local knowledge and commitment, access to national resources and experience, first-hand field implementation experience, demonstrated Cityworks experience, and state-of-the-art technology assures the City successful streamlining of workflow and procedures associated with CMMS.

RADISE INTERNATIONAL

RADISE International (RADISE) solves the Infra-structural and Software Development challenges faced by its diverse client base. A clear focus on being on time, on budget and on target has helped us grow since our inception in 1997.

RADISE has provided staff augmentation, IT consulting and software consulting services for several government and private clients. Its clients include:

- Counties (Palm Beach, Broward, Dade and Hillsborough)
- Cities (Miami, Coral Springs, West Palm Beach, Boca Raton and Jupiter)
- State of Florida
- South Florida Water Management District
- Florida DOT
- School Boards (Palm Beach County, Broward County and Hillsborough County)
- Broward County Sheriff's Office
- Broward County Aviation Department
- Various Private Clients

Additionally, our commitment to teamwork has led to successful partnerships in the past with Prime Consultants including PBS&J, Radiant, IBM, Synova, TekPartners, and NuInfo.

RADISE Staffing Services division has a team of dedicated and highly experienced Account Managers for its Software Division. All Technical Recruiters are Computer Science Graduates or possess equivalent experience obtained through training that brings both a thorough understanding of technology as well as a keen understanding of human behavior in a technology context. *Our highly skilled developers and analysts are available for deployment within client projects, enabling the clients to fulfill their needs for specific periods of time.* Personnel at various levels of expertise are available, enabling the client to quickly staff up in-house projects. We also provide technical personnel on a contractual basis to address specific projects and needs. These professionals are RADISE employees and contracted on an assignment basis.

RADISE takes up challenging and exciting client engagements and has an organizational culture that emphasizes learning. This drives every employee to excel in their individual capacities and as team players. Each client engagement provides unique opportunities to innovate and excel in technology and project management.

TOBON ENGINEERING

Tobon Engineering is a minority owned engineering consulting business founded by Mauricio Tobon, PE, a Professional Engineer with over 27 years of experience in water, wastewater engineering, master planning, hydraulic modeling, and climate change in south Florida and internationally.

The owner and President of Tobon Engineering, Maurice Tobon, served for fifteen years at the highest management levels of two of the largest water utilities in south Florida (Palm Beach County and City of Fort Lauderdale) and was responsible for nearly \$ 1 billion in capital improvements. His experience also consists of construction management, contract claims review, and contract negotiations. Mr. Tobon has unique experience and insight from many years in government and understands the issues faced by water utilities.

Company Strategy

- Purpose: To be a leader in the water engineering and climate change consulting industries by providing experienced technical services.
- Vision: To provide quality services that exceeds the expectations of our clients.
- Mission statement: To build long term relationships with our customers and clients and provide exceptional customer services by pursuing business through understanding the issues faced by water utilities.
- Core values: We believe in treating our customers with respect by integrating honesty, integrity, and ethics into all aspects of our business.

Goals

Regional and international expansion in the fields of water engineering, hydraulic modeling, utilities management and climate change, develop a strong base of key clients.

FORM 3 - FUNCTIONAL REQUIREMENTS

INSTRUCTIONS FOR COMPLETING FUNCTIONAL REQUIREMENTS

1) Proposer Response

For each numbered line item requirement, the Proposer must indicate Y, 3P, C, F, or N with an "X" in the Vendor Response column, according to the following legend:

Y	Fully supported by the current release of the software.
3P	Supported with third party software (i.e. software not directly owned or controlled by the
	Proposer submitting the proposal).
С	Customization is required to meet the requirement (e.g. changes to the underlying code must be made; a new table must be created; etc.) This causes additional upgrade work in order to implement new versions or upgrades.
F	Future functionality: Supported in the next release of the software.
Ν	Not supported.

- If the Proposer responds with 3P, C, or F, the Proposer <u>must</u> provide additional information in the comments column:
 - For "**3P**", the Proposer must explain what third party software application or service is required, any integration requirements, and the Proposer's relationship with this third party.
 - For "C", the Proposer must explain the nature and amount of customization required, and experience with the same or similar modifications.
 - For "F", the Proposer must explain the functionality in the new release, the expected general availability release timing and provide surety that the functionality will be included.
- 3) The Proposer must also identify which module(s) the required functionality is part of in the final column (as applicable).

The information must be completed and submitted in the format provided. We must be fully provided with all associated software, modules, equipment, and technology platforms, and any other information that is required to obtain a fully functioning system. It is must be clearly delineated what is in the software package as standard and what is optional. Any module shown and construed to be a part of the basic package that is not delineated will be considered standard.

		Key Functional Criteria R = Required I = Important N = Nice to Have E = Explore	Propo ser Respo nse Y 3P C F N	Comments *if Proposer responds with 3P, C, or F, additional information must be provided as noted on Instructions page. Proposer Response Legend: Y = Fully supported by current software release 3P = Third Party Software C = Customization F = Future Functionality N = Not Supported	Applicable Module(s)
		Summary of Module/Functionality Footprint Requirements			
1	R	Asset Record Tracking	3P	Assets are stored in the ESRI GIS geodatabase.	
2	R	Asset Lifecycle Management	3P	Using asset-based maintenance data from Cityworks, asset life cycle management will be performed with via an integration with Assetic. This can be accomplished with a combination of ESRI and Cityworks APIs.	WO API
3	R	Parts/Supplies Inventory	Y		Storeroom
4	R	Preventive Maintenance (PM) Planning & Scheduling	Y		Office, Field, Respond – Cycled Work Activities
5	R	Work Management	Y		Office, Field, Respond
6	R	Customer Service Requests	Y		Office, Field, Respond

7	R	Billing	3P	We have partners that do this or you can use your own 3rd Party software. Either would need our API's to integrate. Cityworks can – for example – record readings, and we will then integrate with billing applications via	API
				its APIs to provide billing data.	
8	R	Reporting	Y/3P	Ad-hoc basic reporting is included. Custom reports can be created in Crystal Reports.	Office, Field
9	R	Risk Analysis	3Р	We have partners that do this or you can use your own 3rd Party software. Either would need our API's to integrate. Risk analysis will be performed via an integration with Assetic to combine maintenance data from Cityworks with condition and criticality data. This can be accomplished with a combination of ESRI and Cityworks APIs.	SR/WO API
10	R	Capacity, Management, Operations, and Maintenance CMOM Planning & Reporting	Y	Cityworks can act as the repository of operations, maintenance, and asset management data while capacity data would need to be included via reporting or integration. This data will be governed and reported against based on a strategic CMOM framework developed in conjunction with the City.	

		General Features			
11	R	User defined and searchable fields, and user customizable menus and screens/forms to facilitate a more focused user interface for each group of end users.	Y	You can complete customize the interface of office with XML.	Office, Field
12	R	Intuitive system navigation with "click" drill down. Minimize the # of screens and clicks needed to get to the required activity or record.	Y		Office, Field, Respond
13	R	Ability to access in the field on a variety a devices, including laptops, tablets and smartphones. Mobile version of the software must be a lightweight, user friendly version of the application.	Y		Cityworks Field Cityworks Respond Mobile Native iOS & Android
14	Ι	Drill down to transaction detail throughout all modules and across to other modules.	Y/N	Not all "modules" have the ability to drill down to all transaction details. Just office and field.	Office, Field
15	R	Multi directional electronic approval routing.	N	You could use tasks for electronic approval routing. However there is not an official approval process.	Office, Field
16	Ι	Customer definable rules-based workflow rules for sequential, broadcast, and event-based approval routing and record distribution with flags, alerts, triggers and actions based on defined events and thresholds.	N	While many of these items can be handled in Cityworks not all or every possibility is allowed.	Office, Field
17	Ι	System must support interface, content, and workflow customizations by a trained system administrator without programming.	Y	UI changes are in XML, however a programmer isn't required.	Designer
18	Ι	Unlimited notes or text fields.	Y	There are limits to the number of universal custom fields, unlimited within custom field tables.	Setup in Designer and XML
19	R	Full audit trail and history throughout all modules: Date, time, who made the change, retain what was changed, and show new record.	Y	Audit fields can be defined and recorded on data change. The audit fields are managed within the Office mode.	Office, Field
20	R	Customer definable and changeable forms, letters and notifications with context sensitive access. (E.g. condition assessment, homeowner notifications, etc.)	Y		Office, Field
21	Ι	Role-based, user configurable menus, screens, fields, and reports.	Y		Office, Field
22	Ι	Context sensitive help.	N	Help system is an HTML, searchable help system.	CAN #10 2005
					CAIVI # 10-0000 Exhibit 3

23	Ι	Global updates; ability to pick a field where update should be made and have that field update across all like records.	C	Fields updated based on input from other fields would need to use custom triggers. Depending on the location and nature of the field, global updates will be performed through user interface modification (e.g., web service calls embedded within Cityworks) or database modification (e.g., database triggers to update like records).	
24	Ι	Real-time system update and data availability.	Y	As a web based application, data is saved when the form is saved.	All applications with the exception of Mobile Native. Mobile Native is a discounted synced app.
25	N	Ability to have the history from QAlert available.	C	QAlert data will be brought over as part of the integration with Cityworks via its APIs. Alternatively, provided that QAlert data can be made available through web services (either native or custom), the Cityworks interface can be modified to include live QAlert historical data.	SR API
26	Ι	Work on multiple open screens at one time from a single sign-on.	Y	Where applicable as browser tabs.	Office, Field
27	Ι	Ability to have split-screen. E.g. One side of screen has map, other side has new Work Order form.	Y	Map is on separate tab so that it can be its own window side by side with the other window.	Office, Field and Respond
28	Ι	System must have a dashboard style page configurable by each user for viewing assigned or monitored work activities. Should include: cost summaries, to do lists, charts, graphs, maps, reports, etc. should be configurable based on any number of search parameters defined by the user.	Y		Office, Field, Respond
29	R	System must be able to develop maintenance schedule from inventory criteria	N		

		Technology			
30	Ι	Preferably database should be Microsoft SQL Server or Oracle database. If not what RDBMS and versions are used?	Y	See system specification for version support. The latest version of Cityworks supports SQL Server 2008 through 2016 and Oracle 11g R1 through 12c R1.	SQL
31		Identify server/platform. Discuss options.	Y	On premise, physical, virtual or cloud hosted options. Windows Server 2008 or 2012 is required for an	
				on premise solution (servers – physical or virtual – located and maintained on premise) or cloud/hosted solution (e.g., utilizing Amazon Cloud Services). Cityworks can be set to run over SSL regardless of which solution is desired.	
32		Indicate platforms supported and % of installs for each	Y		
33		• Indicate databases supported and % of installs for each	Y	Estimated installs: SQL 90% Oracle 10%.	
34		• Indicate source code language		C++, C#, .Net, HTML, HTML 5, XML, JavaScript.	
35	E	• Hosted/ASP solution. Briefly discuss if this is an option or future option and, if so, describe.	Y	Organizationally hosted on commercial cloud servers (i.e. Amazon), partner hosting or hosted by Cityworks Online (CWOL).	

36	Ι	Web-based architecture with published open Application Program Interfaces (API's.) Briefly describe if you are fully Web-based, and what you have for APIs. Are your APIs configurable by customers to use for new or changed integration or do they require your professional services to change?	Y	We are completely web- based and developed with JSON rest APIs, with the exception for Native iOS & Android apps that synch to the web application database. APIs are available and open for any development by licensed organizations. API's are not configurable and the organization must change the integration to match the API.	Office, Field, Respond. An API for Storeroom is soon to be released.
37	Ι	Supports Microsoft Active Directory. Single sign-on integration with Active Directory.	Y	Cityworks Supports Single Sign-On with AD, but only as a pass through of the username and password, not the rules or permissions.	Office, Field, Respond
38	Ι	Supports virtual server environment utilizing VMWare	Y	See Virtual Statement. Cityworks can run in a completely virtualized environment.	
39	Ι	Row lock security.	N	Cityworks stored procedures do not utilize row locking.	
40	Ι	Fully supports/compliant with Service Oriented Architecture (SOA). Please explain/discuss.	Y	Our platform is Fully customizable off the shelf. With JSON rest services for API's.	
41	R	Attach electronic files (e.g. JPEG, PDF, Word, wav, MP3, WMV, TIF, etc.) to various records and fields such as for a specific asset. List all file types supported.	Y	Any file type attached to request, work orders or inspections. Attachments on asset can be done at the GIS attribute level or within Cityworks Attachment tool. To view the attachment the person must have that type of software. Example a Word Doc will require a .doc viewer.	Office, Field, Respond, Native Mobile, other add-ons as well Within Respond and Native iOS and Android on requests, work order and inspections, not assets.

42	Ι	Attach AutoCAD DWG files to various records, fields and assets. Please explain/describe if you have the ability to open and read the DWG files from your proposed software.	Y	Any file type attached to request, work orders or inspections. Attachments on asset can be done at the GIS attribute level or within Cityworks Attachment tool. Cityworks DOES NOT have a Viewer for attachments.	Office, Field, Respond, Native Mobile, other add-ons as well Within Respond and Native iOS and Android on requests, work order and inspections, not assets.
43	R	Email distribution of reports, approval requests, etc. from within the system.	Y/N	Reports are not sent out by email, however a task for report creation or approval can be sent out by email. Also a report can be printed to PDF and Manually emailed.	Office, Field, Respond
44	Ι	Bi-directional integration with Microsoft Office (especially Excel and Word)	Y/N	Export to Excel from ad- hoc reporting in one direction. Imports into tables can be imported in some tables as import tools or using Cityworks for Excel or Table Editor tool. No Integration with Word, PowerPoint, etc.	Ad-hoc report exports in Office Table Editor in Office Some imports in Designer (admin) Bidirectional in some cases using Cityworks for Excel
45	R	Remote access. Support for Mobile Technologies IOS and Android	Y		Native iOS & Android Cityworks Apps
46	I	Mobile technology interfaces should be customizable to the user role and provide a simple and direct platform so in-field crews have a minimal number of work steps to complete updates and check-ins.	Y/N	Mobile Native for iOS and Android are streamlined for the field user. These cannot be changed. Respond is a connected browser app that is responsive to device. More customization can be done to it.	Mobile Native (iOS and Android) Within Respond mode and HTML5 customization. Note all Cityworks modes can be run on browser based mobile devices.

47	Ι	Describe any integration with CCTV to track video information real time to specific asset locations.	Y	Cityworks pulls data from the PACP compliant database into the Cityworks structure. Also there is a bidirectional import/export of some GIS information.	CCTV Interface to PACP
48	Ι	Describe your touch screen capability for field data entry and mobile technology compatibility.	Y	All Cityworks UI's work with touch screen devices, however Cityworks Respond and Native iOS and Android apps were designed specifically for this.	Respond Native iOS & Android apps
49	Ι	.NET architecture. Briefly describe if you are fully .NET or only in certain modules. If not .NET what programming functionality is used (e.g. Java)?	Y/N	C++, C#, .Net, HTML, HTML 5, XML, JavaScript.	
50	R	Workflow capability built on Windows Workflow Foundation (WF45) -Describe application and user security features/capabilities. Indicate any special security features (e.g. user security, function security, file security, field level security, etc.) provided by the software.	Y/N/C	No workflow capability based on WF45. To access the application, Cityworks supports forms and Windows authentication and can be set to run over SSL. Within the application, Cityworks supports custom levels of security access to various administrative functions as well as work activity template level security as defined by administrators. Field level security is not natively supported but will be implemented via user interface customization as needed.	Office, Field
51	Ι	Compatibility with GPS/AVL technology in field vehicles.	3P	Using ESRI compatible systems 3 rd Party Systems.	

	R	Data Conversion / Retention			
52	R	Ability to convert data from other EAM/CMMS systems (Cayenta, QScend QAlert, Hansen). Please list what systems you have converted data from.	C	While it generally involves some data transformation, data from other CMMS applications will be converted and imported into Cityworks using either the APIs or direct database insert. Our data migration experience includes Hansen, Lucity, MP2, Maximo and numerous homegrown applications ranging from Access databases to enterprise Oracle applications.	
53		Please describe your Data Retention capabilities. Can records, attachments be flagged with different retention schedules?	N	All data is kept in the system for as long as you need.	
	R	Training			
54	R	Ability to provide in-person training on all modules selected.	Y	We will provide onsite, in-person training with customized training materials that allow users to train on their processes, not generic instructions.	
55	R	Ability to provide in-person system administration training.	Y	We will provide onsite, in-person Cityworks administrator training.	
	R	Interfaces / Integration			
56	Ι	Experience integrating with external applications such as Cayenta Yes/No Kronos Yes/No Laserfiche Yes/No BuySpeed Yes/No Lawson Financial Yes/No	Y	We have experience integrating Cityworks with numerous external applications. We have experience integration with Cayenta, Kronos, Laserfiche, BuySpeed, and Lawson Financial.	
57	E	Utility Billing: Software is Cayenta What experience do you have with integrating or interfacing with it?	Y	Extensive experience integrating with Cayenta.	
58	R	Water and Sewer Hydraulic Modeling: Software interfacing with Innovyze, InfoWater Suite and InfoSWMM, respectively (ArcGIS10.1 or higher compatible)	Y	We have extensive experience with Innovyze, InfoWater, and InfoSWMM and integrating those applications with Cityworks data.	

59	Ι	Do you have a client portal, or the ability and experience to integrate with one? Move to customer relations area	Y/3 P	APIs are available for development of a portal or out of the box, Cityworks bundles with a Citysourced or SeeClickFix web portal. We have extensive experience with developing and/or integrating Cityworks with public facing portals.	Service Request API
	R	GIS Integration			
60	R	The system shall utilize the City's enterprise geodatabase as the asset inventory.	Y	This is the fundamental design of Cityworks as the original and founder of this approach.	Office, Field, Respond, Mobile Native
61	R	The system must use non-redundant asset data storage with no reliance views, data mapping or synchronization.	Y	This is the fundamental design of Cityworks.	Office, Field, Respond, Mobile Native
62	R	System must support ESRI ArcGIS Sever 10.4 or current version and maintain compatibility with the most current version of ESRI GIS software within 6-months of an ESRI version release.	Y	See system specification provided.	Office, Field, Respond, Mobile Native
63	Ι	The system shall utilize inherent ESRI spatial functions such as system trace, valve isolation, etc.	C	Using ESRI Geodatabase development these tools can be plugged into the Cityworks map, but would need to be developed. These functions can be utilized in ArcMap and results published to Cityworks or Cityworks Map plugins can be developed for more interactive functionality.	
64	Ι	System should be designed to work primarily with GIS data, where geographic features (e.g. pipes) represent assets. It must integrate with the City's existing enterprise geodatabase, ArcGIS Server software and ArcGIS Online. The software should not require converting to a different format.	Y	This is the fundamental design of Cityworks.	
65	R	System MUST be non-modular for asset types and functional groups. Core system must be configurable for unlimited asset types and asset groups without additional modules or licensing cost.	Y	This is the fundamental design of Cityworks.	CAM #18-0085

66	R	System should utilize the ESRI geodatabase as the only asset database/repository and link to it out-of-the-box without additional add-ons or software licensing. All asset geometry and attributes must reside in the geodatabase and should not require middleware, modules, or synchronization with the work management database.	Y	This is the fundamental design of Cityworks.	
67	R	System should not set limits on the number of assets or the size or complexity of the asset data, other than those imposed by the underlying ESRI software	Y	This is the fundamental design of Cityworks.	
68	R	System should support and detect relationship classes within the GIS	Y	This is the fundamental design of Cityworks.	
69	R	The system should have the ability to query and filter the ESRI geodatabase from within the EAMS* software	Y		
70	R	System should provide a map interface, allowing the user to view assets, search, pan, zoom, locate, measure distances and include the capability to view information about assets' attributes from the GIS.	Y		
71	R	Map should be comprised of ArcGIS Server Map Services hosted on the City's ArcGIS Server or ESRI ArcGIS Online Services, or a combination of both.	Y		
72	R	Must support multiple map services, specific to users or groups of users, to meet the various GIS needs of each work business unit.	Y		
73	R	Ability to locate address utilizing ArcGIS locating services (geocoding service).	Y		
74	R	Ability to select assets in the GIS map and create work orders and inspections associated to the selected assets.	Y		
75	R	Ability to attach multiple assets to a work order.	Y		
76	Ι	All work activities, (requests, work orders, inspections, etc.) should be displayed live on the map interface based on user preferences. User should be able to open activities from the map.	Y		
77	R	Ability to update asset attributes from within the EAMS software. All updates should utilize ESRI technology so as to maintain the integrity of the GIS system.	Y		Office, Field
78	R	Ability to easily publish work activities within the AMS software to REST endpoints for consumption on ArcGIS Server or ArcGIS Online.	Y		eURL

