QUALIFICATIONS | RFQ 2017-017 | JULY 2017

Design Services for East Wastewater Treatment Plant Upgrade Engineering

carollo

Engineers...Working Wonders With Water®

Contents

DESIGN SERVICES for
East WWTP Upgrade Engineering

carollo
Engineers...Working Wonders With Water®

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July 11, 2017

Mr. Spencer Shambray, Purchasing Manager
City of Margate
City Hall, Finance Department
5790 Margate Boulevard
Margate, FL 33063

Subject: Qualifications Package for the City of Margate Design Services for East Wastewater Treatment Plant Upgrade Engineering, RFQ No. 2017-017

Dear Mr. Shambray:

The wastewater treatment needs in the City of Margate require that the East Wastewater Treatment Plant (East WWTP) take on substantially more of the overall treatment burden. You anticipated this need, and we worked with you from this project's inception, beginning with the IFAS process capacity evaluation and cost estimate in 2015 ... and we know how to deliver maximum capacity and long-term reliability at the lowest cost. Therefore, we are excited and well suited for this upgrade project.

Local Team with First-hand Knowledge. The team that embraced your challenges at the East WWTP and previously analyzed IFAS is returning to complete your project:

- Our process lead is *Rod Reardon*, a nationally-recognized wastewater process expert with more the 160 technical publications. Rod will once again drive the right technical solutions on the project. His knowledge on how to maximize the capacity of the East WWTP is unparalleled.
- The project engineer for the 2015 IFAS capacity evaluation, *Erica Stone*, returns to carry the project implementation through design and construction.
- The instrumentation and control and electrical lead for the East WWTP is once again in the expert hands of *Mario Gamboa*.
- New to the project is our Project Manager, *Randy Braley*, a Carollo vice president selected for this role having successfully delivered complex and critical wastewater projects.
- *Chen-Moore Associates,* a long-time Carollo partner whose quality work is well known to the City, will handle site civil and landscaping design activities.

Our Resource, Staff Availability, and Corporate Commitment. As your client service manager, I look forward to continuing our work together and fulfilling your vision for the East WWTP. I also represent Carollo on this project and pledge to deliver the staff named in our proposal to fulfill their described roles and responsibilities, and confirm they will be available to work the necessary time to succeed in their roles.

Our key team members are local and focus day-to-day on wastewater treatment in Southeast Florida, and more importantly on your project. We deliver the best of both worlds: a superior local team, backed by world-class Florida and national experts who specialize in serving governmental agencies.

Proactive Project Management. Your project requires diligent, multifaceted project management to deliver your desired capacity increase, on time and under budget, while enhancing your stakeholder and governmental relationships, expertly managing your risk, designing in quality for long-term reliability and flexibility, seeking win-win resolutions to conflicts, all tied together by open, proactive and trusting communication.

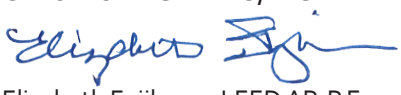
Treatment Value for the Money. The City recognizes the potential and need for the East WWTP to take a bigger role in the City's wastewater treatment. We will lead the effort to fulfill the East WWTP's potential to advance the overall capacity, reliability, and cost-effectiveness of the City's system.

The following table is a guide to finding the information needed to evaluate our proposal and confirm that we have exceeded your requirements.

	Proposal Section in Order	Evaluation Criteria	Location	Content
1	Cover Letter	5	Cover Letter	Includes Carollo's pledge to deliver the firm's resources, personnel availability and commitment to completion.
2	Checklist		Following Cover letter	Confirms all proposal components included.
3	Firm/Team Organization Chart	2,6	Starting on page 3-1	
4	Firm Description	3	Starting on page 4-1	Demonstrates success on governmental work.
5	Key Staffing	2,5	Starting on page 5-1	Continuity from prior IFAS project.
6	Project Management	1,3,4	Starting on page 6-1	Project Management 6a, and 6b (for 6b see 330 Form) .
7	Offeror's Certification and Non-Collusive Affidavit, Florida Certifications, and MBE Certification	6	Section 7	Meets all requirements.
8	SF 330 Forms	1,2,3	Section 8	
9	Additional RFQ Information		–	