79	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all assets in a specific neighborhood."	Y		Office, Field, Respond
80	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all assets in a user defined area."	Y		Office, Field, Respond
81	Ι	Display on a map the location and status of selected work order(s); examples of selection sets: all work orders for today, since a certain date, of a certain type or types, etc.	Y		Office, Field, Respond
82	R	Create and close a work order from a selected map feature(s) and a service request from a location(s).	Y	Can create and open (to close) any works orders from selected map features.	Office, Field, Respond
83	R	Display user-configurable map views; i.e., the ability to have different map layers visible based on preference, display scale, and/or work role.	Y	User profiles have assigned map views as definable map services.	Office, Field, Respond, Mobile Native Apps
84	R	Map viewer should provide tools to users for performing basic geographic-related tasks: for example, calculating measurements for length, and area, and determining relationships between assets, work orders, service requests to other GIS features like address points using buffer, intersection, and tracing tools.	Y/N	Not all the examples are provided, however a 3 rd party could add the ones that are not out of the box.	Office, Field, Respond
85	Ι	Print and/or export (for example, PDF format) a map with a legend, bar scale, and notes displaying work order or asset location.	Y/N	Notes cannot be added, but the Legend and bar scale are on the page.	
86	Ι	Describe dispatch and routing capabilities for the EAM using maps so crews can be directed to assigned service requests/work orders as efficiently as possible. Captured in 89	Y	JS Map Routing tool uses the ESRI's Routing Service. Multiple Cityworks Activities, addresses, and points (by clicking on map) can be manually entered and a shortest path is determined. Turn by turn directions are presented to the user. The Native Mobile app uses the mobile devices (iOS or Android) native mapping service to route to a Cityworks activity.	Office, Field, Respond and Mobile Native Apps
87	R	Create location-based reports (geo-reports) of assets or work orders based on geographic region or user defined areas and subjects. For example: how many work orders were completed last year in a specific District, neighborhood or groups of neighborhoods? Or how many flooding service calls were reported in a user-defined area?	Y	There are many ways to do this. Using the map and/or searching tools. In Cityworks or in ESRI with a connected table. It just really depends on what is needed.	Office, Field

	R	Asset Record Tracking, Inspection and Condition Analysis			
88	R	Asset master record that supports, including but not limited to any of the following attributes: category, sub-category, asset number, related numbers (e.g. serial number, Proposer number, etc.), parent/child relationships, acquisition date, install date, disposal date, expected useful life, location, department, person asset is assigned to, GPS coordinates, unit of measure (lineal feet, cu. Meter), AP Voucher #, PO #, Proposer, warranty information, disposal cost, salvage value, as- built diagram, photo, related nested assets and various attachments.	Y/N	Any asset attribute can be created on assets in the GIS. Within the inventory ware house system, some custom fields can be created, but they may be limitations.	Yes for asset in Office, Field, Respond Partial for inventory in Storeroom.
89	R	Briefly describe your best practices for the asset creation process (e.g. create asset and numbers in GIS, then push to EAM; or create asset and numbers in EAM, then push to GIS; or both; or without push). Do they vary by asset type? Presentation Question then delete	Y	Many options and workflows are available using ESRI editing tools and Cityworks editing tools. However, neither option requires you to push the information. You would be using the GIS. However, neither option requires you to push the information. You would be using the GIS data directly.	ESRI editing Cityworks Editor in Core Table Editor in Core Cityworks for Excel Equipment Changeout for related asset feature (objects)
90	R	Ability to capture inventory of roadway and Storm Water system features that are not traditionally considered "assets," such as pavement surface, shoulders, ditches, back slopes, and enclosed conveyance systems. All system functionality associated with traditional assets must apply to these inventory features.	Y	Asset database can use feature points, lines, polygons or objects (non-spatial). Additionally asset along a road can be modeled as attributes (i.e. sidewalk along a road). Work activities for miscellaneous assets can be created at XY locations. Also in the next release Cityworks will be support ESRI Roads and Highways in Office and Field.	Office, Field, Respond
91	R	Capture several dates on asset master record (e.g. original date put into service, refurbished, warranty work completed, etc.).	Y	Any asset attribute can be created on assets.	ESRI GIS
92	Ι	Capture dimensional attributes of an asset and its components (e.g. shape of an underground vault, location of components).	Y	Any asset attribute can be created on assets.	ESRI GIS
93	R	Ability to add and adjust asset information with permissions – warranty, expected life of asset, etc.	Y	Any asset attribute can be created on assets permissions can be setup for editing of the GIS data.	ESRI GIS

94	Ι	Field ability to pull up as-built diagrams, image files, multimedia files etc.	Y	Any asset can have attached files. Work activities can have attachments such as instructions, operations manuals or design files. The field device must have the native app to open the attached file type.	ESRI GIS
95	R	Easily transfer an asset and all related records and history to another location or facility, tied to GIS.	Y	Yes, for object asset types (equipment) using GIS relationship-classes.	Cityworks Equipment Changeout tool
96	R	Ability to group assets within a category and area in GIS format to help schedule and coordinate preventive maintenance activities.	Y	As designed in the data model. This is supported natively by Cityworks via the Cityworks map.	ESRI GIS, Office, Field, Respond
97	Ι	Ability to track asset and infrastructure maintenance within a user definable geographic boundary.	Y		Office, Field, Respond
98	R	Track asset activities and history for unlimited years (e.g. repairs, replacement, refurbishment, maintenance, upgrades, retirement, abandon- in-place, disposal cost, etc.).	Y	As defined in work activity templates.	This is Cityworks in General.
99	Ι	Ability to collect and store condition assessment data against an asset e.g. number of leaks, number of repairs, defects, thickness measurements, anode deterioration, safety issues, etc.	Y	Any asset attribute can be created on assets. Some items on an inspection or work order can automatically update the GIS. Other items you will need to update manually.	Office, Field, Respond and ESRI GIS
100	R	Captures and stores for assets the results of various inspections such as the City's NDPES SWOPS, flow monitoring, I/I investigations, smoke testing, hydrant flow testing, back-flow preventions devise testing, pump efficiency testing, etc.	Y	Inspections.	Office, Field, Respond, Mobile Native
101	R	Inspections must provide flexibility for user defined fields and forms.	Y	User defined inspection forms.	Setup in Designer (admin)
102	R	Ability to define custom inspection observations with weighted scoring by asset type. Weighted scoring should result in a condition score on the asset. Scoring weights should be defined by city.	Y	User defined inspection forms.	Setup in Designer (admin)

103	R	Ability to conduct a condition analysis from within the map interface, combining inspection data and GIS attributes which results in the selection of assets based on condition score range.	Y/C	Condition data can calculate a condition score on the GIS attribute. Combining inspection observation and GIS attribute data may require custom database triggers Condition data can be natively calculated and analyzed via inspection observation data on the Cityworks map. Combining observation data and other GIS attributes will require a custom map plugin or analysis results be published to Cityworks via ArcMap.	
104	R	Ability to summarize asset condition by heat maps.	Y		
105	R	Must have the ability to perform asset condition modeling, depreciation and valuation completely without reliance on outside software.	3P	This will be achieved with an integration with Assetic.	
106	Ι	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all assets inspected on a certain date in a specific neighborhood."	Y	If the data is captured in the GIS correctly Provided the necessary parameters are available in the GIS and the work orders/inspections are attached correctly.	Office, Field
107	Ι	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all assets inspected on a certain date in a user defined area."	Y	If the data is captured in the GIS correctly. This is available natively in Cityworks.	Office, Field
108	R	Condition tracking with actual useful life, customer-defined conditions, replacement cost and time analysis independent of financial depreciation.	3P	If this data is available in the GIS, an integration with Assetic will perform condition tracking.	
109	R	Ability to track and manage compliance reporting, develop risk profiles, status of agreements, permits, etc. pertaining to the condition of assets.	3P	If this data is available in the GIS, an integration with Assetic will analyze and report on this data.	
110	Ι	Provide configurable alerts based on asset conditions and level of service.	С	This will be achieved via database triggers, monitoring processes, or reporting.	CAM #18-0065

111	R	Field ability to remotely pull up the complete history of an asset. Field ability to update or add an asset.	Y		Field
112	Ι	Ability to track assets within a building. E.g. Conference Rooms, restrooms, card readers.	Y	As asset are defined in the GIS using relationship-classes (asset hierarchy).	Office, Field, Respond
	R	Asset Lifecycle Management			
113	R	Briefly discuss your asset lifecycle management functionality. E.g. asset productivity, analyze lifecycle and lifecycle costs of asset, types of assets, risk assessment and risk management and categories of assets in compliance with utility asset management standards. Discuss your experience.	3Р	Using asset-based maintenance data from Cityworks, asset life cycles will be managed via an integration with Assetic. Categorizing assets into management strategy cohorts for analysis purposes allows us to readily apply maintenance, inspection, and cost data from Cityworks as well as risk and condition data from GIS to effectively manage asset life cycles.	
114	R	Briefly discuss how you comply with utility asset management standards for properly handling assets for water, wastewater and storm water utilities. E.g. tracking assets, asset classifications, cost categories, asset life, and risk assessment.	3P	We will ensure assets within the GIS (and therefore managed in Cityworks) are properly attributed with best appropriate asset management data fields according to ISO 55001 standards. This includes but is not limited to classification, cost, estimated life, condition, and risk data.	
115	Ι	Put in an asset #, address, cross street or other attribute and see planned projects impacting that asset (e.g. for linear/horizontal asset, see other utility maintenance work projects, overlays, CIP).	Y	Using mapping and searching tools.	Office, Field
116	Ι	Predictive analysis for asset useful life and lifecycle maintenance.	3P	Using asset-based maintenance data from Cityworks and base asset data contained in GIS, predictive analyses will be managed via an integration with Assetic.	

117	Ι	Manage and track all construction and maintenance costs for non-City assets for which ownership is later transferred to the City. E.g. a developer owns and pays for the construction of his own water and sewer system (the City could be in charge of doing the construction for the developer). After two years and passing City warranty and compliance requirements, ownership is then transferred to the City. Transfer could be at no cost, but asset value and ongoing asset maintenance costs need to be tracked.	Y	Using placeholder data in GIS, developer funded projects will be tracked natively in Cityworks before transfer. After transfer, asset records will be created, and costs and maintenance associated with the transferred assets will be tracked natively in Cityworks.	Office, Field
118	Ι	Plant equipment depreciation tied to utility asset lifecycle calculations (predictions of useful life based on historical data). This is different from accounting depreciation.	3P	Using asset-based maintenance data from Cityworks and base plant equipment data, useful life analyses will be managed via an integration with Assetic.	
119	N	Side-by-side visual comparisons of an asset from one inspection vs. another. E.g. visual comparison of a segment of pipe inspected and photographed in 2011 vs. inspected and photographed in 2007.	С	Side-by-side visual comparisons using attached photographs will be performed with user interface modifications within the Cityworks inspection.	
	R	Parts/Supplies Inventory			
120	Ι	Support multi-location inventory warehouses for supplies, parts, and equipment/assets where the same item number may be in inventory in multiple locations.	Y		Storeroom
121	Ι	Easily transfer supplies, parts, etc. from one warehouse location to another. Update records and credit/charge impact for each department involved.	Y/N	Using the Transfer Tool.	Storeroom
122	R	Ability to assign asset to one or more business units and be able to transfer between units.	Y	One of the Primary Functions in Storeroom.	Storeroom
123	R	Ability to create categories, assign assets, re- categorizes assets.	Y	Part of Material setup.	Storeroom

124	R	Experience interfacing with financial systems for purchasing, matching and valuation.	C	Accomplished through the implementation partner. Additionally release 15.2 will have API's exposed for Storeroom. This will be performed via direct integration or using Cityworks' Storeroom API (available in 15.2 or later). We have experience with procurement integrations between Cityworks and Tyler Munis, Great Plains, and Lawson Financial.	APIs
125	R	Ability to individually create or archive assets.	Y	One of the primary functions in Storeroom.	Storeroom
126	Ι	Min/max order quantities and re-order lead times that trigger suggested purchase requisitions.	Y	System will track min/max and store information give suggestion on reorder qty. Will not automatically trigger requisition.	Storeroom
127	Ι	Ability to value parts individually or in groups (e.g. single valve cover, all valve covers).	Y	One can assign value to each part. No group costing. Reports and searches can be created to get this information.	Storeroom
128	Ι	Support bar code reading for additions and depletions to inventory. Or do you have a barcoding system apart of the system? Explain if you have partnerships with hardware providers.	Y	Barcoding capability in the form of scanning a barcode (material ID, Description, Part number) and populating the search function and displaying the item associated with the barcode. This is done with wither a Bluetooth scanner connected to a laptop, tablet or phone. Also attachable scanners to phone or tablet.	Storeroom/Crys tal Reports
129	Ι	Easily return materials to inventory that were not used on a work order or service call.	Y	One of the primary functions in Storeroom.	Storeroom

130	Ι	A-B-C cycle counting tools/scheduling for parts, supplies, and equipment/assets inventories.	Y	One of the primary functions in Storeroom.	Storeroom
	R	Preventive Maintenance (PM)/Scheduling			
131	R	Define Preventive Maintenance Tasks to include default information: area, category, sub- category, tasks, procedures, hours, materials, equipment, skill set, staff assignment, etc.	Y	Most of these items as default values in a work order template.	Office, Field some info also in Respond
132	R	Maintenance triggers and schedule based on customer defined parameters such as warranty expiration, usage hours, flow volumes, asset age, environmental conditions, average expected life, time milestones (e.g. every 5 years), etc.	Y/C	Cityworks will handle time milestone based PM activities natively. Other maintenance triggers will be customized via database triggers or monitoring procedures.	Office, Field
133	R	Ability to schedule equipment preventive maintenance and track and report on results.	Y		Office, Field, Respond, Mobile Native apps
134	Ι	Create and maintain a calendar and schedule for staff, activities, maintenance, and offer workload management features.	Y/N	As dashboard lists expandable to a calendar view using saved searches. No Workload Management Features Available other than manual management.	Office, Field
135	R	Auto-generate work orders with default information from predefined Preventive Maintenance tasks.	Y	As predefined parent PM work orders not as tasks within a work order.	Office, Field, Respond, Mobile Native apps
136	R	Create a single preventive maintenance work order for like horizontal assets.	Y	Yes you can search for the assets that are alike and create a single work order for all assets.	Office, Field
137	R	Handle preventive maintenance management and asset management for vertical assets (e.g. a building and its components).	Y	As PM cyclical work orders.	Office, Field, Respond
138	R	Handle preventive maintenance management and asset management for linear assets. E.g. pipes, pumps, meters, etc. that comprise a whole main system, enclosed drainage systems, shoulders, ditches, back slopes, and paved roadway surfaces.	Y	As PM cyclical work orders.	Office, Field, Respond, Native Mobile Apps

139	Ι	Performance-based asset maintenance. E.g. tied to incident reports and SCADA detail.	С	SCADA integrations possible. Provided activities can be linked with work order IDs or asset IDs, maintenance data in Cityworks will be associated with incident reports and SCADA via	Metrics API
140	R	Report on condition of assets (customer defines conditions; different conditions for different assets). E.g. Condition of chambers, pipe nodes, etc.)	Y	Using reporting from a combination of asset attributes, work history or inspection history.	Crystal Reports
141	R	Provide ability to schedule inspection and condition monitoring of assets and inventory and create work orders and task level workload and budget forecasts for all maintenance activities.	Y	This will be performed natively in Cityworks provided all data details are populated to allow for task level forecasting.	Office, Field
142	R	Customer defined inspection templates (e.g. test results, photos, checklist of inspections activities, etc.)	Y		Office, Field, Respond
	R	Work Management			
143	R	Unlimited Work Order attributes such as Department, Division, group, category, sub- category, SLA by category, status, location, Project #, Service Order #, description, incident reported time and date, completion time and date, assigned staff, labor hours and cost by technician, material quantities and cost, cause code, solution, test results, user defined fields, etc.	Y	Using custom or universal custom fields and user defined asset attributes.	Office, Field, Respond, Mobile Native Apps and ESRI GIS
144	R	Assign resources to work orders" to see how many people and what materials and equipment are needed (generally) to perform standard tasks.	Y	Estimates for labor, material and equipment can be defined either as defaults or as work or as work order is being planned.	Office, Field
145		Ability for resource allocation so that work orders are tied to available staff, materials and equipment. I.e. a person can't be assigned work orders exceeding their shift hours, work orders cannot be assigned to equipment that is out for maintenance, or for materials that are out of stock, without appropriate warnings and overrides.	Y/C	Cityworks will manage out of stock materials and out for maintenance equipment natively (provided material and equipment data is kept up to date) with minor alert customization. Validation of work assignment to employees only during their working hours will require custom data tables and user interface customization.	Office, Field

146		Ability to provide Dynamic Master Planning - Integrated and continuous updating and planning for water, sewer, and storm water systems	3P	Dynamic Master Planning will be supported with an integration with Assetic.	
147	R	Create and assign priority and status criteria for work orders via defined service levels.	С	Where necessary, work order priority and status data will be driven by defined levels of service via user interface modification, database triggers, or monitoring processes.	
148	R	Ability to define unlimited work order activity types for any asset type defined in GIS.	Y		Designer
149	R	Ability to generate work orders from service requests, creating relationships between work orders, and attaching work orders to any number of assets or to locations without assets.	Y		Office, Field
150	R	The work order system should track parts, labor, equipment, and other costs/resources associated with the work activity.	Y		Office, Field, Respond, Mobile Native Apps
151	R	Costs should be associated to assets on the work order and asset costs should be easily reportable from with the system.	Y		Office, Field
152	R	Should support capability to dispatch work orders to work crews. Work crews should be able to access and prioritize work orders by multiple attributes.	Y		Office, Field, Respond. Mobile iOS and Android cannot.
153	R	Ability to create work requests from inside the map interface. Ability to view all work activities on a map and label by priority, status, type, etc.	Y		Office, Field, Respond, Mobile Native, using Event Layers
154	R	Track relationship between service request and work order.	Y		Office, Field, Respond
155	R	Ability for personnel to select and review work requests and work orders using multiple selection and sorting criteria that include all work request, work order fields, and any geographic area available in the enterprise geodatabase.	Y/N	You can Query by a drawn polygon, but not off of a predefined Geographic Area.	Office, Field
156	R	Ability to view all work activities on a map and label by priority, status, type, etc.	Y/N	Work Activities can be color coded by a search, but not labeled.	Office, Field
157	Ι	Ability to attach multimedia files to work order.	Y		Office, Field, Respond, Mobile Native
158	Ι	Ability to organize work orders and associated costs to project with a budget.	Y		Office, Field
159	Ι	Ability to modify (hide, relocate, repurpose, etc.) all fields on end user forms/screens.	Y	You can use XML to relocate/repurpose rename/hide/etc.	Office, Field CAM #18-0085
160	Ι	Ability to establish required fields so as to ensure data input integrity.	Y	Some fields can be required.	Office, Field, Respond
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161	N	Ability to assign maintenance scores to work activity types.	Ability to assign maintenance scores to work Y O Rativity types. Y		Office, Field, Respond, Mobile Native Apps
162	R	Must be able to update GIS attributes with fields from the work management system automatically (no manual or scheduled push to GIS).	Y	Certain fields can be auto populated to the GIS upon a trigger like closed Work Order.	Office, Field
163	Ι	Must be able to report on total cost of maintenance for one or many selected assets.	Y	Ad-Hoc Reports or Crystal.	Office, Field, Crystal Reports
164	N	Ability to view work activities on a calendar.	Y		Office, Field
165	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display work on a certain date in a specific neighborhood."	Y/N	You can draw a boundary of the neighborhood to accomplish this.	Office, Field
166	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display work on a certain date in a user defined area."	Y	You can draw a boundary of the neighborhood to accomplish this.	Office, Field
167	Ι	Provide escalation process and approvals for emergency and priority requests.	Y/N	This is not an automatic escalation, however using the status field with user defined codes you can Manually Escalate.	Office, Field, Respond
168	R	Notify user upon work order creation that a similar work order for the same asset already exists.	Y	A unclosed work order list for the asset is provided on creation screen.	Office, Field
169	R	Allow assets without fixed locations to be added to work orders (e.g. right of way mowing).	Y	As long as it's in the GIS data as a point, line, polygon or related object.	Office, Field
170	R	Allow work orders to be created and closed without assets tied to them.	Y		Office, Field, Respond
171	R	Ability to modify work order type.	Y		Office, Field
172	R	Track materials issued to a work order; interface to Inventory module for automated adjustments to inventory levels.	Y		Office, Field, Respond, and Mobile Native Apps with Storeroom
173	R	Generate a Work Order that includes maintenance on multiple assets.	Y		Office, Field, Respond, Mobile Native Apps
174	R	Generate a single Work Order that includes multiple tasks or activities.	Y		Office, Field, Respond, Mobile Native Apps

175	R	Groups associated or nested assets and create a single work order for that group. For example a storm water detention system could consist of multiple assets of different types, so the EAM should allow users to create a work order against the detention system that includes all its associated assets.	Y		Office, Field, Respond
176	Ι	Connect follow-up or subordinate work orders to a primary or original work order.	Y	As child work orders.	Office, Field
177	Ι	Ability to group work orders into a "project."	Y		Office, Field
178	R	Ability to categorize and enter into system work orders that represent work done for a calamitous (FEMA) event.	Y	Categorized for reporting using the project field.	Office, Field, Respond
179	Ι	Ability to assign status to work order as a whole, or to individual tasks or activities within it, update that assignment and check on progress.	Y	Yes using the Work Order Status Field, and the Task Status Fields.	Office, Field, Respond
180	R	Automatically generate recurring work order based on schedule defined by user, WO or asset type. Allow override of default parameters.	Y		Designer setup
181	R	Ability to schedule and assign preventative or routine work orders for future and planned maintenance.	Y		Office, Field
182	R	Ability to create standard pick lists of employees, materials, equipment for assignment to work orders.	Y	Using defined crews (labor, materials, equipment).	Office, Field, Designer
183	R	Ability to generate a daily work list for staff based on work orders and assigned tasked and estimated time to complete them.	Y/N	This is not based off estimated time to complete. However we can display in a dashboard, on mobile inboxes or reports a work list assigned to them.	Office, Field, Respond, Mobile Native Apps
184	R	Ability for leads to view activities and status of each crew.	Y		Office, Field, Respond
185	Ι	Ability to schedule closures; shut downs by date, or by date and time.	Y		Office, Field, Respond
186	Ι	Notification to field crews that an update to a work order has been made.	Y	As email triggers from @tags in comments. Or if one of the 7 Work Order Triggers are activated.	Office, Field, Respond, Mobile Native Apps
187	R	Provide costs and percent complete of delineated program; i.e. measuring progress on street sweeping.	N	No percent complete on work orders, however units accomplished field or checkbox on asset can be used.	

188	E	Capture time entry direct from field staff or via integration to Kronos. Please describe your functionality. The goal would be one point of entry for time capture and leave requests that then automatically feed Payroll and HR, project accounting, and work order activity reporting.	Y/C	Cityworks can natively capture labor time, apply up to eight percentage or fixed multipliers, and distribute that time across tasks as well as assets. We will push labor hours entered in Cityworks to Kronos via an integration. Work activity reporting will occur natively in Cityworks.	Office, Field, Respond, Mobile Native Apps	
189	R	Capture multiple lines of time entry per work order spanning dates and different employees and Proposers.	Y Cityworks supports (multiple labor entries (for 1 one or more employees) J per work order spanning any time period.		Office, Field, Respond, Mobile Native Apps	
190	Ι	Ability to account for non-productive time or time not associated with an asset so that all personnel time is captured for timekeeping interface and labor distribution reports.	Y	Cityworks supports the ability to create non- productive work activities or tasks where labor can be attributed.	Office, Field, Respond, Mobile Native Apps	
191	Ι	Ability to collapse the project time tracking detail into categories for payroll purposes: E.g. .5 hours on water main, .5 hours on drain pipe collapses to 1.0 hours regular time for payroll purposes.	С	The integration with Kronos will collapse labor hours as needed for payroll purposes.		
192	Ι	Discuss how your application synchronizes after temporarily losing cell data connectivity (e.g. the work is done in the basement with no data coverage).	Y	The only piece of software that can be disconnected is Mobile Native iOS and Android	Cityworks Native iOS and Android apps support disconnected use.	
	R	Request Management & Call Center				
193	R	The EAMS software should provide functionality for logging, mapping, and tracking calls for service.	Y		Office, Field, Respond	
194	R	Ability to define service request types and user defined caller questions, instructions and comments.	Y		Designed in Designer (admin)	
195	R	Ability to log calls from internal and external customers.	Y		Office, Field, Respond	
196	R	Ability to turn caller information recorded on a Call Center Work Request into Work Orders.	Y		Office, Field, Respond	

197	R	Ability to select calling customer's address and/or name from list generated from billing application.	Y/C	Data would need to be imported from CIS on a data update through scheduled routines. Cityworks supports this functionality natively, but we will develop an update process to ensure customer data from the billing application is synced with customer data in Cityworks.	Office, Field, Respond
198	R	Ability to record information regarding caller if different from property owner.	Y	You would just use the caller info not the property owner.	Office, Field, Respond
199	R	Uses ESRI Geocoding services for address locator, including cross streets.	Y		Office, Field, Respond and ESRI
200	R	Ability to route request to city staff by geographic layer as defined in the GIS.	Y	You can set up areas of Geographic regions to route your Request.	Office, Field, Respond
201	R	Ability to track multiple callers per request.	Y		Office, Field, Respond
202	R	System should prompt call taker if there is an open request of the same type in the same general area so as to reduce duplicate effort.	Y		Office, Field
203	R	Link multiple Service Orders (generated from citizen requests/complaints) to a single Work Order.	Y		Office, Field
204	R	The system must directly interface with Outlook email program so that a work request is easily replicated into an email to send outside the software.	Y	However, emails can be sent directly from Cityworks using email client. Work activities can be sent via email at any time from within Cityworks. In addition, email rules can be configured in Cityworks to automatically send emails based on specific events (e.g., work order closure, creation, etc.).	Core and email client
205	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all requests in a specific neighborhood."	Y/N	You can draw a boundary of the neighborhood to accomplish this.	Office, Field
206	R	Ability to use all geographic area map services available to perform geospatial queries such as "select and map display all requests in a user defined area."	Y	You can draw a boundary of the neighborhood to accomplish this.	Office, Field

207	Ι	Provide a web-based portal for the public (external customers) to create and submit requests for service.	С	We have extensive experience with developing and/or integrating Cityworks with public facing portals and will provide a solution as needed. Alternatively, Cityworks bundles with Citysourced or SeeClickFix.	
208	R	Provide a web-based portal for City employees (internal customers) to create and submit requests for service.	Y	Cityworks is Web-based. They would need a login to the system.	Office, Field, Respond
209	R	Alerts for multiple service requests for the same asset/feature.	Y	When you go to create a Work Order the System shows all open Work Orders on that Asset. Service Request are not associated with assets.	Office, Field
210	R	Assign priorities for service requests based on service type, service level, and supporting authorized user overrides.1	Y/C	Cityworks natively allows for predefined priorities based on service type, Q/A driven priority escalation, and user overrides. Custom business rules for priority and setting authorization rules for the priority field will be customized as necessary.	Office, Field
211	R	Track service requests or work orders by date, geographic area, asset, type, priority, assignment and duration.	Y	All of this data could be tracked.	Office, Field
212	R	Track all service request costs, both reactive and emergency work. Ability to breakout a priority level for emergency service requests.	Y	Service Request could have labor costs. All other costs would go to the work order attached to the request.	Office, Field
213		Ability to automatically e-mail customer the status of a Customer Service Request as it is processed.	Y	Based on certain changes a Customer can be updated by email.	Office, Field, Respond, Mobile Native App
	R	Billing			
214	R	Generate report to identify Work Orders that have been flagged as billable.	Y	Ad-Hoc Report or Crystal Report.	Office, Field, or Crystal Reports
215	R	Integration with ERP Accounts Receivable for invoice creation and distribution.	C	This will be performed via direct integration or using Cityworks' Storeroom API (available in 15.2 or later).	

216	R	Support asset planning and budgeting process (e.g. FTE staff level planning to support desired service levels, costs to perform maintenance tasks, etc.).	C	We will provide past maintenance cost data from Cityworks via reporting to assist future planning activities.	
217	Ι	Ability from one Work Order to allocate labor and material costs to separate departments for shared projects, cross-billing, chargebacks and facilities.	Y	Account Field for Every Labor, Material, or Equipment Entry	Office, Field, Respond, Mobile Native Apps
	R	Reporting			
218	R	Indicate reporting tools offered. If 3 rd party, list Proposer. Discuss integration to core suite and strategy to stay current with version releases.		Cityworks has its own ad- hoc search/report tool. However Crystal Reports Runtime is also built in and supported. You would just need a copy of Crystal Reports to create the .rpt so it can be uploaded and used by everyone with permissions. However many other reporting tools have also been used through ODBC connection like SQL Server Reporting Services, or Access.	Office, Field
219	R	Describe data output formats (e.g. XML, Excel, CSV, etc.)		Excel or a printed PDF, eURL for Map Reports. eURL is an add-on.	
220	R	Search and report on all fields in database, including user-defined fields, with ability to organize, summarize, sort, and sub-total in a variety of ways.	Y	Cityworks Search tool for Ad-hoc Search and Reports	Office, Field
221	Ι	Intuitive ad hoc query and reporting for users with wild card search and drop down lists. Search, sort, set report parameters (e.g. date ranges). Allows easy access to the data for report and query generation without the need for a programming specialist.	Y	Cityworks Search tool for Ad-hoc Search and Reports.	Office, Field
222	R	Reporting by date range and combinations of other parameters.	Y	Cityworks Search tool for Ad-hoc Search and Reports.	Office, Field
223	Ι	Customer-defined exception reporting.	N	Cityworks does not allow for custom system exception reporting.	
224	R	Save a query as a report on desktop or to a library in the system for re-use in future.	Y	Save Search.	Office, Field
225	Ι	Modify report templates or standard reports and save new format for use in the future.	Y	Crystal Report Templates.	Office, Field, and Crystal

226	Ι	Access reports through graphical dashboard display.	Y	Inbox uses saved searches for graphical reporting.	Office, Field, Respond
227	Ι	Executive Dashboard tailored to each user. Describe.	Y	Inbox user can have their own custom reports and searches.	Office, Field, Respond
228	N	Ability to integrate EAM dashboard parts into an Enterprise dashboard		Cityworks does not natively possess exportable dashboard capabilities; however, we will provide the necessary dashboard information from Cityworks via reporting.	
229	Ι	Ability to generate -, track and report on key performance indicators, accomplishments, variances, failures and issues.	Y	Cityworks Analytics is an Add-on application.	Cityworks Analytics
230	Ι	Built-in graph and charting capabilities.	Y	Inbox or Cityworks Analytics.	Office, Field, Respond, Cityworks Analytics
231	N	Drill down from report line item to detail transaction level.	Y	In a chart in Inbox you can Drill down 1 level to the Activity (SR, WO, Insp, etc) then open the activity and see everything inside.	Office, Field
232	N	Search on comments fields.	Y		Office, Field
233	Ι	Ability to report staff time across at least two dimensions: the activity performed and the project the activity was completed on.	Y	You would need to fill out the appropriate fields	Office, Field, Respond

Supplier Response Form BID/PROPOSAL CERTIFICATION

<u>Please Note:</u> If responding to this solicitation through BidSync, the electronic version of the bid response will prevail, unless a paper version is clearly marked **by the bidder** in some manner to indicate that it will supplant the electronic version. All fields below must be completed. If the field does not apply to you, please note N/A in that field.

If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit <u>http://www.dos.state.fl.us/</u>).

Company: (Legal Registration) Black & Veatch Corporation
Address: 2855 North University Drive, Suite 210
City: Coral Springs State: FL Zip: 33065
Telephone No. 754-229-3049 FAX No. N/A Email: friasre@bv.com
Delivery: Calendar days after receipt of Purchase Order (section 1.02 of General Conditions):
Total Bid Discount (section 1.05 of General Conditions):
Does your firm qualify for MBE or WBE status (section 1.09 of General Conditions): MBE WBE

<u>ADDENDUM ACKNOWLEDGEMENT</u> - Proposer acknowledges that the following addenda have been received and are included in the proposal:

Addendum No.	Date Issued	<u>Addendum</u>	<u>No.</u>	Date Issued	Addendum No.	Date Issued
M/A						

<u>VARIANCES</u>: If you take exception or have variances to any term, condition, specification, scope of service, or requirement in this competitive solicitation you must specify such exception or variance in the space provided below or reference in the space provided below all variances contained on other pages within your response. Additional pages may be attached if necessary. No exceptions or variances will be deemed to be part of the response submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDSYNC you must also click the "Take Exception" button.

selected, Black & Veatch will take the	
eps necessary to accept payments from the City via credit card	ı.

The below signatory hereby agrees to furnish the following article(s) or services at the price(s) and terms stated subject to all instructions, conditions, specifications addenda, legal advertisement, and conditions contained in the bid/proposal. I have read all attachments including the specifications and fully understand what is required. By submitting this signed proposal I will accept a contract if approved by the City and such acceptance covers all terms, conditions, and specifications of this bid/proposal. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a response, that in no event shall the City's liability for respondent's direct, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral

DPX Form

presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

Submitted by:

Brent Reuss Name (printed)	Brent Reuss Signature	
5/16/17 Date:	Vice President Title	

Please enter your password below and click Save to update your response.

Please be aware that typing in your password acts as your electronic signature, which is just as legal and binding as an original signature. (See <u>Electronic Signatures in Global and National Commerce Act</u> for more information.)

To take exception:

1) Click Take Exception.

2) Create a Word document detailing your exceptions.

3) Upload exceptions as an attachment to your offer on BidSync's system.

4

By completing this form, your bid has not yet been submitted. Please click on the place offer button to finish filling out your bid.

Username littlesz@bv.com

Password

Save Take Exception Close

* Required fields

SECTION VI – FEE PROPOSAL SUMMARY PAGE (See Form 2 for Fee Proposal Details)

Proposer Name: Black & Veatch Corporation

Proposer agrees to supply the products and services at the prices bid below in accordance with the terms, conditions and specifications contained in this RFP.

Cost to the City: Proposer must quote firm, fixed, costs for all services/products identified in this request for proposal. These firm fixed costs for the project include any costs for travel and miscellaneous expenses. No other costs will be accepted.

Notes: Attach a breakdown of costs including but not limited to labor, equipment, materials and parts. Include all cost under Item 1 below, add the letter in front of the dollar sign for the solution your are proposing. i.e. b. \$_____.

1.	a. Software (On-Premises City Hosted)	\$ <u>122,000.00</u>
	b. Software as a Service	\$
	a. Combination of Hosted and Service	\$
2.	Hardware	\$
3.	Implementation Cost	\$ <u>814,985.00</u>
4.	Training Cost	\$ <u>97,958.00</u>
5.	Additional Equipment/Material (List in Detail)	\$
6.	List and Explain Any Other Cost not Included	\$

Total Project Cost

\$ 1,034,943.00

Submitted by: Brent Reuss, PE Name (Printed)

Signature

<u>05/18/2017</u> _ Date Vice President Title

FORM 2: FEE PROPOSAL

INSTRUCTIONS

There are several pricing forms to be completed:

- 1. On-Premises City Hosted * (See 8 Below)
- 2. Hosted or Software-as-a-Service
- 3. Or a combination of the 1 and 2 above

If you only provide one option, please complete the applicable form. If you provide both options please complete both forms. Also note if there are any other options that you provide and complete an applicable form for those options.

	On-Premises City Hosted License Pricing			
1	Briefly describe your estimating approach and the basis for your proposed pricing.			
2	Briefly describe your fee structure for professional services.	Role – Hourly Rate Project Director - \$288 Project Controls – \$112 Project Manager - \$239 EAMS Lead - \$207 Developer/Integrator - \$179 EAMS Implementer - \$141 GIS Specialist - \$118 Admin - \$103		
3	Discuss how you will discount the software, maintenance/support and services rate for us.	Software is not being discounted but is a straight subscription fee provided by the software vendors		
4	Prices and rates must be locked in for three years.	Yes		
5	Provide a summary of costs excluded from this proposal	 All costs associated with the preparation of this proposal have been excluded. All costs associated with Phase 2 – treatment facilities implementation have been excluded. 		
6	Provide a preliminary payment schedule, keeping in mind that we are not allowed to pay for goods and services in advance. There is a retainer of 10% to be paid upon final acceptance by the City. Final acceptance: After go-live (the first production use of the software); the City will have 60 days to test the software in a production environment	 Payments will be invoiced monthly for professional services and reimbursable costs. 		

	and to develop a list of non-conforming corrected by the supplier. Final accepta when the City agrees in writing that all conforming elements have been correct minor or inconsequential errors.		
7	We own a site license for ESRI ArcGIS not plan to pay for additional licenses a acquisition. Can you honor that, and if	Yes	
8	acquisition. Can you honor that, and if not, why not? *List hardware and other any other software or items required for the City to host. Also suggest/recommend a backend server configuration with the amount and whether they are virtual or physical and the storage requirements.		 Recommended server architecture: 1 Development server – to be virtualized for multiple development environments 1 Testing/training server, 1 Application servers. 2 or more application servers may be required to achieve optimal performance 1 database server with application SQL Server and server operating systems 1 ArcGIS Server Server architecture may be virtualized.
	SOFTWARE LICENSE	\$	ASSUMPTIONS
Asse	SOFTWARE LICENSE	\$ \$102,000/yr.	ASSUMPTIONS Included with Cityworks
Asse Asse	SOFTWARE LICENSE t Record Tracking t Lifecycle Management	\$ \$102,000/yr. Included	ASSUMPTIONS Included with Cityworks Included with Cityworks
Asse Asse Parts	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks
Asse Asse Parts Preve	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks Included with Cityworks Assumes client has PM tasks itemized by assets and maintenance types
Asse Asse Parts Preve	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks Included with Cityworks Assumes client has PM tasks itemized by assets and maintenance types Included with Cityworks
Asse Asse Parts Preve Work	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling Management Order Billing	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks • Included with Cityworks • Assumes client has PM tasks itemized by assets and maintenance types Included with Cityworks Included with Cityworks and assumed to be adding costs for materials, labor, equipment and contractors to a work order.
Asse Asse Parts Preve Work Work	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling . Management . Order Billing orting	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks • Included with Cityworks • Assumes client has PM tasks itemized by assets and maintenance types Included with Cityworks Included with Cityworks and assumed to be adding costs for materials, labor, equipment and contractors to a work order. Included with Cityworks
Asse Asse Parts Preve Work Work	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling Management . Order Billing rrting ArcGIS integration	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks • Included with Cityworks • Assumes client has PM tasks itemized by assets and maintenance types Included with Cityworks Included with Cityworks and assumed to be adding costs for materials, labor, equipment and contractors to a work order. Included with Cityworks Included with Cityworks Included with Cityworks
Asse Asse Parts Preve Work Work Repo ESRI Other	SOFTWARE LICENSE t Record Tracking t Lifecycle Management /Supplies Inventory entive Maintenance/Scheduling and Management Corder Billing orting ArcGIS integration r: BV PlantWorks	\$ \$102,000/yr. Included Included	ASSUMPTIONS Included with Cityworks Included with Cityworks Included with Cityworks Included with Cityworks Assumes client has PM tasks itemized by assets and maintenance types Included with Cityworks Included with Cityworks and assumed to be adding costs for materials, labor, equipment and contractors to a work order. Included with Cityworks Included with Cityworks B&V add on to Cityworks to facilitate easy access to vertical (non-spatial) assets.

included in the core module price		
Sub-Total: Core Modules		
Optional: (Describe)		
Assetic Predictor	\$15,000/yr.	Advanced Asset Management Analysis
Sub-Total: Software License	\$122,000/yr.	
IMPLEMENTATION	\$	ASSUMPTIONS
Implementation	\$455,484	
Data Conversion	\$35,043	
Training	\$97,958	
Data Collection	NA	
Integration	\$211,478	
Customization	NA	
Travel Expenses	\$48,000	
Other: Project Management	\$64,980	
Sub-Total: Implementation	\$912,943	
Ratio: Implementation Cost to License Cost (E.g. 2:1)	6.8:1	
ANNUAL MAINTENANCE and SUPPORT	\$	ASSUMPTIONS
Year 1	\$122,000	
Year 2	\$122,000	
Year 3	\$122,000	
Year 4	\$122,000	
Year 5	\$122,000	
Year 6	\$125,660	Cityworks will need to confirm but escalated 3% for CPI. Estimate only.
Year 7	\$125,660	Cityworks will need to confirm but escalated 3% for CPI. Estimate only.
Year 8	\$125,660	Cityworks will need to confirm but

		escalated 3% for CPI. Estimate only.
Sub-Total: Maintenance & Support	\$986,980	Cityworks will need to confirm but escalated 3% for CPI. Estimate only.
Maintenance & Support Cost Calculation Formula (e.g. 18% of purchase price)	\$986,980	Cityworks will need to confirm but escalated 3% for CPI. Estimate only.
Include any Service Level Agreements and Terms		Included
GRAND TOTAL	\$1,899,923	License, Implementation, Eight (8) Years, Maintenance