We believe that when you review our qualifications and approach you will see a familiar and experienced team that blends intimate knowledge of your East WWTP and system needs with an ability to apply innovative technology. What does that yield? The right result, a cost-effective, reliable solution that will serve the City's long term wastewater needs. We look forward to discussing the next steps and serving you on this project.

Sincerely,
CAROLLO ENGINEERS, INC.



Elizabeth Fujikawa, LEED AP, P.E.
Vice President

Enclosures: Qualifications Package

EXHIBIT A

CONSULTANT CHECKLIST – RFQ 2017-017

NOTE:

A) This Exhibit must be included in RFQ immediately after the cover letter.

B) RFQ Package must be put together in order of this checklist.

C) Any supplemental materials must appear after those listed below and tabbed "Additional RFQ Information".

1. X Cover letter
2. X Copy of this checklist (Exhibit A)
3. X Firm/Team Organizational Chart
4. X Firm's Description(s) (Offeror's Qualification Statement)
5. X Key Staffing (Name, title and years with firm only. **Do not include a resume here.** All resumes, if included, should be included under "Additional RFQ Information" tab.)
6. X Project Management
7. X Offeror's Certification and Non-Collusive Affidavit Form
8. X SF 330 Forms

Key personnel from the Carollo team have the background and experience necessary to provide Design Services for the East WWTP Upgrade Engineering Project.

The Emphasis is on **"TEAM"**

> "Carollo fostered a team approach which built a strong partnership through trust and cooperation with all parties. This teaming approach delivered a high quality project in every aspect of the project."
>
> —David Cox, PE,
> Utilities Engineering Manager
> City of Olathe, KS

Firm/Team Org Chart

The Carollo team blends new talent with key members who served the City on previous projects and depth of experience with innovative wastewater technologies. Our team was crafted based on three critical strengths: **knowledge, innovation for a purpose,** and **local experience**.

RANDY BRALEY | Project Manager

Randy Braley, Senior Project Manager with Carollo Engineers, will be the main contact with the City of Margate.

Client Service Manager
Liz Fujikawa, PE, LEED AP, BCEE

Project Manager
Randy Braley, PE, BCEE

Project Engineer
Erica Stone, PhD, PE

Process Engineering / QA/QC
Rod Reardon, PE, BCEE
John Fraser, PE*
Bob Cushing, PhD, PE

Supporting Disciplines
Electrical and I&C Engineer | Mario Gamboa, PE
Structural Engineer | Joel Smason, PE
Site Engineer | Daniel Davila, PE[1]
HVAC | Chad Green, PE
Architect | Jeff Alband, RA*
Landscape Architecture | Chris Betancourt, RLA[1]
Permitting | Angelica Gregory, PE
Construction Manager | Terry Storck

All team members are with Carollo, unless otherwise noted.

1) Chen Moore Associates
* Licensed in a state other than Florida

Our team works day to day focusing on south Florida clients, including South Central Regional Wastewater Treatment Plant (SCRWWTP), South Florida Water Management District (SFWMD), Pompano Beach, Broward County, and Sunrise. We work closely with the permitting agencies, such as FDEP, FDOH, SFWMD, and are ahead of regulatory changes. Our proximity allows us to quickly respond to our clients needs. The team is already working together for Margate and have completed over 20 assignments since 2013.

Carollo's South Florida Clients

Carollo's history with SE Florida governmental agencies gives us a well-rounded perspective on the issues you face: permitting and approvals, the local construction market and cost fluctuations, I/I issues, ocean outfall regulatory challenges, and reuse opportunities, among others.