	Hosted Or Software-as-a-Se	rvice (SAAS) Pricing
1	Are you proposing a Hosted or Software-as-a Service (SaaS) option? Briefly describe. You may attach a copy or be prepared to provide upon request.	
2	Briefly describe your estimating approach and the basis for your proposed pricing.	
3	Briefly describe your fee structure for professional services.	
4	Discuss how you will discount the subscription, maintenance/support and service rate.	
5	Prices and rates must be locked in for three years.	
6	Provide a summary of costs excluded from this proposal	
7	Provide a preliminary payment schedule, keeping in mind that we are not allowed to pay for goods and services in advance. We also require a hold back of 20% to be paid upon final acceptance by the City. Final acceptance: After go-live (the first production use of the software); the City will have 60 days to test the software in a production environment and to develop a list of non-conforming elements to be corrected by the supplier. Final acceptance will take place when the City agrees in writing that all of the non-conforming elements have been corrected except for minor or inconsequential errors.	
8	We own a site license for ESRI ArcGIS products and do not plan to pay for additional licenses as part of this acquisition. Can you honor that, and if not, why not?	
9	For the hosted or SaaS state the required average bandwidth per concurrent users (175/200)	

HOSTED/SAAS SUBSCRIPTION	ANNUAL SUBSCRIPTION \$	ASSUMPTIONS
Asset Record Tracking		
Asset Lifecycle Management		
Parts/Supplies Inventory		
Preventive Maintenance/Scheduling		
Work Management		
Work Order Billing		
Reporting		
ESRI ArcGIS integration		
Other: (Describe)		
List any optional modules required outside of the basic foundational modules not included in the core module price		
Sub-Total: Core Modules		
Optional: (Describe)		
Sub-Total: Annual Subscription		
Describe any commitments. E.g. Can we terminate at any time? Is there a 1 year commitment? Etc.		
SERVICE ELEMENTS	ANNUAL SUBSCRIPTION \$	ASSUMPTIONS
Infrastructure		
Equipment		
Telecommunications & Network		
Operations Support		
Client Environment Support		
Disaster Recovery		
Other: (Describe)		
Sub-Total: Annual Service Elements Subscription		
IMPLEMENTATION	\$	ASSUMPTIONS
Implementation		

Data Conversion	
Data Collection and Entry	
Data Review and Analysis	
Training	
Integration	
Customization	
Travel Expenses	
Other: (Describe)	
Sub-Total: Implementation	
Ratio: Implementation Cost to License Cost (E.g. 2:1)	
ANNUAL MAINTENANCE and SUPPORT	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware Other: (Describe)	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware Other: (Describe)	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware Other: (Describe) Sub-Total: Maintenance & Support	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware Other: (Describe) Sub-Total: Maintenance & Support Maintenance & Support Cost Calculation Formula (e.g. 10% of purchase price)	\$ ASSUMPTIONS
ANNUAL MAINTENANCE and SUPPORT Software Hardware Other: (Describe) Sub-Total: Maintenance & Support Maintenance & Support Cost Calculation Formula (e.g. 10% of purchase price)	\$ ASSUMPTIONS

If your hosted pricing does not fit into the format above, present it in a format that fits your model, but please present it in a format that is easy for us to understand.



Pricing Quotatio	n					
Quote Number 00002090			Created Date	Created Date 5/11/2017		
Contact Info						
Company Name City of Fort Lauderdale, Florida		Prepared By Phone Email	Dave Bramwell 801-617-8313 dbramwell@city	yworks.com		
Product Code		Product		Quantity	Sales Price	Total Price
CW.ELAAMSSTA	.Tier2A	ELA - Server AMS STA	ANDARD Tier 2A	1.00	\$90,000.00	\$90,000.00
CW.SUBSERVAPI.0001 Service Request		Service Request API		1.00	\$6,000.00	\$6,000.00

CW.SUBWOAPI.0001	Work Order API - Basic	1.00	\$6,000.00	\$6,000.00

Total Price	\$102,000.00
Grand Total	\$102,000.00

Support Period N	lotes and Amounts		
Support Notes #1	Year 1	Support Amount	\$102,000
Support Notes #2	Year 2	Support Amount	\$102,000
Support Notes #3	Year 3	Support Amount	\$102,000
Support Notes #4 Year 4-8: Fee will increase if the city grows into a higher pricing tier (>200,000). A CPI increase is possible (see license agreement)			

Notes

Quote Notes

Server AMS Standard Cityworks Enterprise License Agreement (ELA), Includes Unlimited Quantities of the Identified Products:

Office Field Respond Mobile Native Apps (for iOS/Android)

--Includes the following Add-ons:
Storeroom
Equipment Checkout
Contracts
Cityworks Analytics for AMS
Cityworks for Excel
eURL (Enterprise URL)
CCTV Interface for PACP
MicroPaver Interface
Service Request API
Work Order API - Basic
Local Government Templates (LGT)
Use of Cityworks AMS Application Programming Interfaces (APIs) with commercially available Cityworks-centric applications that are licensed and maintained by authorized Cityworks partners

Cityworks[®]

AZTECA SYSTEMS QUOTATION TERMS AND CONDITIONS COPYRIGHT 1995 - 2016

All quotations are valid for ninety-days (90) from the date above, unless otherwise stated in this quotation form. All prices quoted are in USD, unless specifically provided otherwise, above. These prices and terms are valid only for items purchased for use and delivery within the United States.

Unless otherwise referenced, this quotation is for the Cityworks software referenced above only. Pricing for implementation services (installation, configuration, training, etc.), or other software applications is provided separately and upon request.

The procurement, installation and administration of the Esri software utilized in conjunction with Cityworks will be the responsibility of the customer.

The procurement, installation and administration of the RDBMS utilized in conjunction with Cityworks will be the responsibility of the customer. Currently, Cityworks supports Oracle and SQL Server.

The procurement, installation and administration of the infrastructure (hardware and networking) utilized in conjunction with Cityworks will be the responsibility of the customer.

This quotation information is confidential and proprietary and may not be copied or released other than for the express purpose of the current system selection and purchase. This information may not be given to outside parties or used for any other purpose without written consent from Azteca Systems, LLC.

Order Process

The order process is initiated when Azteca Systems receives either a Purchase Order with invoicing instructions or some form of advance payment. Additional documents will be required including, the Cityworks Software License Agreement, Addendums to the software license agreement, and Cityworks Site Profile to complete your order. The need for these documents may vary by the type of software ordered or generally accepted industry practices. Please consult your Account Representative for assistance. If delivery must be expedited, please notify your Account Representative.

To expedite your order, please reference this quotation number.

Software Licensing

All Azteca Systems software offered in this quotation are commercial off-the-shelf (COTS) software developed at private expense, and is subject to the terms and conditions of the "Cityworks Software License Agreement" and any and all addendums or amendments thereto. A fully executed copy of the Software License Agreement and any addendum(s) is required before delivery and installation.

Delivery

FOB Sandy, UT 84070, USA.

Allow thirty-days (30) from Azteca System's receipt of the Purchase Order, signed Software License Agreement, Maintenance Addendum, and other documents, as required.

Delivery method is by way of download through Azteca Systems, LLC customer support web portal.

Payment Terms

Net thirty (30) days.

Taxes

Prices quoted do not include any applicable state, sales, local, or use taxes unless so stated. In preparing your budget and/or Purchase Order, please allow for any applicable taxes, including, sales, state, local or use taxes as necessary. Azteca Systems reserves the right to collect any applicable sales, use or other taxes tax assessed by or as required by law. Azteca Systems reserves the right to add any applicable tax to the invoice, unless proof with the order is shown that your organization or entity is tax exempt or if it pays any applicable tax directly.

Accepted by:

Title

____/___/____ Date

Supplier Response Form

NON-COLLUSION STATEMENT:

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.

NAME	RELATIONSHIPS
- N/A	N/A

In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.

Please enter your password below and click Save to update your response.

Please be aware that typing in your password acts as your electronic signature, which is just as legal and binding as an original signature. (See <u>Electronic Signatures in Global and National Commerce Act</u> for more information.)

To take exception:

1) Click Take Exception.

2) Create a Word document detailing your exceptions.

3) Upload exceptions as an attachment to your offer on BidSync's system.

*

By completing this form, your bid has not yet been submitted. Please click on the place offer button to finish filling out your bid.

Username littlesz@bv.com

Password

Save Take Exception Close

* Required fields

Supplier Response Form CONTRACT PAYMENT METHOD BY P-CARD

THIS FORM MUST BY SUBMITTED WITH YOUR RESPONSE

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City has transitioned from traditional paper checks to payment by credit card via MasterCard or Visa. This allows you as a vendor of the City of Fort Lauderdale to receive your payment fast and safely. No more waiting for checks to be printed and mailed.

Payments will be made utilizing the City's P-Card (MasterCard or Visa). Accordingly, firms must presently have the ability to accept credit card payment or take whatever steps necessary to implement acceptance of a credit card before the commencement of a contract.

Please indicate which credit card payment you prefer:

Master Card

□ Visa Card

Company Name: Bla	ck & Veatch Corporation		
Brent Reuss Name (Printed)		Brent Reuss Signature	
5/16/17		Vice President	
Date:		Title	

Please enter your password below and click Save to update your response.

Please be aware that typing in your password acts as your electronic signature, which is just as legal and binding as an original signature. (See <u>Electronic Signatures in Global and National Commerce Act</u> for more information.)

To take exception:

1) Click Take Exception.

2) Create a Word document detailing your exceptions.

3) Upload exceptions as an attachment to your offer on BidSync's system.

By completing this form, your bid has not yet been submitted. Please click on the place offer button to finish filling out your bid.

Username littlesz@bv.com

DPX Form

Password

Save Take Exception Close

*

* Required fields



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 5/9/2017

I

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.							
IMPORTANT: If the certificate holder the terms and conditions of the policy, certificate holder in lieu of such endor:	is an AD , certain sement(s	DITIONAL INSURED, the policies may require an en	policy(Idorsei	ies) must be ment. A stat	e endorsed. tement on th	If SUBROGATION IS WAIVED is certificate does not confer r	, subject to ights to the
PRODUCER		<i>r</i>	CONTAC	CT Patrick M	loss		
Lockton Companies			PHONE	Ext): (816) 96	60-9675	FAX (A/C, No):	
444 W. 47th Street, Suite 900			E-MAIL	SS:		1,410,110,	
Kansas City MO 64112-1906				INS	URER(S) AFFOR		NAIC #
			INSURE	RA: Zurich A	merican Insu	rance Company	16535
INSURED			INSURE	кв: America	n Zurich Insu	rance Company	40142
Black & Veatch Corporation			INSURE	R c : Lexingto	on Insurance	Company	19437
Overland Park, KS 66211			INSURE	RD:			
United States			INSURE	RE:			
		220404	INSURE	RF:			
COVERAGES CER	TIFICAT	E NUMBER: 338184				REVISION NUMBER:	
THIS IS TO CERTIFY THAT THE POLICIES INDICATED. NOTWITHSTANDING ANY RE CERTIFICATE MAY BE ISSUED OR MAY EXCLUSIONS AND CONDITIONS OF SUCH	OF INSU QUIREMI PERTAIN, POLICIES	RANCE LISTED BELOW HAV ENT, TERM OR CONDITION THE INSURANCE AFFORDE I. LIMITS SHOWN MAY HAVE I	/E BEE OF ANY ED BY BEEN R	N ISSUED TO CONTRACT THE POLICIES REDUCED BY	OR OTHER I OR OTHER I S DESCRIBEI PAID CLAIMS.	D NAMED ABOVE FOR THE POL DOCUMENT WITH RESPECT TO D HEREIN IS SUBJECT TO ALL	ICY PERIOD WHICH THIS THE TERMS,
LTR TYPE OF INSURANCE	INSD WV	POLICY NUMBER		(MM/DD/YYYY)	(MM/DD/YYYY)	LIMITS	000.000
		GLO 0139245 – Large		11/1/2016	11/1/2017	EACH OCCURRENCE \$ \$1, DAMAGE TO RENTED \$ \$20	000,000
A X Contractual		GLO 4641367 – Divisiona	al	11/1/2016	11/1/2017	PREMISES (Ea occurrence) \$ \$30	0,000
X PD & C/O & XCU	v	Works				MED EXP (Any one person) \$ \$10	000.000
	^	GLO 4641358 - Corporat	e			GENERAL AGGREGATE \$ \$2	000,000
							000.000
						\$,
		BAP 4641355		11/1/2016	11/1/2017	COMBINED SINGLE LIMIT	000.000
X ANY AUTO				11/1/2010	11/1/2011	BODILY INJURY (Per person) \$,
X ALL OWNED SCHEDULED						BODILY INJURY (Per accident) \$	
X HIRED AUTOS X NON-OWNED						PROPERTY DAMAGE \$	
						\$	
UMBRELLA LIAB OCCUR						EACH OCCURRENCE \$	
EXCESS LIAB CLAIMS-MADE						AGGREGATE \$	
DED RETENTION \$						S OTH	
A WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N		WC 0139244		11/1/2016	11/1/2017	X STATUTE ER	
B OFFICER/MEMBER EXCLUDED?	N/A	N/A WC 4641354 (ID, MA, W WC 4641353 (AOS)		11/1/2016	11/1/2017	E.L. EACH ACCIDENT \$ \$1,	000,000
(Mandatory in NH) If yes, describe under						E.L. DISEASE - EA EMPLOYEE \$ \$1,	000,000
DESCRIPTION OF OPERATIONS below		026030198		11/1/2016	44/4/0047	E.L. DISEASE - POLICY LIMIT \$ 91, Professional Limit Each Claim and	Annual Aggregate
		02000100		11/1/2016	11/1/2017	Limit: \$2,000,000)
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required) Project #: 907995.0000; Project Name: Fort Lauderdale, FL (CMMS Evaluation and Implementation); Project Manager/Contact: Seastead, Mark							
			CANO				
City of Fort Lauderdale Procurement Services Division 100 N. Andrews Avenue Room 619 Fort Lauderdale, FL 33301 United States			SHO THE ACC	ULD ANY OF EXPIRATION ORDANCE WI		ESCRIBED POLICIES BE CANCELI REOF, NOTICE WILL BE DE Y PROVISIONS.	LED BEFORE LIVERED IN
					y	of MApelle	
ACORD 25 (2014/01)	The A	ACORD name and logo ar	e regis	© 19 stered marks	88-2014 AC s of ACORD	ORD CORPORATION. All rig	hts reserved.



ADDITIONAL REMARKS SCHEDULE

AGENCY	NAMED INSURED
Lockton Companies 444 W. 47th Street, Suite 900 Kansas City MO 64112-1906	Black & Veatch Corporation 11401 Lamar Overland Park, KS 66211 United States
	EFFECTIVE DATE: 11/1/2016

ADDITIONAL REMARKS

THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,

FORM NUMBER: 25 FORM TITLE: Certificate of Liability Insurance

Additional Wording: The Professional Liability Policy is issued for informational purposes until contract award.

Upon award of contract, City of Fort Lauderdale will be included as an Additional Insured as applicable and required by executed, written contract on the following policies: General Liability





FLORIDA DEPARTMENT OF STATE Sandra B. Mortham Secretary of State

December 22, 1998

CT SYSTEM ATTN: HOPE

Qualification documents for BLACK & VEATCH CORPORATION were filed on December 22, 1998 and assigned document number F98000006965. Please refer to this number whenever corresponding with this office.

Your corporation is now qualified and authorized to transact business in Florida as of the file date.

A corporation annual report will be due this office between January 1 and May 1 of the year following the calendar year of the file date. A Federal Employer Identification (FEI) number will be required before this report can be filed. If you do not already have an FEI number, please apply NOW with the Internal Revenue by calling 1-800-829-3676 and requesting form SS-4.

Please be aware if the corporate address changes, it is the responsibility of the corporation to notify this office.

Should you have any questions regarding this matter, please telephone (850) 487-6091, the Foreign Qualification/Tax Lien Section.

Lee Rivers Document Specialist Division of Corporations

Letter Number: 998A00060077



CERTIFICATE OF OFFICER

I, Timothy W. Triplett, the President and Secretary of BLACK & VEATCH CORPORATION, a corporation duly organized and existing under the laws of the State of Delaware, United States of America, certify that the following is a true excerpt of a certain resolution of said Board of Directors of BLACK & VEATCH CORPORATION, which resolution was duly adopted on March 10, 2003, and that said resolution has not been rescinded or modified, is in accordance with the charter and by-laws of the corporation, and is still in full force and effect.

RESOLVED, any note, mortgage, evidence of indebtedness, contract, share certificate, conveyance, power of attorney, or other instrument in writing and any assignment or endorsements thereof, or guarantee of any other entity's performance under any such executed document, entered into between this corporation and any other person or company shall be valid and binding on this corporation, when signed by either the Chairman of the Board, the President or any Vice President, and, if attestation is required, by either the Secretary, Assistant Secretary, Chief Financial Officer, Treasurer or any Assistant Treasurer of this corporation. Any such instruments may be signed by any other person or persons in such manner as from time to time shall be determined by the Board.

I further certify that the individual named below is an officer of the company holding the titles indicated and have signature authority to sign, seal, deliver, negotiate, accept and enter into agreements, contracts and other instruments or documents by and on behalf of the Company.

Brent M. Reuss Vice President

IN WITNESS WHEREOF, I have hereunto set my hand and attached the corporate seal of BLACK & VEATCH CORPORATION this 12- day of May 2017.



STATE OF KANSAS

COUNTY OF JOHNSON

Subscribed and sworn to before me this 📝 day of May 2017, by Timothy W. Triplett as President & Secretary of Black & Veatch Corporation.

JOTARY PUBLIC	KERRI TRIPP
Contin	My Annt Evil 24/20
STATE OF KANSAS	my report the



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Rafael E. Frias, P.E	. 1
Mark Thomas Seastead	. 3
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Ricardo Jose Vieira, P.E.	. 7
Walt Schwarz, P.E	. 9
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Rafael E. Frias, P.E.

Mr. Frias serves as a Client and Project Director with the global water business of Black & Veatch Corporation and is responsible for the management of the Company's operations in Florida and the Caribbean. Mr. Frias specializes in the management of water resources projects, including water supply, water treatment, hydropower and stormwater planning and design. Mr. Frias is also experienced in incorporating sustainability principles into project designs and in the development of sustainable water planning technologies for the management of watersheds and ecosystems, water scarcity and wet-weather conditions. He is a national Board member of the American Water Resources Association, and an active member of the Water Environment Federation and American Water Works Association, for which he has published papers and delivered presentations on comprehensive water resources issues, including sustainable water planning, surface water management, water treatment technologies, aquifer storage and recovery and small hydropower.

Some of Mr. Frias' key recent assignments and experience include:

- Development of a comprehensive Energy Efficiency Master Plan for the City of Hollywood, Florida.
- Project management for dam failure studies and seismic evaluations in Puerto Rico.
- Program Management/Construction Management for implementation of a \$455 million Capital Improvement Program in Puerto Rico.
- Project management for chemical facilities at a water treatment plant.
- Experience using of surface water and groundwater modeling applications including HEC-1, HEC-HMS, HEC-GeoHMS, HEC-RAS, HEC-GeoRAS, XP-SWMM, ICPR, TR-55, EPANET, processing MODFLOW, PLUMES, ArcGIS and project scheduling applications, including Primavera P3e/c and Microsoft Office Project.

PROJECT EXPERIENCE

Palm Beach County Water Utilities Department | Sustainability and Strategic Planning Services; Palm Beach County, FL

Project Director. Currently, leading Black & Veatch's efforts for the development of a Strategic Sustainability Plan (SSP) for PBCWUD to shape the future state of the utility and support it in continuing to be a leader in the water and wastewater utility industry. As part of the SSP, Black & Veatch is using our Pathfinder strategic planning process, which was developed based on our proven experience working with clients within the water and energy industries. The Pathfinder methodology uses a collaborative approach to meld bottom-up initiatives with top-down strategic intent. The methodology combines sustainability, financial, and operational analytics with technical depth and insights for development of the PBCWUD SSP. Sustainability planning for PBCWUD's SSP considers the Institute of



PROJECT DIRECTOR

Expertise:

Stormwater Systems; Water Resources; Water Treatment Systems

Education

- ME, Civil Engineering, Civil/Environmental/ Management, University of Kansas
- BS, Environmental Engineering, Biological Engineering, Louisiana State University

Professional Registration

- PE 24726, PR (U.S.), 2011
- PE 61219, FL, 2009
- PE -17469, KS, 2008

Total Years of Experience 18

Years of Experience with B&V 18

Professional Associations

- WateReuse Florida
- Water Environmental
- FederationAmerican Water Works Association
- American Water Resources Association - Board Member

Office Location Coral Springs, FL Sustainable Infrastructure's (ISI) Envision rating system, which covers all infrastructure aspects, including water and wastewater facilities.

Black & Veatch is also supporting PBCWUD with the developing an asset management strategy for the 2014-19 strategic sustainability planning process. The overall strategy will consider the complete life cycle of assets and focus on improving the utility's management systems around People, Processes and Assets. For this, the PAS 55 management framework will be followed, with the vision of achieving an ISO 55001 compliant management system for the utility.

Miami-Dade Water and Sewer Department (MDWASD) | Hydraulic Modeling in Support of Planning Activities; Miami, FL

Project Director. Black & Veatch is currently performing multiple capacity studies initiated by the Miami-Dade Water & Sewer Department's (Department) Planning Division. The services being performed include: Water and Wastewater Capacity Analyses Orientation; Water Hydraulic Model Operation and Maintenance using the Department's existing distribution system model (InfoWater); and Collection System Capacity Analyses using the Department's existing collection system model (Infoworks CS).

Puerto Rico Aqueduct and Sewer Authority (PRASA) | East Region CIP Program Management Consortium; Puerto Rico (U.S.)

Principal in Charge. Leading Black & Veatch's Program Management Consortium (PMC) for PRASA's fastest growing east region. As a PMC, Black & Veatch's role consists of managing a program for the implementation of critical water and wastewater infrastructure projects that involve planning, design, construction oversight, inspection of utility assets and commissioning of facilities. The Black & Veatch team currently has 30 projects ongoing at various stages representing \$250 million of capital investment. Projects include wastewater treatment plant (WWTP) improvements, such as grit removal, emergency generator enhancements and sewer rehabilitation, as well as improvements to the potable water treatment system.

The Black & Veatch team is working for the Puerto Rican people, providing the most necessary infrastructure services needed for a community -- safe, reliable drinking water and effective and efficient sewer service.

Puerto Rico Aqueduct and Sewer Authority (PRASA) | Lago Cidra Dam and Candelas Pump Station Rehabilitation; Puerto Rico (U.S.)

Principal in Charge. During the past five years, evaluations of the Lago Cidra Dam and Candelas Pump Station (PS) revealed varying degrees of deterioration within the mechanical and electrical components of each facility. Significant rehabilitation efforts are required to restore these facilities to acceptable operation. Responsible for the successful preparation of preliminary and final design documents for the rehabilitation of the Lago Cidra Dam Wet Well and Dry Well and Candelas Pump Station. Design services include civil-structural improvements, hydro-mechanical equipment, electrical and instrumentation and controls, as well as bid phase and construction phase services.

Mark Thomas Seastead

Mr. Seastead is the East Region Practice Leader for Asset Management that supports Black & Veatch's Water Division. He has over 20 years of program management, consulting, and system implementation and integration experience on projects for private entities, municipal government and water, wastewater, and transportation focused clients. He specializes in work and asset management program development, CMMS solution selection, business process mapping, systems implementation and refinement, systems integration, and end user training and support. Having led both large enterprise and small departmental efforts to both private and public sector clients, Mr. Seastead provides a unique experience in leading asset management and IT program development that focuses on practical usage measurable performance.

PROJECT EXPERIENCE

Jackson Energy Authority | EAMS Implementation; Jackson, TN

Asset Management Lead. This project is assisting the JEA Water and Sewer Departments with the implementation of a new Cityworks EAMS. Services include defining key business processes, asset hierarchy development, system configuration, integration with JEA CRM, testing, and system support. When completed the system will support field operations and maintenance of water and wastewater systems managed by JEA and provide them with real-time work and asset management performance, more effective work planning, and compliance for federally mandated wastewater asset management.

Salt Lake City | EAMS Implementation - Phase 2; Salt Lake City, UT

Project Manager. Leading the full implementation of an enterprise asset management system for the Salt Lake City Water Reclamation Facility (SLCWRF). This included developing an asset hierarchy, inventorying assets, defining business processes associated with maintenance management, EAMS system configuration, end user training and support. This project also includes integration with the GE Proficy iFix and iHistorian SCADA system.

City of Rock Hill | EAMS Implementation; Rock Hill, SC

Project Director - GHD, Inc. Leading tasks associated with Cityworks upgrade, support and expansion. Upgrade from a desktop environment into a Cityworks Server AMS environment; creating custom training materials and "cheat sheets" for quick reference and the training of key staff.

Charlotte Area Transportation Services | Work and Asset Management Program; Charlotte, NC

Project Director - GHD, Inc. As a Project Director and Senior Technical Consultant leading effort to implement a CMMS and asset management program for facilities management to meet federal MAP-21 requirements. This project requires development of a CMMS capable of tracking and managing work for 13 facilities and all light rail platforms and bus stops throughout Mecklenburg County.



PROJECT MANAGER

Expertise:

Asset Management; Business Process; CMMS; EAMS; GIS; IT Strategic Planning

Education

- MS, Resource Planning, Missouri State University
- BS, Geology, The State University of New York at Fredonia

Total Years of Experience 21

Years of Experience with B&V 1

 Professional Associations
 American Water Works Association

Office Location Charlotte, NC

City of Charlotte DOT | EAMS Implementation; Charlotte, NC

Project Manager. This project is migrating CDOT from Hansen to Cityworks Enterprise Asset Management (EAM). Mr. Seastead is leading existing business process mapping, asset hierarchy development, requirements gathering for integration with the City's CRM program along with configuration, testing, and training. The results of this effort will be a fully implemented EAMS compliant with the rest of the City, improved business processes, and deployed EAMS to over 100 new users.

City of Greenville | EAMS Training; Greenville, SC

Project Manager. This project provides ongoing EAMS training on the Cityworks platform for Public Works users. Mr. Seastead is also leading asset management workshops to gather requirements for system expansion, document business processes to be incorporated into the EAMS and provide an implementation plan for system expansion.

Unified Port District of San Diego | Phase 2 Enterprise Asset Management Program; San Diego, CA

IT Technical Lead. This project is building upon the Phase 1 initiative that Mr. Seastead while employed by another company. Mr. Seastead is leading requirements gathering, business process mapping and conceptual architecture design for a new Enterprise Asset Management System (EAMS). This includes defining requirements, preparing an RFP for system selection and assisting the client with selecting, procuring and implementing the EAMS. The results of this effort will be a new EAMS that integrates with the existing SAP ERP system and deployed to over 150 new users with mobile technology.

Forsyth County | EAMS/CMMS Selection; GA

Asset Management Advisor. This project is assisting the Water and Sewer Department with the creation of a CMMS selection RFP. Services include defining system requirements, assistance with development of RFP language, demonstration script development, RFP evaluation ranking criteria, and assisting client with submittal evaluations and system selection.

City of Rock Hill | CMMS Support - Facilities Management; Rock Hill, SC

Project Manager. This project is assisting the City with implementing a facilities management focused computerized maintenance management system (CMMS). Services include defining key business processes and leading the system configuration, testing, training and support for the client.

Winston-Salem Forsyth County Utilities Commission | EAMS Planning; Winston- Salem, NC

Project Manager - GHD, Inc. As Project Director, Mr. Seastead oversaw an initial study that assessed the feasibility and identified needs associated with implementing an Enterprise Asset Management System (Cityworks). This study addressed data migration, GIS development, high level asset management needs, and provided recommendations to migrate select data that exists in IBM Maximo CMMS information into Cityworks.

City of Columbia | Metro Wastewater Treatment Plant EAMS Implementation; Columbia, SC

Project Manager - GHD, Inc. Project manager in charge of overseeing the successful implementation of Cityworks Server AMS within the plant environment. Responsibilities included management and deployment of a small-scale pilot, facilitating business process workshop, asset register and geodatabase development and validation, Cityworks system design and configuration, end-user training, and go-live support.

Bryan W Dickerson, GISP

Mr. Dickerson is a Regional Practice Leader for Asset Management and the National Lead for Asset Management Information Solutions supporting Black & Veatch's Water Division. He has over 20 years of program management, consulting, and system implementation and integration experience on projects for municipal government and water, wastewater, and stormwater utilities clients. He specializes in asset management program development utilizing ISO 55000 and PAS 55 guidelines, CMMS solution requirements development, systems implementation and refinement, web and mobile application development, and systems integration. Having led organizations in both the private and public sector, Mr. Dickerson provides a unique experience in leading asset management and IT programs both from the consultant and client perspectives.

PROJECT EXPERIENCE

City of Topeka | Water Treatment Plant Facility Master Plan; Topeka, KS

Asset Management and Information Systems Lead. Responsible for leading asset management and information solutions tasks in the development of a water treatment plant master plan. Originally constructed in 1923, the 22 mgd water treatment facility required a comprehensive master plan for the prioritization of rehabilitation and replacement projects. Led the development of condition assessment methodology, configuration of City's existing asset and maintenance management solution (Cityworks) to support inspection activities, and integration of inspection data into overall asset management strategy, risk and capital prioritization frameworks resulting in an objective, risk based prioritization of capital projects for the water treatment plant.

Utilities, Inc. | CMMS Evaluation, Selection, and Implementation; Northbrooke, IL

Asset Management and Information Systems Lead. Responsible for leading the evaluation of requirements for, potential solutions, selection, and implementation of Computerized Maintenance Management Solution for private water and wastewater utility operating regionally within fifteen states. Project involves requirements definition, system analysis, and development of system implementation and client resourcing plans for the implementation and management of CMMS for all regions and business units.

City of Grand Rapids | 2015 Comprehensive Master Plan Update; Grand Rapids, MI

Asset Management Consultant/Information Systems Lead. Responsible for technical coordination and execution of asset management activities for project. Project involved ISO 55001 assessment, review of existing Cityworks and Maximo Enterprise Asset and Maintenance Management Systems, development of overall asset management strategy for water distribution, wastewater collection, wastewater treatment plant, and Lake



EAMS

Expertise:

Asset management program development (ISO 55000, PAS 55), Agile application design and development, CMMS and **GIS** solution implementations including: Requirements Analysis, Implementation Consulting, Systems Integration and Project Management Services for Engineering Firms, Utilities, Municipalities and Governmental Agencies

Education

 BS, Geography, Northwest Missouri State

Total Years of Experience 21

Years of Experience with B&V

Professional Associations

- Water Research
- FoundationWater Environmental
- Water Environmental Federation
 AWWA Strategic
- Management Practices Committee
- American Water Works
 Association

Office Location Kansas City, MO Michigan Filtration Plant, and creation of asset management plan for water distribution system. All asset management activities aligned with development of comprehensive 5-year master plan for all utilities.

City of Mesa | Asset Management Master Planning for Signal Butte Water Treatment Plant; Mesa, AZ

Asset Management and Information Systems Lead. Responsible for leading development of asset management strategy and assessment of various Computerized Maintenance Management Systems to support operations and maintenance activities at the new Signal Butte Water Treatment Plant. Project involved definition of functional requirements for utility-wide asset and maintenance management system, vendor comparisons, and implementation planning and support. Subsequent phases of the project are currently underway and include implementation and integration of the selected CMMS platform (Cityworks).

Overland Park, Kansas

Deputy Chief Information Officer. Led diverse staff in the support of 24/7/365 IT operations. Ensured infrastructure, enterprise applications, and software development efforts aligned with operational needs and executive leadership team vision and strategy. Liaised with City Manager's Office and Governing Body on technology initiatives and policy development.

Woolpert, Incorporated

Project Director - Woolpert, Inc. Enterprise Asset Management System (EAMS) for Miami-Dade Water and Sewer Department. Led the development of asset management program for Water and Sewer Department including business process re-engineering; change management; implementation of Infor EAM; integration with Esri GIS, PeopleSoft ERP and Oracle Customer Care and Billing; and development of numerous mobile solutions for maintenance personnel. EAMS program involved management of water distribution, wastewater collection, water production, wastewater treatment, pump station maintenance, general (facilities) maintenance, fleet maintenance, and 311 center infrastructure assets and functions.

Project Manager and Technical Lead - Woolpert, Inc. Willows Water District Cityworks Implementation. Led the design and implementation of Azteca Cityworks for the management of asset information for all water utility-related assets and associated maintenance activities. Configured Cityworks to support customer service request functions and integrated with an existing financial system for update of employee-related information in Cityworks.

Project Manager and Technical Lead - Woolpert, Inc. Cityworks Implementation for Fort Collins Department of Transportation. Led the design and implementation of Azteca Cityworks as the CMMS for the management of signs, signals, pavement, communications (fiber), and pavement assets as well as associated parts/materials inventory. Integrated with the City's existing JD Edwards financial management system. The system was also integrated with the City's PeopleSoft ERP system for auto-generation of employee information and work order cost updates.

Brown & Caldwell, ESRI

Project Manager - Brown & Caldwell, ESRI. Previous experience includes enterprise GIS design and development, software application design and development, and implementation of numerous CMMS solutions integrating with GIS and Document Management systems for water distribution, wastewater collection, and treatment environments

Ricardo Jose Vieira, P.E.

Mr. Vieira has experience in leading and completing design management, program management, project management, and task management for water, wastewater, reclaimed, and storm-water transmission and conveyance projects in urban environments. Experience includes preparing and leading multiple preliminary engineering reports, construction documents, design-build criteria packages, design specifications and plans; permitting, operations and maintenance manuals, project tracking and management. His experience brings together all elements of the design process into a single coordinated effort.

Mr. Ricardo's experience also includes the design of roadway improvements, storm drainage systems, site development projects, and modeling and transient analysis.

PROJECT EXPERIENCE

West Harris County Regional Water Authority (WHCRWA) | Surface Water System Planning; West Harris County, TX

Project Coordinator. WHCRWA contracted with LAN to identify feasible alternatives and determine the cost of treatment and transmission of surface water to customers currently using groundwater. Mr. Vieira used GIS software to analyze historic groundwater production; summarize census tract population, water use, and demand by geographic areas; and to calculate and assign water demand to nodes in a hydraulic model of the surface water distribution system.

Miami-Dade Water and Sewer Department | Design-Build Criteria for the Government Cut 20-inch Water Main and 54-inch Force Main Replacement; Miami, FL

Project Coordinator. Mr. Vieira was part of the design team developing design-build criteria package for the replacement of the existing 54-inch force main that runs from Miami Beach to the Central District Wastewater Treatment Plant (CDWWTP) and for the replacement of the existing 20-inch water main from Port Island to Fisher Island. This project involved the horizontal and vertical alignments, identification of land rights and properties affected by the alignment, recommendation method of construction and details of water main replacement, project schedule through construction and opinion of probable construction costs, assist MDWASD through the procurement process, selection of design-build team and negotiations and provide limited construction management support to MDWASD in responding to RFIs, reviewing shop drawings, change orders and claims, and site visits and/or inspections.



ASSET MANAGEMENT

Expertise:

Seller-Doer asset management condition assessment Pipeline design rehabilitation point repairs

Education

 BE, Structural, Universidad Central de Venezuela

Professional Registration
PE - Civil - 73166, FL, 2016

Total Years of Experience

Years of Experience with B&V 1

Professional Associations

- Water Environment Federation
- Florida Water Environment Association
- ASCE/ASCE Palm Beach -FAU Practitioner, Advisor, Committee Chair
- American Water Works Association

Office Location Coral Springs, FL

Miami-Dade Water and Sewer Department | 54-inch Water Main Limited Manned Entry and Field Observations; Miami, FL

Project Manager. Involved in the preparation of condition assessment report for a 54-inch carbon fiber repairs located along Red Road Ave that transfers water from the John E. Preston Treatment Plant to the City of Hialeah and other areas of North Miami-Dade County. Mr. Vieira performed a limited manned entry assessment of the pipeline's internal condition. The condition assessment portion included a total of 12 pipe sections and had the following tasks: visual inspection of carbon fiber repairs and soundings to asses existing conditions, identify deficiencies, recommend an approach for rehabilitating distressed sections of line.

Miami-Dade Water and Sewer Department | 96-inch Raw Water Main Limited Manned Entry and Field Observations; Miami, FL

Project Manager. Involved in the site visit during the rehabilitation of the pipe-line, performed a limited manned entry assessment of the pipeline's internal condition, and performed a quality assurance review of the ongoing CFRP efforts of this raw water line.

Miami-Dade Water and Sewer Department | 72-inch Force Main Design Build Criteria Package; Miami-Dade County, FL

Project Manager. Pipeline Rehabilitation/Replacement Basis of Desigm Report and Design Criteria Package. Mr. Vieira provided recommendations for a pipeline rehabilitation method(s), along with the preparation of the Design-Build Criteria Package for the selected alternative. He provided support and assistance to MDWASD for the Request of Proposals and presented the criteria package at the pre-bid meeting. He is assisting the County during selection process of contractor of the

replacement/rehabilitation of the 72-inch force main Interceptor, approximately 3.5 miles long which conveys wastewater along NW/NE 159th Street to the North District Wastewater Treatment Plant. Mr. Vieira will also provided an orientation workshop to the evaluation committee.

Miami-Dade Water and Sewer Department | Evaluation of HDD Alternatives to Replace the Existing 54-inch Force Main Traversing the Government Cut Channel, MDWASD, FL; Miami-Dade County, FL

Task Leader. Task Leader for the evaluation of a 9,000 LF dual bore 42-inch-diameter HDD alternative for replacing the existing 54-inch sanitary sewage force main between Miami Beach and Virginia Key, and 3,300 LF of 36-inch HDD between Fisher Island and Miami Beach.

City of Houston | 156-inch Northeast Water Transmission Line Partnership Feasibility Study; Houston, TX

Task Leader. Mr. Vieira focused on a Phase I Preliminary Design for approximately 11 miles of diameters ranging from 72 to 156-inch water transmission lines. The routing included evaluations of existing and proposed easements and TxDOT crossings. The primary objectives of the analysis considered improving water system pressures, decommissioning groundwater plants, and providing additional surface water to the ETJ areas of the City of Houston.
Walt Schwarz, P.E.

Mr. Schwarz has more than 40 years of professional consulting experience covering a broad spectrum of civil engineering projects. Project fields include water supply, treatment, pumping, distribution, and storage; wastewater collection, transmission, pumping, and treatment; solid waste planning and management; roadway planning, design, and construction; and environmental analysis and site remediation. Mr. Schwarz is also experienced in managing large design teams and coordinating multiple efforts within a Capital Improvement Program (CIP).

PROJECT EXPERIENCE

City of Fort Lauderdale | WaterWorks 2011 Water and Wastewater Infrastructure Program; Fort Lauderdale, FL

Program Design Manager/Chief Engineer. Responsible for the planning and execution of all design work for \$690 million in utility system improvements. Position involved managing three consultant design teams and one city design team, more than 300 design projects, development of standards, design policies, and specifications, development and implementation of the 10-year CIP, coordination of improvements with downtown development projects, and all functional aspects of the city engineer. Provided design management and construction phase services for multiple projects, as well as value engineering for the gravity sewer component that saved the client over \$11 million.

City of Fort Lauderdale | WaterWorks 2011 Water and Wastewater CIP; Fort Lauderdale, FL

Program Management Team Design Manager and Chief Engineer.

Provided design management and construction phase services for the award-winning \$690 million construction program consisting of upgrading 40 percent of the City's sanitary sewer system from septic to gravity sewer, replacing significant portions of the water distribution system, construction of a membrane water treatment plant (WTP), and upgrades to the wastewater treatment plant (WWTP). Also provided value engineering for the gravity sewer component that saved the client more than \$11 million. Managed three consultant design teams and one city design team, more than 300 design projects, development of standards, design policies and specifications, development and implementation of the 10-year CIP, and coordination of improvements with downtown development projects.

City of Fort Lauderdale | A1A Force Main; Fort Lauderdale, FL

Project Manager. Responsible for the planning, design, and construction of 11,000 linear feet of a 24-inch force main, including a directionally drilled crossing of the Intracoastal Waterway.



Expertise:

Planning and Program Management; Water Water and Wastewater Conveyance Technology;

Education

- MS, Civil Engineering, University of Massachusetts
- BS, Civil Engineering, University of Delaware

Professional Registration

 PE - 45045, FL, 1992; NY, 1987; CT, 1985; MA, 1982; NH, 1982; VT, 1982

Total Years of Experience 43

Professional Associations

- American Society of Civil Engineers
- American Water Works
 Association
- Water Environment Federation

Office Location Ft. Lauderdale, FL

City of Fort Lauderdale | Sanitary Sewer and Lift Station; Fort Lauderdale, FL

Project Manager. Project manager for the planning, design, and construction of 40,000 linear feet of sanitary sewer and three lift stations; design and construction for the rehabilitation of 12,000 linear feet of 24-inch force main using trenchless methods; and design and reconstruction of a 5-mgd master pump station.