SFWMD
- C43 Reservoir Design & CMS
- Stormwater ASR Reactivation Design
- RO Concentrate Recovery Demonstration Pilot
- Everglades Restoration
- 450 CFS L-8 Reservoir PS & Inflow Structure
- Rolling Meadows Ranch Habitat Restoration
- Flow Diversion Structure Rehabilitation Design

Palm Beach County
- WTP 2 MIEX Addition
- WTP 2 Filter Replacement
- Optimization Studies for Membrane WTPs
- Water Master Plan Update
- WTP 3 and WTP 8 Improvements
- Copper Corrosion Study
- System-Wide Water Conservation Study
- Glades Region Water Master Plan

City of Boynton Beach
- D/B Ion Exchange WTP
- Utility-Wide Master Plan
- HVAC Assesssment

Broward County
- Storage Tanks and Pumping Stations - Design and Construction Management

South Central Regional Wastewater Treatment and Disposal Board
- Plant Wide Condition Assessment
- Assessment of Electrical Supply
- Bulk Hypochlorite Storage and Feed Facility – Design & CMS

City of Margate
- Hydraulic Modeling
- Water and Forcemain System Assesssment
- Water Main Improvements and Replacement
- IFAS Study

City of Pompano Beach
- Energy Master Plan
- Energy Optimization Upgrades Oversight
- Evaluation of Nanofiltration vs Lime Softening
- WTP Electrical Improvements
- Membrane Concentrate Disposal Study
- WTP Transfer Pump Station Improvements

City of Sunrise
- Springtree WTP Improvements
- Sawgrass WTP Expansion Study and Design
- Southwest WTP IX and Improvements

City of Plantation
- Digester Assessment for Co-Generation
- Pumps Speed Controller (VFD) Upgrade
- Reuse Treatment Facility Permit Renewal

City of North Miami Beach
- Lime Softening Feed and Storage Improvements
- Electrical System Evaluation

Miami-Dade County
- Design of High-Level Disinfection Facilities for 225-mgd South District WWTP
- Advanced WW Reuse Pilot Study
- Blending Evaluation
- Preston-Hialeah GWUDI Upgrades, New 165-mgd Nanofiltration Facilities

USACE, CERP
- Process design for Okeechobee 1,500-mgd ASR Program

Firm Description

Founded in 1933, Carollo has six offices in Florida, including in Broward County, and 42 offices throughout the U.S. All of our work is in water, resulting in a level of understanding of key supply, treatment, and conveyance issues that few can match. We apply sound, proven engineering principles to advance the application of water technologies and engineering excellence.

Consistent with our brand, we remain responsive to the needs of our clients as the industry leader in planning, permitting, design, and construction of facilities that reliably convey and treat wastewater across the U.S.

Innovation.
Innovation.
Innovation.
"From the start, they proved that they were innovative, had our best interests at heart, and continuously demonstrated their perseverance and resolve to deliver an exceptional work product."

– Sam Samandi, P.E. *Acting Engineering Manager*
City of Oklahoma City

RESOURCES

Carollo's staff numbers over 1,000 employees, including more than 450 registered engineers. We are a full-service firm with the experience and qualified professionals needed to successfully manage projects of any size. Our staff includes civil, sanitary, environmental, electrical, mechanical, chemical, structural, control system, and corrosion control engineers, as well as architects, planners, and specialists in other areas.

Your project will be led by Randy Braley, as Project Manager, and Liz Fujikawa, your trusted Client Service Manager from our Broward County office.

Carollo ranks number one among all design firms who work solely in water, based on Engineering News-Record's May 11, 2015 "Top 500 Design Firms" ranking.