City of Fort Lauderdale | Effluent Pump Station Replacement Project; Fort Lauderdale, FL

Project Manager. Project manager for the planning, design, and construction of the 120-mgd plant effluent pump station replacement project at the G.T. Lohmeyer WWTP, including modifications to the control, electrical, and valving components.

Florida Keys Aqueduct Authority (FKAA) | Cudjoe Regional Wastewater Program; Florida Keys, FL

Program Manager/Engineering Manager. Engineering manager for the construction phase of an AWT WWTP, six master pump stations, more than 30 miles of transmission force main, and hybrid collection systems with pump stations on six islands. Prior to this project, served as project engineer to determine if an abandoned water main could be used as a sleeve for the installation of a new force main in Florida Department of Transportation (FDOT) right of way. Also evaluated potential technologies, obtained cost proposals, and monitored inspection activities.

Florida Keys Aqueduct Authority (FKAA) | District G Water Main Upgrades; Florida Keys, FL

Project/Design Manager. Project and design manager for the replacement of water mains concurrent and coordinated with the City of Key West sewer replacement in the same project area.

Florida Keys Aqueduct Authority (FKAA) | Cudjoe Key Pipe Condition Assessment; Florida Keys, FL

Project Engineer. Project engineer to determine if an abandoned water main could be used as a sleeve for the installation of a new force main in the Florida Department of Transportation (FDOT) right of way. Evaluated potential technologies, obtained cost proposals, and monitored inspection activities.

City of Key West | Wastewater Collection System Evaluation and Infiltration and Inflow (I&I) Study; Key West, FL

Project Manager. Project manager for the wastewater collection system evaluation and I&I study, which involved the development of design alternatives and the preparation of contract documents leading to the replacement of 20,000 feet of deteriorated sewers for the Key West Naval Air Station. Project was completed within the allocated design and construction budget, reduced the need for one lift station, and provided service to previously un-serviced areas.

City of Delray Beach | Wellfield and Transmission Main; Delray Beach, FL

Project Manager. Responsible for project management, master planning, civil, geotechnical, electrical, and structural engineering, groundwater modeling, environmental/permitting, land development, hydrogeological, and cost estimating oversight on the Morikami Park wellfield project. Since 1987, CH2M HILL has worked closely with the City of Delray Beach to successfully deliver a variety of projects including the implementation of multiple projects from the city's CIP. Completed projects include street beautification, infrastructure improvements, and water system planning, transmission, and distribution.

Amanda Schwerman, P.E., ENV SP

Ms. Schwerman's experience is focused on water and wastewater-related planning projects. Her expertise lies in water and wastewater hydraulic modeling, but she has experience with process/mechanical design as well. She is involved with professional societies including the WEF Collections System Committee, participating with AWWAs Engineering Modeling Applications Committee (EMAC) and M32 Updates, is a Trustee and the Membership Chair for WateReuse Florida and is a certified Envision Sustainability Professional.

PROJECT EXPERIENCE

City of Tampa | Potable Water Master Plan; Tampa, FL

Engineering Manager & Lead Modeler. Responsible for executing the potable water master plan and deliverables. The project included: updating and calibrating the existing hydraulic model using InfoWater, distribution analysis and improvements for four planning years (2015, 2020, 2025, and 2035), pumping and storage facility capacity assessments, resiliency and reliability assessments, asset management program development, risk based pipeline prioritization using InfoMaster, capital improvement program and Master Plan documentation. The City of Tampa distribution service area serves a population of approximately 610,000 people across 1 pressure zone at an average day demand of approximately 70 MGD. The distribution system includes one water treatment plant, five repump stations with tanks and several interconnections with Hillsborough County and Tampa Bay Water.

Greenville Water | Facilities Master Plan; Greenville, SC

Distribution System Evaluation Task Lead Modeler. Responsible for executing the water distribution system evaluation work and deliverables. Distribution system tasks included: performance criteria development; population, growth, and demand projections; all-pipes hydraulic model build from GIS; hydraulic model update and calibration/verification using WaterGEMS software; pressure zone delineation assessment; system capacity assessments for normal and fire flow demand conditions and pumping, storage, and pipeline improvement alternatives; asset management assessments of condition and criticality for pumping and storage facilities; system monitoring and SCADA assessments; prioritize CIP through the year 2040; development of CIP and financial forecasting tool; and facilities plan report. Project also included a water treatment evaluation. At the time of the project, Greenville Water's water system served a population of approximately 500,000 people in the City of Greenville and surrounding communities in Greenville County across 15 pressure zones at an average day demand of approximately 60 MGD.



WATER / WASTEWATER / STORM WATER MODELING

Expertise: Water, Wastewater and Reclaimed System Planning, Transient, Hydraulic and Water Quality Modeling

Education

- MS, Civil/Environmental Engineering, Colorado School Mines
- BS, Civil Engineering, Colorado School Mines

Professional Registration
PE - Civil, 70751, FL, 2009

Total Years of Experience 12

Years of Experience with B&V

- **Professional Associations**
- WaterReuse Association (Trustee 2016 - 2019 and Membership Chair)
- Water Environmental Federation (Collections Systems Committee Workshop Committee Vice Chair)
- Florida Water Environmental Association
- American Water Works Association (Engineering Modeling Applications Committee, and M32 Update Contributor)

Office Location Tampa, FL

Tampa Bay Water | System Engineer; Pasco County and Hillsborough County, FL

Project Engineer for the following tasks:

2035 System Analysis – Developed and participated in a variety of efforts to prepare the 2023 System Analysis which was updated from the 2025 System Analysis. Efforts included analyzing emergency break scenarios, member government meetings, bi-weekly status updates and proposed system improvements.

Transient Analysis – Provided professional services to perform a surge (a.k.a. transient) analysis of the existing regional Transmission Main, two wellfields and the enhanced surface water system system using Bentley's HAMMER. The primary objective of the project was to assess transient impacts resulting from a number of trigger events such as an emergency shutdown, pump startup and valve closure. Transient improvement measures such as pump control valve optimization, combination air/vacuum valve (CAV) optimization, surge anticipator/relief valves, rupture disks and elevated tanks were analyzed. The Regional Transmission system consists of three pump stations, 4 additional supply sources, 16 pumps, and 13 customer connections. The system demands are approximately 180 MGD and the model consists of 282 miles of pipe, ranging in diameter from 6-inch to 84-inch, 268 CAVs, 16 SAV/SRVs and 7 rupture disks.

Gwinnett County Department of Water Resources | Sewer Basin Model Updates; Gwinnett County, GA

Engineering Manager/Modeler. Provided professional services to GCDWR to update the pipe and manhole inverts throughout several sewer basins based on the updated GIS and perform dry and wet weather calibration using Bentley's SewerGEMs. The primary objective of the projects was to provide the County with updated/calibrated models ready for them to perform capacity analysis evaluations. Basins included: Level Creek, Brooks Rd, Richland Creek, Ivy Creek and N. Chattahoochee.

City of Raleigh Public Utilities Department | Sanitary Sewer Capacity Study; Raleigh, NC

Planning Engineer/Modeler. Black & Veatch is completing a detailed Sanitary Sewer Capacity Study for the City of Raleigh Public Utilities Department (CORPUD). The results and recommendations from this project will establish future wastewater collection system improvements and related capital expenditures through the year 2040. Ms. Schwerman worked on the performance criteria and design storm selection and system assessment tasks. The CORPUD sanitary sewer collection system conveys wastewater flow to 3 wastewater treatment plants and serves a population of approximately 550,000 people in the City of Raleigh and surrounding communities at an average annual flow of approximately 45 mgd. The hydraulic model (InfoWorks CS) contains over 350 miles of pipeline including all pipes 15 inch and larger and 8-inch pipes in some areas of the system.

Miami-Dade Water and Sewer Department | Water Service Improvement to Non-Residential Properties; Miami, FL

Engineering Manager. Assisted the Miami-Dade Water & Sewer Department (MDWASD) with developing a plan, including planning level cost estimates and project schedules for the improvements of water infrastructure to non-residential zoned properties within MDWASD's service area currently under-sized to bolster commercial re-development. Once the project is implemented, over 15,000 parcels sites will have improved water service.

Maurice Tobon, P.E.

Mr. Tobon has over 25 years of experience in water and wastewater engineering in South Florida. He serverd for over fifteen years at the highest management levels of two of the largest water utilities in south Florida (Palm Beach County and City of Fort Lauderdale) and was responsible for nearly \$1 billion in program management capital improvements. Having worked in government for many years, Mr. Tobon possesses unique experience and understands the issues faced by water and wastewater utilities. He excels in the implementation of change management techniques to improve efficiency; drives accountability at all levels, and underscores superior public service. Mr. Tobon is responsible for formulating sustainable infrastructure solutions in line with strategic visions and key intended outcomes and missions as defined by the Executive Administration.

PROJECT EXPERIENCE

Palm Beach County Water Utilities Department | 2012 Water and Wastewater Masterplan; Palm Beach County, FL

Director of Engineering. This project was for the development of the 2012 Water and Wastewater Masterplan for Palm Beach County Water Utilities Department. Both masterplans recommended over 500 million dollars in capital projects which served as the basis for ongoing Capital Improvement Program. The masterplans were developed by consultants under the direction and supervision of Mr. Tobon.

Palm Beach County Water Utilities | 2014 Glades Region Water and Wastewater Masterplan; Palm Beach County, FL

Director of Engineering. This project provided the creation of the first Water and Wastewater Master plan for the municipalities of South Bay, Belle Glade, and Pahokee. The master plan summarized the existing conditions of the water and wastewater systems, created hydraulic models for water and wastewater collection systems and prioritized improvements including treatment systems. The master plans were developed by consultants under the direction and supervision of Mr. Tobon.

City of Fort Lauderdale Public Services | 2007 Water and Wastewater Masterplan; Ft. Lauderdale, FL

Engineering Design Manager. This project provided for the 2007 Water and Wastewater Master plans for the City of Fort Lauderdale. Both master plans developed over 550 million dollars in capital projects which served as the basis for Waterwork 2011 Program Management. Consultants under the guidance, direction, and supervision of Mr. Tobon developed the master plans.



Tobon Engineering

WATER / WASTEWATER / STORM WATER MODELING

Expertise:

Water and Wastewater Engineering; Hydraulic Modeling; Program Management

Education

- ME, Civil Engineering, University of Florida
- BS, Civil Éngineering, University of Florida

Professional Registration

- PE 49373, FL, 1992Project Management
- Professional (PMP) Total Years of Experience

27

Professional Associations

- Water Environment Federation
- American Water Works Association
- American Society of Civil Engineers
- Engineers Without Borders

Office Location Coral Springs, FL

Palm Beach County Water Utilities Department | Lift Station Rehabilitation Phases 1 - 4

Director of Engineering. Rehabilitation of 38 lift stations during a 4 year period, rehabilitation included new wet well coatings, valves, piping, pumps and control panels. Mr. Tobon was responsible for the directing and advising staff from preliminary design through construction.

Palm Beach County Water Utilities Department | South County Water Service Replacement Phases I - III

Director of Engineering. Replacement of approximately 2,000 water services and replacement of AC water mains in the southern portion of Palm Beach County. Project was a multiyear multimillion dollar effort that involved a consultant design team and various construction contracts. Mr. Tobon was responsible for the directing and advising on the design and facilitating construction of the improvements.

Palm Beach County Water Utilities Department | Water and Sewer Service to North County Airport

Director of Engineering. Construction of a 3-mile water main and sewer force main to serve North County Airport. Project also consisted of a jack and bore under an active railroad track. Project was designed and managed during construction by County staff. Mr. Tobon was responsible for the directing and advising on the design and guidance during construction.

Palm Beach County Water Utilities Department | FPL 36 Inch Reclaimed Water Pipeline

Director of Engineering. Construction of an 18 mile 36-inch Reclaimed Water Pipeline from the East Central Regional Wastewater Treatment Plant to the West County Energy Center. The project consisted of 11 direction drills including under the Florida Turnpike and thru the West Palm Beach Water Catchment Area. The total \$ 52 million project was a Public Private Partnership between Palm Beach County and FPL. The pipeline portion of the project was designed by Palm Beach County staff under the supervision of Mr. Tobon who was also involved during construction; the total cost of the pipeline was \$ 19 million.

Palm Beach County Water Utilities Department | Water and Wastewater Masterplan

Director of Engineering/Program Manager. Mr. Tobon was at an Executive level position managing and providing leadership to a staff of 35 in the Engineering Division and consultant Program Managers for the Water Utilities Department \$ 400 Million CIP. Staff includeed a total of over 10 professional engineers, construction managers, engineering inspectors and support staff. He was personally responsible for creating the Program Management program (*WUD 2020 Capital Improvements Program*) by effectively managing staff and consultant partners.

City of Fort Lauderdale Public Services | Stormwater Management Analysis River Oaks and Edgewood Communities

Engineering Design Manager. The project was for the development of options to deal with repetitive flooding on these two neighborhoods. The recommendations produced by the consultant in this report for these areas were included with the gravity sewer extension project into these areas. Mr. Tobon was actively involved as technical review and responsibility to include the improvements into the *Waterworks 2011* Program.

Blake Guillory, P.E., D WRE

CAREER

RADISE International, L.C.

President. As President of RADISE International, Mr. Guillory is responsible for the overall performance of the firm and is engaged every day with clients and projects. He has worked at all levels of project leadership including Principal-in Charge, Project Director, Project Manager, and Project Engineer on hundreds civil and water resources infrastructure projects. His experience encompasses master planning and design for water, wastewater and stormwater utilities, civil site engineering, surface water hydrology and hydraulic modeling, water quality, permitting, specifications and construction services.

Southwest Florida Water Management District (SWFWMD)

Executive Director. During his role at SWFMD, Mr. Guillory doubled the budget for cooperative funding projects for local government from \$33M to \$70M per year.

South Florida Water Management District (SFWMD)

Executive Director. He oversaw the District's efforts to receive approval of the \$3B Central Everglades Planning Project (CEPP) Chief's Report. He re-established the cooperative funding program and led the creation of a \$1B master list of needed public water projects in the 16-county area. He promoted an updated vision of operations and maintenance for the \$13B Central and Southern Flood Control Project and the ongoing life cycle analysis its infrastructure, most of it constructed 50 years ago. He also saw the completion of the A-1 and L-8 Flow Equalization Basins, and started construction of the C-44 and C-43 reservoir projects and also restarted the modeling and evaluation of South Dade operations to address flooding. But he will be most remembered for creatively negotiating a package deal with the US Army Corps of Engineers to complete the Kissimmee River Restoration, Ten Mile Creek and the C-111 South Dade Projects.

Brown and Caldwell

Vice President and Area Manager. Led six offices providing, wastewater, stormwater, solid waste, environmental sciences and business consulting expertise.

PBS&J/Atkins

Practice Leader and Vice President/Sr. Division Manager. Led water resources teams and projects from Virginia to Florida.

CDM

Practice Leader and Project Manager/Engineer. Provided services on a wide variety of water resources projects throughout Florida.



WATER / WASTEWATER / STORM WATER MODELING

Expertise:

Public and Private Sector Senior Management; Quality Control; Master Planning and Design; Business Consulting; Planning; Permitting; QA/QC Review; Construction Services

Education

- MBA, Business Administration, University of South Florida
- ME, Civil Engineering, University of South Florida
- BS, Petroleum Engineering, Texas A&M University

Professional Registration

- PE 45230, FL 1992
 Diplomate of Water
- Resources Engineering

Total Years of Experience 29

Professional Associations

- Florida Engineering SocietyAmerican Society of Civil
- Engineers • Florida WateReuse
- Association

 American Water Resources
- American water Resource
 Association
 Florida Stormwater
- Association

Office Location Palm Beach, FL

PROJECT EXPERIENCE

- City of Opa-Locka | Canal Restoration Projects; Opa-Locka, FL
- Palm Beach County | Broadmoor Neighborhood Redevelopment
- Miami Dade County | FL C-4, C-6 and C-9 Basin Master Plans
- USACE | Ten Mile Creek Reservoir and Stormwater Treatment Area; St. Lucie County, FL
- Hillsborough County | Little Manatee River Watershed Plan; Tampa, FL
- South Florida Water Management District | Stormwater Treatment Area, Compartment B Buildout, West Palm Beach, FL
- Escambia, Pasco, Bay, and Brevard County | Stormwater Master Plans

Matt G Morey, GISP

Mr. Morey is the East Region Asset Management/Information Solutions Lead supporting Black & Veatch's Water Division. He has over 13 years of program management, consulting, and system implementation experience on projects for municipal government public works, water, wastewater, and stormwater utilities clients. He specializes in CMMS solution requirements development, systems implementation and refinement, report creation, and systems integration requirements development.

PROJECT EXPERIENCE

Salt Lake City Utilities | CMMS Implementation for WRRF; Salt Lake City, UT

Asset Management and Information Systems Lead. Responsibilities include leading the implementation of the City's CMMS for the water reclamation facility. Primary tasks include geodatabase design for vertical assets, supporting and QAQC of field data collection, supporting an integration to the City's SCADA system, designing and configuration of the CMMS, preventive maintenance task collection, report design and creation, business process analysis, and end-user training.

Charlotte Department of Transportation | CMMS Implementation; Charlotte, NC

Asset Management and Information Systems Lead. Leading the CMMS implementation for the Departments Streets Maintenance, Traffic Operations, Public Service, and Planning Divisions. Responsibilities include business process analysis, system installation, system design and configuration, system integration design, report design and creation and training of key staff.

Jackson Energy Authority | CMMS Implementation; Jackson, TN

Asset Management and Information Systems Lead. Leading the CMMS implementation for the Authorities Water and Wastewater divisions. Responsibilities include business process analysis, system installation, system design and configuration, customer billing integration design, and training of key staff.

City of Mesa | Asset Management Master Planning for Signal Butte Water Treatment Plant; Mesa, AZ

Asset Management and Information Systems Lead. Responsible for leading development of asset management strategy and assessment of various Computerized Maintenance Management Systems to support operations and maintenance activities at the new Signal Butte Water Treatment Plant. Project involves definition of functional requirements for utility-wide asset and maintenance management system, vendor comparisons, and implementation planning and support.

Charlotte Area Transit System | Implementation Support for Customer Service; Charlotte, NC

Asset Management and Information Systems Lead. Supported City staff



EAMS IMPLEMENTATION LEAD

Expertise:

ArcGIS; Asset Management; Cityworks; CMMS; Database Management; ESRI; GIS; Lucity; Oracle; SQL Server

Education

 BS, Marine Science, Coastal Geology, Coastal Carolina University

Professional Registration

 Certified GIS Professional, 00066654, 2010

Total Years of Experience 13

Years of Experience with B&V 1

Office Location Charlotte, NC with the implementation of the Service Request module for their existing CMMS to transition users off a home-grown CRM system. Tasks included caller and call history data migration, user-interface customization including a bus driver lookup plugin, advanced database support, and reporting support.

City of Rock Hill | CMMS Implementation; Rock Hill, SC

Asset Management and Information Systems Lead. Assisting with the upgrade of Cityworks from a desktop environment into a Cityworks Server AMS environment; updating existing configuration; creating custom training materials and "cheat sheets" for quick reference and the training of key staff.

Charlotte Area Transit System | Asset Management System Implementation; Charlotte, NC

Project Manager/Sr. Technology Consultant - GHD Inc. Project manager and technical lead for the implementation of the Facilities division's asset management system, which is used to manage work for the division's buildings, light rail stations, and bus stops. Responsibilities include leading the implementation of the asset management system, developing business process workflows, using the ESRI BISDM template to design the asset registry geodatabase, system design and configuration, developing reporting requirements, and leading training efforts.

Charlotte Water | Work and Asset Management (WAM) Program; Charlotte, NC

Sr. Technology Consultant - GHD Inc. As Senior Technical Consultant, responsible for defining configuration requirements, GIS design, and system deployment for users of an EAMS, which is being utilized as the organization's primary work management application. The WAM application was deployed using an EAMS that is accessed by over 250 regular users and manages over \$2,000,000 in active inventory for 8,400+ miles of pipe, 400,000+ point assets, and eight treatment plants, including five waste water treatment plants and three water treatment plants.

Oakland County Water Resources Commission | Collaborative Asset Management System (CAMS) Implementation; Waterford, MI

Technical Lead - Woolpert. Technical lead for the implementation of a Collaborative Asset Management System (CAMS) for the Commission's water, wastewater, and stormwater assets. Implementation tasks included CMMS system design and implementation, hardware and software requirement development, geodatabase design, system installation, system upgrade, report development, historic data migration, and. Additionally supported the development of system integrations to County's utility billing, human resources, and financial systems.

City of Suffolk | CMMS Implementation; Suffolk, VA

Project Manager/Technical Lead - Woolpert. Assist with City-wide implementation of the City's CMMS. Implementation tasks included system design and implementation, training, report writing, geodatabase design, development of hardware and software requirements, GIS and CMMS upgrade, and best practices consulting. The system has been implemented for the City's Traffic Engineering, Streets Maintenance, Stormwater, Solid Waste, Assessor, and Utility departments.

St Johns County | Asset Inventory and CMMS Implementation; St Augustine, FL

Technical Lead - Woolpert. Worked with the County's project team to implement a CMMS for the pavement, roads and bridges, traffic, and fleet divisions. A geodatabase was designed and implemented to house the asset data collected by survey staff to be used within the CMMS. The project team performed the installation, data loading and tuning of the Department's enterprise geodatabase, and assisted the Department with the upgrade their enterprise RDBMS.

Joe D North

PROJECT EXPERIENCE

Utilities, Inc. | CMMS Pilot Implementation; Florida

Lead Implementer. Following the system selection process, Mr. North led UI's pilot implementation of Lucity. Responsibilities included:

- Developing a system architecture
 Designing and documenting plan to guide the IT infrastructure setup
- Developing a pilot plan to outline the Lucity pilot implementation process.
- Facilitating business process mapping workshops
- business processes, system configuration, and system integrations
- System configuration System testing
- Developing custom training documentation
- Go-live support

Plantworks | Third Generation Cityworks Plant Navigation Tool; North Carolina

Lead Developer. Designed and developed a third generation solution for managing vertical assets (e.g., non-spatial plant or facility assets) within a GIS-based Cityworks environment; which contains the following features:

Straightforward, one-click access to the all vertical assets displayed in an intuitive, hierarchical format

When used in Base Mode, allows users to take the following actions against any asset via a simple context (i.e., right-click) menu:

- View Asset
- Create Work Order
- Create Inspection

- Add to Open Work Order View Work Order History
- When used in Edit (i.e., Administrative) Mode, allows authorized users to take the following advanced actions against any asset via the same context menu:
- Edit Asset
- Add New Asset
- Replace Asset
- Remove Asset

Seamless integration with the Cityworks web environment, allowing users to feel like they've never left Cityworks and providing configurable links to other Cityworks pages (e.g., WO Search, Inspection Saved Searches, etc.)

City of Charlotte Solid Waste Services | Cityworks Implementation; Charlotte, NC

Project Manager - GHD Inc. Project Manager involved in Solid Waste Services' (SWS) business process and workflow analysis, legacy system data migration, legacy system integration, and Azteca Cityworks installation, configuration, testing, and deployment. Roles and responsibilities include:



GIS & EAMS IMPLEMENTATION SUPPORT. **INEGRATION** DEVELOPMENT

Education

- Master of Arts. International Business, University of Florida
- MS, Management,
- University of Florida BS, Computer Engineering, University of Florida

Total Years of Experience 10

Years of Experience with B&V 1

Office Location Charlotte, NC

- facilitating the business process analysis workshops, the address data migration from existing systems, and the user testing and acceptance workshops
- adapting and customizing system interfaces based on feedback from business process and testing sessions
- training and mentoring management and field personnel
- developing and deploying custom reports
- gathering requirements for and developing the asset data integration from the existing CRM system to Cityworks
- gathering requirements for and developing an exception manager web application to manage asset data exceptions detected in the asset data integration
- Work Order Bulk Add Tool
- Multi-Family Multi-Point Array Generator

- gathering requirements for and facilitating the development of the bidirectional work management integration between the existing CRM system and Cityworks
- managing and designing the migration process of 15+ years of work management data into Cityworks (approximately 4,000,000 discrete work orders)
- managing and supporting Cityworks Server AMS go-live in March 2015
- gathering and documenting requirements for, developing, testing, revising, and deploying the following custom data management web applications:
- SWS Address Attribute Manager
- Business Data Manager
- Multi-Family Data Manager
- Route Data Manager

Charlotte Water | Work and Asset Management Implementation; Charlotte, NC

Project Manager - GHD Inc. Project Manager involved in asset management framework development, business process and workflow analysis, and Azteca Cityworks installation, configuration, testing, and deployment. Roles and responsibilities include:

- Facilitating user testing and acceptance workshops
- Reviewing asset information management systems employed by different business units
- Designing and populating asset registers
- Adapting and customizing system interfaces based on feedback from business process and testing sessions
- Coordinating mobile equipment setup, testing, and deployment
- Training and mentoring management and field personnel

- Facilitating business process analysis workshops
 Coordinating the annual inventory reconciliation with a new inventory system
 - Developing and deploying custom reports
 - Managing and supporting a multi-phased
 - Cityworks Server AMS go-live event during the month of January, 2012
 - Providing post go-live Cityworks and mobile fleet support
 - Managing and supporting Cityworks upgrades to 2013 R1 and 2014 SP2
 - Facilitating workflow design and configuration workshops for deployment in Cityworks Server PLL
 - Adapting and implementing workflows for **Cityworks Server PLL**
 - Managing and supporting a multi-phased Cityworks Server PLL go-live event beginning in April 2015

Traci Lynn Berlingieri

Ms. Berlingieri has 18 years of professional consulting experience in asset management implementation and GIS database design. She also has extensive experience in GIS projects with stormwater, water, and wastewater clients including field asset inventories. Traci has also implemented asset management systems for several of those clients in order to further develop their enterprise systems.

PROJECT EXPERIENCE

Jackson Energy Authority | Cityworks Implementation; Jackson, TN

Asset Management and Information Solutions Senior Analyst. Responsibilities include the implementation of the asset management system for water, wastewater, gas, and electric departments, developing business process workflows, conducting several on-site workflow and configuration workshops, asset management system administration and configuration, developing reporting requirements, creating reports in Crystal Reports, and leading end-user and administrator training.

Tulsa Metropolitan Utilities Authority | Tulsa Metroplitan Utilities Authority Utility Enterprise Initiative (UEI); Tulsa, OK

Asset Management and Information Systems Senior Analyst. Responsible for documentation of GIS geocoding of legacy work orders to be migrated to Cityworks. This program is building Tulsa's asset management capabilities according to ISO 55000 standards. Program implementation tasks include developing asset management policies, strategies, objectives, and plans, as well as other framework activities to support overall implementation of asset management. There is a large focus on developing and consolidating information systems to provide a cohesive asset management system that is aligned with the City's Business Intelligence and Performance Management Systems. The UEI and associated activities build upon the work and recommendations from TMUA's Comprehensive Assessment project and constitute a continuous program of asset management and planning activities since 2011.

Charlotte-Mecklenburg Utility Department (CMUD) | Enterprise Asset Management System; Charlotte, NC

Senior Technology Consultant - GHD. Responsibilities include creating Crystal Reports reports for use in the Cityworks Permitting, Licensing, and Land (PLL) application.

City of SeaTac | Asset Management System Reporting and Field Mode Implementation; SeaTac, WA

Implementation Consultant - Timmons Group. Responsibilities include creating two new reports in Crystal Reports to be used with their current asset management system. In addition, documentation and training were provided on how to use Cityworks Server AMS Field Mode.



GIS EAMS IMPLEMENTATION DEVELOPMENT

Expertise: Asset Management (AM); Azteca Cityworks; Computerized Maintenance Management Systems (CMMS); Crystal Reports; ESRI ArcGIS; Geographic Information Systems (GIS)

Education • BS, Geography, Ball State University Total Years of Experience 18 Years of Experience with B&V 1 Office Location

Office Location Charlotte, NC

Weston Public Works | Asset Management System Implementation; Weston, FL

Implementation Consultant - Timmons Group. Responsibilities include leading implementation of the asset management system, developing business process workflows, conducting on-site workflow and configuration workshops, asset management system administration and configuration, developing reporting requirements, creating reports in Crystal Reports, and leading end-user and administrator training. City staff and contractors are using the asset management system in the office and field to complete service requests and work orders.

Alpharetta Public Works | Asset Management System Implementation; Alpharetta, GA

Implementation Consultant - Timmons Group. Full asset management system implementation in the Public Works department for water, wastewater, storm water, and recreation and parks staff. Responsibilities include leading the data conversion efforts from a legacy asset management system to the new asset management system. Also assisted with the system configuration and report writing in Crystal Reports.

Goochland County | Asset Management System Implementation; Goochland, VA

Implementation Consultant - Timmons Group. Responsibilities include leading implementation of the asset management system, administration and configuration, and end-user training. County is currently using the system for utilities staff, facilities staff, and IT staff as their help desk system.

City of Alcoa Engineering/Public Works | Asset Management System Quick-Start Implementation; Alcoa, TN

Implementation Consultant - Timmons Group. This is a modified implementation ("quick start") with only one division using the system with additional divisions going on-line in the future. Responsibilities include leading the implementation of the asset management system, conducting on-site workflow and configuration workshops, system administration and configuration, and leading end-user and administrator training. The Public Works division is currently using service requests, work orders, and inspections both in the office and in the field.

City of Deerfield Beach | As-built Data Conversion; Deerfield Beach, FL

GIS Analyst/Phase Manager - Woolpert. City of Deerfield Beach, FL requested that their as-built drawings (over 2000 individual sheets) be digitized into a GIS using ESRI's Local Government Model. Responsibilities included geodatabase design, conversion, QA/QC, delivery, overseeing team efforts to complete conversion.

City of Suffolk Public Utilities | Asset Management System Implementation; Suffolk, VA

GIS Analyst/Phase Manager - Woolpert. Responsibilities include assisting with the asset management system implementation for the water and wastewater distribution divisions. Assisted with the implementation for the water treatment plant including leading the data collection effort.

City of Suffolk Public Utilities | Public Utilities (Water and Wastewater) GIS; Suffolk, VA

GIS Analyst/Phase Manager/Project Manager - Woolpert. Responsibilities include leading GIS effort to convert water and wastewater data from digital as-builts to GIS format. Led team of several GIS analyst converting the data and was responsible for QA/QC of all data before delivery to client. Worked closely with client and attended on-site monthly status meetings and data review sessions.

Shelley Ann Hill

Ms. Hill is a senior application developer with over 15 years of experience specializing in GIS applications. She develops high-quality desktop and web-based solutions focusing on dynamic, modular, and configurable properties during design. She has written applications in numerous programming languages and stays current with industry standards and new software libraries.

PROJECT EXPERIENCE

City of Memphis | Sanity Sewer Overflow Program - Program Management Dashboard Application; Memphis, TN

Senior Application Developer. Ms. Hill was responsible for design, development, testing, documentation, deployment and acceptance of a Program Management Dashboard application. This application is a web solution that combines AngularJS, Google Charts, the ArcGIS JavaScript API, and a custom query extension for ArcGIS Server to allow members of the project team to quickly review statistics of the sanitary sewer system as reported in the GIS as well as the monitor the progress of the field data collection program by contractor.

New York City Housing Authority | NYCHA Water Metering Program - GPS Application; New York, NY

Senior Application Developer. Ms. Hill was responsible for design, development, testing, documentation, deployment and acceptance of a GIS-focused Program Management application that displays information from a Primavera P6 SQL Server database. This application is a web solution that combines Backbone Marionette, the ArcGIS JavaScript API, and a custom web service to allow users to view the P6 schedule in several formats. SQL Server views and stored procedures return schedule information for each work site at current time as well as one-week and one-month look aheads and the application displays the results in summary charts and full tables as well as part of a dynamic map display.

Jackson Energy Authority | SSE Viewer; Jackson, TN

Senior Application Developer. Ms. Hill developed a custom map viewer using the ESRI Javascript 4 API to allow users to track the progress of sanitary sewer inspections. Users can perform quick searches to locate assets and view inspection pictures and other information within these results.

Jackson Energy Authority | Utility Map Viewers; Jackson, TN

Senior Application Developer. Ms. Hill extended the ESRI Javascript 3 map viewer to deploy four custom utility map viewers: water, wastewater, electric and gas. These viewers provide network tracing capabilities to perform main isolation, valve shut-off, and upstream-downstream traces for water, wastewater, gas and electric utilities. Additional application



INTEGRATION DEVELOPMENT

Expertise: Angular; ASP.NET; Dynamic Web Applications; ESRI; GIS; JavaScript; Oracle; SQL Server

Education

- Software Engineering, Florida State University
- Bachelor of Arts, Geography, University of Maryland Baltimore County
- **Professional Registration**
- Certification, CompTIA Security +, IL, 2013

Total Years of Experience 15

Years of Experience with B&V 1

Office Location Dallas, TX functionality includes printing, searches, drawing tools and specialized identify results.

Upper Trinity River Water District | Utility Dashboard; Lewisville, TX

Senior Application Developer. Ms. Hill developed a custom Utility Dashboard web application that allows users to quickly view summary information about the utility assets such as total length of pipe and percentage of features that have been inspected in both KPI graphics and map views. This application uses the most current web technology including AngularJS, Google Charts and the ArcGIS JavaScript API.

Upper Trinity River Water District | Water District Viewer; Lewisville, TX

Senior Application Developer. Ms. Hill extended the ESRI Javascript 3 map viewer to deploy a custom water utility map viewer. This viewer provides network tracing capabilities to perform main isolation and valve shut-off operations.

Edwards Air Force Base | Environmental Assessment Inventory Program Environmental Document Management Application; Palmdale, CA

Senior Application Developer - Woolpert, Inc. Ms. Hill developed an AngularJS and ASP.NET Web API application that manages the federally mandated document and review process for construction projects with environmental impact at Edwards Air Force Base using a primary software design principle that generates all form content based on stored procedures in a supporting relational database and the database schema itself.

City of Columbus | Network Valve Operation Field Application; Columbus, OH

Senior Application Developer - Woolpert, Inc. Ms. Hill developed a web solution that combines AngularJS, ArcGIS JavaScript API, and custom network tracing extension for ArcGIS Server to allow utility foreman to plan exercises based on network queries and their impact on critical facilities, easily update valve records in the enterprise GIS, maintain work records for valve operations and record histories of each valve.

United States Air Force Material Command | Offline Editing Application; Dayton, OH

Senior Application Developer - Woolpert, Inc. Ms. Hill developed a dynamic self-hosted Node.js JavaScript application that uses AngularJS, ArcGIS JavaScript API and ESRI REST operations to download any ArcGIS feature service layer into locally stored JSON files and base map image files into an indexed CSV file so that editing and data collection can be performed in the field where no network access is available and then easily uploaded back into the enterprise GIS for Air Force Material Command and Air Force Special Forces Command.

United States Air Force Material Command | Highly Configurable Installation Map Viewer; Dayton, OH

Senior Developer - Woolpert, Inc. Ms. Hill developed a framework of interconnected .NET MVC, ArcGIS Flex API and Windows service applications that host unique GIS resources and tools to individual users base on role-based authorization for all nine Air Force Material Command installations providing a modular and extensible "one application – many user experience" solution that meets strict DoD cyber security requirements.

Andrew Hu

Mr. Hu has 25 years of experience in GIS system analysis and software application development. He is a principal GIS expert in system architecture, data analysis, database and software design, and application development for water and waste water utilities management, water security, integrated watershed analysis and master planning, water quality modeling, hydrology and hydraulics modeling, flood mapping, storm water and solid waste site management. He has a great track record of problem solving, forward thinking, with the ability to explain complex GIS issues to a non-technical audience. Deeply rooted in workstation and large system GIS modeling and computation, he is a frequent user of satellite imagery, aerial photographs, LIDAR, as well as complex vector data sources from varies formats.

PROJECT EXPERIENCE

Philadelphia Water Department, AQUA America, and DC Water | GIS System Design and Integration; Philadephi, PA

Principal GIS Developer /Solution Architect and System Integration Team Lead. Responsible for leading GIS system design and integrations with Water utility asset management, IT security, custom relation, and capital planning applications on multiple client projects. Also responsible for providing IT/GIS strategic and capacity planning advises and consultation and to our key water utility and GIS clients.

United States Department of Agriculture (USDA) | Washington DC

Principal GIS Developer/Solution Architect and Development Team Lead. Responsible for leading a large GIS development team from multiple consulting firms in the SAP-GIS application development and system integration effort in supporting USDA's agricultural service modernization program (MIDAS). Also responsible for coordinating with SAP solution architects and development team in the system integration, and providing support to business process analysis team working with USDA clients to develop requirement documents and software technical specification documents (TDS). Served as the principal GIS developer and solution architect responsible for the design and implementation of the first ever ArcGIS Server Portal and Web Application for the USDA Foreign Agricultural Service, transforming their decades of GIS desktop analysis tools and large collection of global agriculture GIS and satellite imagery database to a secured and easy-to-access Web GIS environment based on the latest ESRI GIS technology of ArcGIS Online and Portal for ArcGIS.

Boston Water and Sewer Commission (BWSC); Boston, MA

Senior GIS Developer/Solution Architect and Development Lead. Led the technical design and development of an enhanced risk assessment GIS tool (RECIPE) to analyze BWSC sanitary and storm assets individually using a weighted average approach developed by CH2M Hill to assess the likelihood of failure, consequences of failure, and overall risk of failure for



Expertise:

GIS; Software Application Development; Database and Software Design; Data Analysis

Education

- MS, Ecology and Geographic Information Systems, University of Tennessee
- BS, Ecology and Environmental Sciences, Lanzhou University

Professional Registration

- SAP GIS Integration partner training on GEO.e installation and implementation
- Google Authorized Google Earth Enterprise Installation and Training Instructor
- FEMA Authorized HAZUS-MH GIS Vendor and Instructor

Total Years of Experience 25

Office Location Washington, DC each pipe in the two systems. Mr. Hu was responsible for the requirement gathering, analysis, system design, and overseeing the software implementation, and user training.

Philadelphia Water Department (PWD); Philadelphia, PA

Senior GIS Developer/Solution Architect and System Engineering Technical Lead. Led the GIS technical design and development task coordination of online-water quality data management and GIS based system integration among all components of the large scale PWD Water Contamination Warning System (CWS) implementation effort.

City of Richmond | Storm Water Utility; Richmond, VA

Senior GIS Developer and Task Lead. Led the design and development of GIS and database tools to compute impervious area for each property within the city and determine appropriate storm water utility charges base on impervious area and a comprehensive rate structure established by the city. Developed automated GIS tools to format and export storm water utility charge information into a compatible format for the city's financial system to generate a storm water utility bill. Also responsible for on-site training of City staff to operate, maintain, and update the GIS system on an annual basis.

Fairfax County, Prince William County, Albemarle County, City of Alexandria, Virginia, and Anne Arundel County, Maryland | Stream Assessment Tools

Senior GIS Developer and Task Lead. Responsible for developing and delivering a series of stream assessment tool and database products for the clients above. These GIS tools were developed using ArcGIS with extensive ArcObjects programming. These tools greatly enhanced the county or city's watershed study conducted by their water resource engineers in collecting and analyzing the data necessary to characterize the watershed, assess future conditions, identify and rank problems, and recommend improvement projects.

South River Watershed Study; Anne Arundel County, MD

Senior GIS Developer/Task Lead. The purpose of this project was to assist County staff in updating an earlier watershed study of the South River by collecting the data necessary to characterize the watershed, assess future conditions, identify and rank problems, and recommend improvement projects. As part of this project the consultants will take part in an advisory Professional Management Team that provides oversight to the County's analysis efforts with the WMT, which will include compiling the results of GIS and field data collection, modeling drainage and water quality, and estimating benefits from proposed improvements. Andy is a key advisor in this Professional Management Team because he was the lead developer of the WMT.

City of Annapolis | Anne Arundel Waste Water Flow Projection Tool; Annapolis, MD

Senior Developer. Led the design and development of an integrated GIS waste water modeling application using ArcGIS/ArcObjects programming. The GIS based waste water modeling tool integrated with SewerCAD for hydraulic analysis and can help the county engineers to quickly analyze countywide waste water flow and make future flow forecast to help planning for capital improvement budget.

Jeff Brill

Mr. Brill has spent 13 years implementing and leading innovative technology results for a variety of clients. Previously, he worked 7 years at the Philadelphia Water Department, leading the effort to implement a best in class GIS, led the systems team in the development of a stormwater billing program, built and led the operational reporting team in support of the Cityworks implementation, and led the business process modeling team in support of green infrastructure. Mr. Brill leads CH2M's Intelligent Systems Practice in the Northern U.S. and has responsibility for 70 staff delivering a wide range of data management solutions in support of improved utility operations.

PROJECT EXPERIENCE

Mobile Area Water and Sewer System | PIMS Evaluation; Mobile, AL

Senior Technologist. Led a scaled down evaluation of alternatives for replacing MAWSS PIMS system for the Pretreatment Program. Met with staff to review capabilities, work processes, and staffing resources. Hosted a workshop to review key needs and prioritize goals for an improved information system to manage Pretreatment activities. Produced an technical memorandum summarizing the alternatives and rating the pro's and con's of each.

New Castle County | Asset Management; New Castle, DE

Senior Technologist. Led multiple tasks for the implementation of an Asset Management Program for New Castle County Special Services. Work included a review and recommendation for asset hierarchy, risk analysis, and development of business case evaluation tools for New Castle County to utilize in managing their CAPEX budgets.

DC Water | Asset Management Program; Washington, DC

Senior Technologist. Provided technical leadership for the data management components of the Asset Management Program at DC Water. Led multiple discovery workshop to review all asset data sources and data management workflows. Led a review of Asset ID strategies and developed recommendations to meet DC Water's needs. Led the effort to develop an asset data model and asset hierarchy for DC Water's Asset Management Program.

Aqua America | GIS Strategic Plan; Bryn Mawr, PA

Project Manager. Managed a small team in the planning and delivery of a Strategic Plan for Aqua America. Held a series of workshops with the leadership from each of the state based operational groups to discover the needs of individual operating organizations and the common threads for the organization as a whole. Synthesized the information gathered into a 5 year Strategic Plan to provide guidance to Aqua America on the current and



Expertise:

Data Management; Operational Reporting; Business Process Modeling; GIS; Cityworks

Education

 BS, Information Systems, University of Texas at Arlington

Total Years of Experience 13

Office Location Philadephia, PA future state of its technology program.

Philadelphia Water Department (PWD) | IT Architecture; Philadelphia, PA

Project Principal. Providing general technical guidance to a project team engaged with PWD to develop recommendations for server architecture needed to support the projected user base of 500 users in the next 18 months. Will ultimately assist PWD in specifying and implementing the hardware architecture necessary to support PWD's server computing needs for the next 5 years.

Forsyth County | GA Data Management System; Cumming, GA

Project Manager. Led the effort to build and deploy a data management system for Forsyth County, replacing an antiquated paper based maintenance management system. Oversaw a team of developers in producing a data hierarchy, mobile data collection application, and an enterprise reporting system.

Prince William County Service Authority | CMMS Product Evaluation; Prince William, VA

Project Manager. Led the effort with Prince William County to evaluate and analyze CMMS products for implementation suitability. Held workshops with divisions and departments to review and prioritize the needs of the organization in regards to a new CMMS implementation. Made recommendations on a preferred CMMS software package and drafted the RFP.

Wilmington Department of Public Works | GIS Program; Wilmington, DE

Project Principal. Managed a team of client and consultant based resources in the day to day maintenance of an enterprise GIS and CMMS system serving 6 departments and 120 staff.

Aqua America GIS Program | Bryn Mawr, PA

Program Manager. Managed a program team in the continuing support and implementation of an enterprise GIS system serving employees in 8 states. Assisted Aqua America in the rollout of 600 tablets for use around the country by field staff in the daily performance of their duties. Currently supporting the integration of Aqua America's CMMS and Customer Information System with GIS to further leverage the investment Aqua America has made in their GIS system.

New Castle County | CMMS Implementation; New Castle, DE

Senior Technologist. Served as the lead technical resource for planning and implementing New Castle County's GIS and CMMS systems. Led the data gathering and software installation tasks. Also led the configurations tasks for 4 different departments to plan, develop, and implement their final Cityworks configuration. This included SOP development and the training of staff.

Philadelphia Water Department | CMMS Support; Philadelphia, PA

Project Manager. Managed a team of client and consultant based resources in the planning and development of an enterprise reporting system to complement the data collection efforts in Cityworks CMMS. Organized weekly meetings and action items, prepared specifications and summaries, and delivered a system of 75 management reports in a single integrated Reporting Dashboard.

City of Hampton Roads | CMMS Evaluation; Hampton Roads, VA

Project Manager. Led the effort to produce a cost benefit analysis of a CMMS upgrade in collaboration with a planned ERP upgrade at Hampton Roads. Researched the costs, lessons learned, and potential obstacles at similar utilities to give Hampton Roads a series of benchmarks to establish a reliable estimated level of effort for the upgrade.

Joshua Truong

Mr. Truong is a Database Solutions Architect at CH2M since April 2016. His professional background is in software and database development. He has two summers of software developing experience as an intern with USAA in San Antonio, Texas. In school, he had two years of database development training.

PROJECT EXPERIENCE

City of Newport CSO Program

Inspected buildings in Newport, RI to ensure compliance with CSO program. Managed data from building inspections in the SQL database. Performed GIS edits to pipes and manholes based off of inspection records. Documented the architecture of the inspections database.

Minnesota Department of Transportation

Identified and updated the GIS attributes of intersections and road segments using ArcGIS online and Google Earth.

DeKalb County | Cityworks Implementation

Executed test scripts to ensure quality and accuracy of Cityworks configuration prior to deployment to DeKalb County. Documented the user instructions of the Cityworks application for the client. Participated in onsite user/client training of the Cityworks application.

Boston Sewer Water Commission

Wrote SSRS reports for building inspections and SQL queries to identify and analyze data from inspections. Created GIS maps in ArcGIS, using data-driven pages.

City of Wichita | Utility Capital and O&M Investment Planning, Wichita, KS

Researched topographical maps and created GIS maps of the City of Wichita, Kansas using ArcGIS and public data, showing waterbodies and city boundaries.

Seminole Tribe of Florida | Cityworks Implementation

Wrote SQL reports and queries for work order and requests for the Seminole Tribe of Florida (STOF).

DC Water | Asset Management Program

Created GIS maps for DC Water in ArcGIS, showing above ground rail lines and water pipes.

ACES | ACES Development

Revamping current ACES web tool to a more sleek and modern feel and design (front end development).



Expertise:

Software/Database Development; ArcGIS; C#; CSS; HTML; Java; JavaScript; MS Office Suite; SAP; SQL; Tableau

Education

 BS, Information Systems, University of Texas at Arlington

Office Location Boston, MA

USAA; San Antonio, TX

2014 and 2015 Summer Intern. Developed a hybrid mobile application complimenting IBM's Rational Team Concert, code collaboration software. Developed a new user interface for Enterprise Planning Management System (EPMS) time entry system, using HTML/CSS and JavaScript.

Courtney Kennedy, PE

Ms. Kennedy is experienced in database management and systems integration with a focus in supporting condition and risk assessment in relation to asset management. Ms. Kennedy has developed many types of solutions for utilities, from long-lasting, complex solutions (e.g. web applications designed to collect, manage and analyze field data) to simple solutions (e.g. simple data integration and QC queries designed to synthesize and QC numerous software packages' data). She is a trained facilitator with significant experience working with boards, community groups, and mapping business processes. Ms. Kennedy is an advanced user of Microsoft's software suites (including SQL Server, Visual Studios, SQL Reporting Services, and Access), other development software (Swift and Web Service consumption) and is proficient in CMMS systems (including Cityworks and Lucity), and CCTV inspection software packages (including Granite XP, PipeTech, and IT Pipes).

PROJECT EXPERIENCE

Montgomery County | Asset Management Plan; Montgomery County, OH

Data Manager. Converted historic CCTV data and scored the inspections using SCREAM condition scoring. Recommended changes to condition assessment data collection. Advised system upgrade and software selection.

New Castle County | Asset Management Program, CMMS Software selection, CCTV Software selection, Condition Assessment; New Castle County, DE

Project Engineer. Led business process mapping sessions to create 70 diagrams. Created TM of recommended improvements to processes and key reporting needs to help with CMMS software selection, ultimately leading to Cityworks implementation. Installed and integrated SCREAM software with Cityworks and chosen CCTV software to process inspections with SCREAM Next Step and Costing.

Columbus Department of Public Utilities | Asset Management; Columbus, OH

Developer/Project Engineer. Helped conduct condition scoring system review. Designed, installed and integrated SCREAM CCTV scoring with PipeTech database and sent results to Oracle. Designed and implemented data integration plan including nightly data scoring process and custom SQL web reports. Performed pilot test of SCREAM Next Step and costing modules. Supplied continuous on-call support.

City of Dayton | Asset Management Plan; Dayton, OH

Project Engineer/Developer. Conducted data flow mapping and data gaps analysis. Converted historic Granite XP CCTV data and scored the inspections using SCREAM condition scoring. Advised system upgrade, software selection and developed an implementation plan to work with their



Expertise:

Database Management; Systems Integration; Asset Management; Staff Training; Microsoft Software Suites; CMMS Systems; CCTV Inspection Software

Education

- MS, Civil/Environmental Engineering, University of California, Berkeley
- BS, Environmental Engineering, Cornell University

Professional Registration

• PE - CA, PA Total Years of Experience 19

Office Location Philadelphia, PA existing Hansen system. Helped manage data collection and risk scoring for both water distribution and sewer collection assets.

Cit of Suffolk | SCREAM[™] Development; Suffolk, VA

Project Engineer/Developer/Database Administrator. Helped design and developed condition assessment/I&I applications to help the City of Suffolk come into compliance with their Consent Order. SCREAM was used to manage and assess the status of their sewer system. The SCREAM[™] applications created included data entry tools for manhole and lamping, and for smoke and dye testing. Created a way for information from the data entry tools and from the utility's own data store to be integrated and uploaded into a SQL server database where the SCREAM tm scoring methodology was applied. Created web-based reports so users could easily browse to the results which included the following for each asset: structural score, maintenance score, I&I score, potential I&I defect flow. Also created roll-up and summary reports and helped push the data into GIS for analysis on the map.

Anchorage Water and Wastewater Utility | Asset Management Plan; Anchorage, AK

Project Engineer/Develop. Facilitated selection of CCTV defect coding system. Converted historic Granite XP CCTV data and scored the inspections using SCREAM condition scoring. Created custom SQL web reports.

Multiple Clients for OMI | Asset Condition Evaluation System (ACES)

Developer/ Database Administrator. Designed and developed a CH2M HILL condition assessment and risk analysis application for use by CH2M HILL clients and an OMI condition assessment team. ACES is a web based program with SQL server database that synchronizes with tablet PCs in the field. The application allows Districts to input, review and prioritize condition and risk assessments of equipment in their plants (including distribution and process piping and related images and documents). The Application incorporates computerized maintenance management system data, importing it from a fixed format file. ACES has been successfully used for ten clients.

Philadelphia Water Department | Cityworks Implementation; Philadelphia, PA

SQL Developer/Custom Reports Coordinator. Worked with city staff to target, design and develop custom Cityworks reports. Oversaw development tasks.

City of Wilmington Department of Public Works | Work Order Management System Implementation; Wilmington, DE

Project Engineer. Worked as part of Cityworks implementation team. Interviewed Department staff and created business process diagrams to prepare for Cityworks configuration. Planned for Cityworks implementation, helped with implementation of service requests and trained Department staff during a week-long intensive training session. Created customized SQL based web reports and email reports for DPW staff to view data in a variety of ways. The email reports were automatically sent each week to summarize overdue tasks.

Evesham Municipal Utilities Authority | Custom Asset Management System; Evesham, NJ

Developer/Database Administrator. Designed and developed a custom work order management application to interfaced with the City's GIS application. The application included tracking of CCTV, hydrant maintenance, manhole rehabilitation, monitoring well sampling, sewer main repairs, water main breaks, water valve condition assessments and well flow tracking. Selecting an asset in GIS prompted the custom access application to open to the correct form, according to asset type.

Jacob Peck

Mr. Peck applies his skills in computerized operations and maintenance (O&M) management systems, database management, and Six Sigma and Lean processes to optimize daily O&M functions at facilities throughout North America. His expertise in automating report generation and building useable databases helps staffs deliver services to clients more efficiently and effectively.

PROJECT EXPERIENCE

Boston Water and Sewer Commission | Facility Plan Condition Assessment; Boston, MA

Project Engineer/Task Manager. Mr. Peck is the task manager, through transition and closeout. for the \$2.5 million condition assessment task for Boston Water Sewer & Commission Facility Plans. Prior, he served as the project engineer on the condition assessment task before being asked to manage the task. As a project engineer, he is assigned to oversee the subcontractors and to manage the condition assessment data. This includes on-site appearances with the subcontractor and training of CH2M's condition assessment procedures and tool, SCREAM. He is responsible for ensuring data quality and integrity and preparing reports and recommendations based on the condition assessment data. As a task manager, he managed the fourteen subtasks through transition and closeout. This includes working with the client to finalize deliverables. One those deliverables being the implementation of SCREAM, a critical success factor for a successful project, which Mr. Peck lead by both managing and being the technical lead. Implementation consisted of several training workshops for both the Commission and their subcontractor and physical implementation of the SCREAM tools. He is also updating work plans and managing budgets.

City of Newport Utilities Department; Newport, RI

Solutions Architect. Mr. Peck developed and implemented a database solution to improve the efficiency and data quality of the building inspection program for the Department of Utilities. This including using ESRI's collector app to collect data and integration with other pieces of information such as letters and scheduled appointments. Specific tasks in this project were:

- Migrated paper building inspection data into the mobile data set to create one central database for all building inspections. Significant quality control measures were run on the migrated data in order conform it to the central database.
- Streamlined and automated the QC process. Instead of manually checking once a week, the system sends out a daily email. This eliminated the need to perform QC in the office and significantly reduced errors.
- Created real-time reporting using SQL reporting services. Several reports were created including a building report that included all inspection history and photos taken during the inspection, summary reports that



Expertise: Database Management; Systems Integration

Education

- MBA 2017 Candidate, Northeastern University, Boston, MA
- MS, Mechanical Engineering, Drexel University, Philadelphia, PA
- BS, Mechanical Engineering, Drexel University, Philadelphia, PA
- Sigma Kaizen Greenbelt Training

Professional Registration EIT

Total Years of Experience 6

Professional Associations

- Golden Key International Honor Society
- National Engineering Honor Society
- National Society of Collegiate Scholars

Office Location Boston, MA summarized inspections to date and the status of those inspections.

- Created a letters database so to create and track letters sent to residents and which type of letter was sent. Residents were required to be notified before an inspection occurred.
- Created an appointment book to capture correspondences with residents including scheduling inspections

Cityworks Database Administrator; Philadelphia, PA

Mr. Peck focuses on database configuration and customization. He can heavily customizes Cityworks by creating procedures to push and pull data from other systems in order to increase the efficiency of the work flow, by ensuring data quality through standardization and quality control measures, and by creating avenues of communication such as reporting and emailing out of Cityworks.

CH2M | Asset Management Systems Administrator; Boston, MA

Mr. Peck manages and maintains CH2M's condition assessment tool, ACES. ACES consists of a Microsoft SQL database backend with an aspx website front end. Responsibilities include technical support during condition assessment projects, improving efficiency of the tool through customization of the SQL database and the website, and developing custom reports.

Shell Technology Center of Houston | Asset Manager/Project Manager; Houston, TX

Mr. Peck managed an asset management team to perform the building blocks of asset management which included definition of an asset, surveying assets in the facility, updating CMMS and developing preventative maintenance plans for assets collected for Shell. Specific tasks in this project were:

- Managed client meetings including creating bi-weekly summaries and updating the work plan and forecasting.
- Developed asset data collection tool to collect ~27,000 assets in two months found during a facility survey. This tool was also used for quality control and populating the upload templates need for the CMMS.
- Developed preventative maintenance collection tool to store and maintain ~200 preventative maintenance plans developed by the asset management team.

Dave Schobelock, PMP

Mr. Schobelock, Vice President of Project Delivery, is a seasoned professional with 26+ years of experience including serving as an Information Technology Manager and Consultant. He has demonstrated success in bringing projects to completion on time, within budget, and meeting functional requirements. He is particularly effective at defining business success criteria and developing business and system requirements along with proven ability to quickly understand and diagnose systems issues.

PROJECT EXPERIENCE

Broward County | New Client Services Management System (CSMS) Application

Project Manager. Managed development of a CSMS application for the Human Services Department. Integrated the entire client services and case management processes into a standardized flexible process to meet process improvement goals. Led JAD sessions, analyzed business processes and workflow, updated requirements, created use cases and developed design documentation.

Florida DOT | Integrated GIS Tool Project

Project Manager and Lead Business Analyst. Managed and oversaw FDOT's Integrated GIS Tool project. The project assessed client needs, designed and developed a GIS Geodatabase and interactive screens for storing, searching researching, and displaying boring data for District 6.

South Florida Water Management District (SFWMD) | Structure Inspection Program (SIP)

Senior Project Manager. Managed the SIP Business Analysis, Requirements, Application Design, and Development projects. Developed project schedule, created status reports, led progress meeting, managed project resources, and managed issues and risks. Provided oversight of application design and development including system and user acceptance testing and implementation.

South Florida Water Management District (SFWMD) | O&M Cost Estimating Tool Project

Project Manager. Managed the SIP Business Analysis and Requirements and Application Design and Development projects. Led business requirements effort, facilitated JAD and workshop sessions, developed specifications, created traceability log for requirements/specifications from business requirements through testing, led conceptual prototype development, and created high-level system design and implementation report.



Expertise:

Information Technology; Program Management; System Development Life Cycle; GIS Design & Evaluations; Engineering & Testing Projects; Client Server; Oracle; SQL; Custom Development; Case Management; Purchased Package Integration; Client Server; JAVA Web applications

Education

- MBA Courses, University of Alabama at Birmingham
- BIE, Industrial & Systems Engineering, Auburn University
- **Total Years of Experience** 26

Office Location Palm Beach, FL

South Florida Water Management District (SFWMD) | Canal Capacity Conveyance Program

Project Manager. Managed and oversaw the Business Analysis and Requirements project for the Canal Capacity Conveyance Program. Developed project schedule, created status reports, led progress meeting, and managed project resources. Led business requirements effort, facilitated JAD and workshop sessions, led system alternatives analysis and selection, and developed specifications.

South Florida Water Management District (SFWMD) | Map Modernization (FEMA) Evaluation Project

Project Manager/Analyst. Analyzed GIS management system including evaluation and recommendations for hardware, and provided data storage/software requirements.

Sandeep Jadala

Mr. Jadala is an experienced Software Engineer with 8 years of Software Development using .NET technologies and object oriented methodology. Strong experience in Business Process Analysis and Requirement Engineering and expertise in getting projects completed in very tight timelines. He has worked on projects for Broward County ISS Department, Florida DOT and the South Florida Water Management District.

PROJECT EXPERIENCE

Palm Beach County | Medical Examiner System

Senior Developer. The Medical Examiner system has been designed to assist the personnel in the Office of the Medical Examiner's Office in performing the tasks required to comply with Florida State Statute 406, Medical Examiners Act. Additionally, it will provide a broad range of detail and summary reports for statistical analysis to various organizations like various funeral homes, law enforcement, toxicology lab, state attorney. This system has three modules, Cremation case, Medical examiner case, HIPAA compliance documents interchange system. Cremations are retrieved periodically from EDRS (Electronic Death Record System) from State of Florida.

Palm Beach County | OSCARSS (Online System for Community Access to Resources and Social Services)

Senior Developer. The OSCARSS application is a secure web application for community services that provides public access through the Internet, for those individuals that need to apply for services. The objective would be to design one application capable of identifying the requirements for each service, and based on the needs and information provided by the applicant, determine the individual's eligibility for services and required supporting documentation. To complete the process, pre-qualified Individuals would register, upload electronic copy of required documents, and schedule appointments on-line. This application comprises of different modules like Basic Eligibility, Client's registration and account, Application process for needs, Scheduling, Processing of client's application.

Palm Beach County | Community Services Single-Sign On Application

Senior Developer. Community Services is a department of Palm Beach County which has several web applications and windows applications for their activities to provide service to residents of county. Every application managed its authentication and authorization. Community Services Single-Sign On application is to provide one place authentication and authorization of users from community services department and its agencies who use community services applications.



Expertise:

C#, VB.NET, SQL, C; Oracle12C/11g/10g, SQL Server; MS Access; .NET Framework; MVC2, WCF,WPF; XML Web Service; SOA; LINQ; Win Forms; MVC2/MVC3, MFC; XML; Component based n-Tier application development; SSRS, SSIS, Visual Studio 2008/ 2010/2012/2013; ADO.NET, ODBC; IIS, Apache Tomcat: MS-Dos. Windows XP/vista/Win7/Win10; Windows NT 4.0 Education: PowerDesigner; Balsamiq; Microsoft Expression Blend; Fiddler; Team Foundation Server; Waterfall; Agile; Scrum; RUP

Education

- MS, Business Information Systems, Melbourne, Australia
- BS, Electronics, JNTU, Hyderabad, India

Total Years of Experience 8

Office Location Palm Beach, FL