Services Provided by Carollo

- Wastewater Master Planning
- Wastewater Treatment
- Wastewater Infrastructure
- Biosolids Management
- Water Reuse
- SCADA Programming Services
- Sustainable Design Services
- Renewable Energy Technologies
- Greenhouse Gas Monitoring and Reporting
- Geographic Information Systems
- Water Master Planning
- Water Treatment
- Water Infrastructure
- Combined Sewer Overflow/ Sanitary Sewer Overflow Facilities
- Applied Research
- Asset Management
- Financial Analysis
- Grant Funding Assistance
- Hydraulic Modeling
- Construction Management

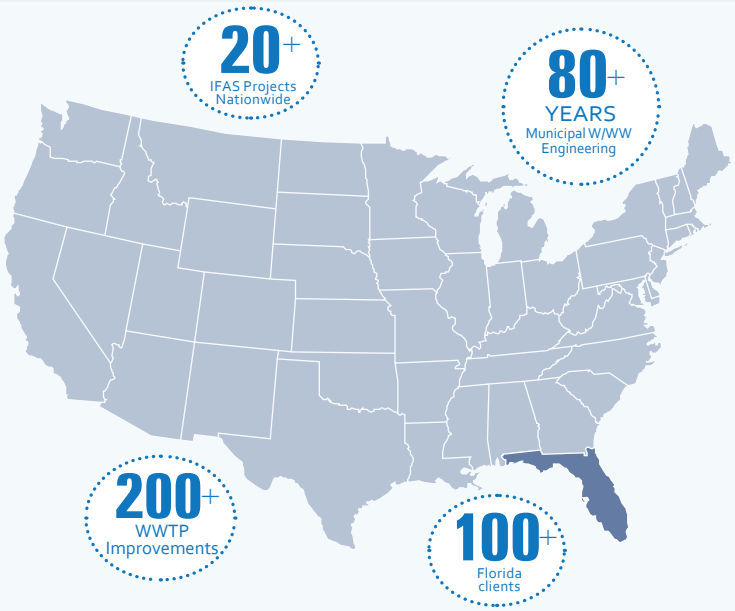
FLORIDA PRESENCE

Since the year 2000, Carollo has progressed from the new kid on the block in Florida to the preferred "go-to" firm for dozens of major client agencies; many of whom we work for via a continuing service contract, with nearly a 100 percent renewal rate. We believe the reason for this, rests not simply with the creative thinking we bring to the project or our depth of experience, but also with our focus on customer service. We listen carefully to our clients and their experiences, to understand their preferences, and then customize solutions to fit their needs.

We currently have six offices in Florida, located in Broward County, Palm Beach County, Miami, Orlando, Sarasota, and Tampa. Support from other offices across the country can be provided as appropriate. Our Florida offices are home to a group of highly talented and motivated individuals.

OUR HISTORY WITH THE CITY

Carollo has been serving the City of Margate since 2013 under a Continuing Services contract. We have successfully completed approximately 20 projects since then.



Carollo by the numbers...

Our combination of knowledgeable, highly motivated local staff, and dedicated firm-wide support makes certain the quality and responsiveness of our services are exceptional.

What Sets us Apart...

Carollo's Leadership in Wastewater

- We currently rank within the Top 10 firms for wastewater treatment, per the Engineering News Record 2016.
- We regularly present 20 to 25 technical papers related to wastewater at the Water Environment Federation Technical Exhibition and Conference. This is a testament to our efforts to be on the cutting edge of wastewater technology.
- Our people set us apart. From recent graduates to career professionals, Carollo employs some of the best engineers and scientists in the industry.

Carollo Has an Innovative Focus on Wastewater

Innovation is vital to all we do. We work tirelessly to advance the science and engineering of wastewater finding the most creative and technically sound solutions to fit your needs. Carollo dedicates funds annually to conduct leading edge research and development to advance the state of the water industry, and most importantly solve challenges for our clients.

Examples of the areas where we have applied innovative techniques and solutions include:

- Facilities Expansions
- Nutrient Removal and Recovery
- Improved Energy Management
- Sustainability of Resources
- Trace Organic Contaminant Mitigation
- Utility Management

WASTEWATER TREATMENT

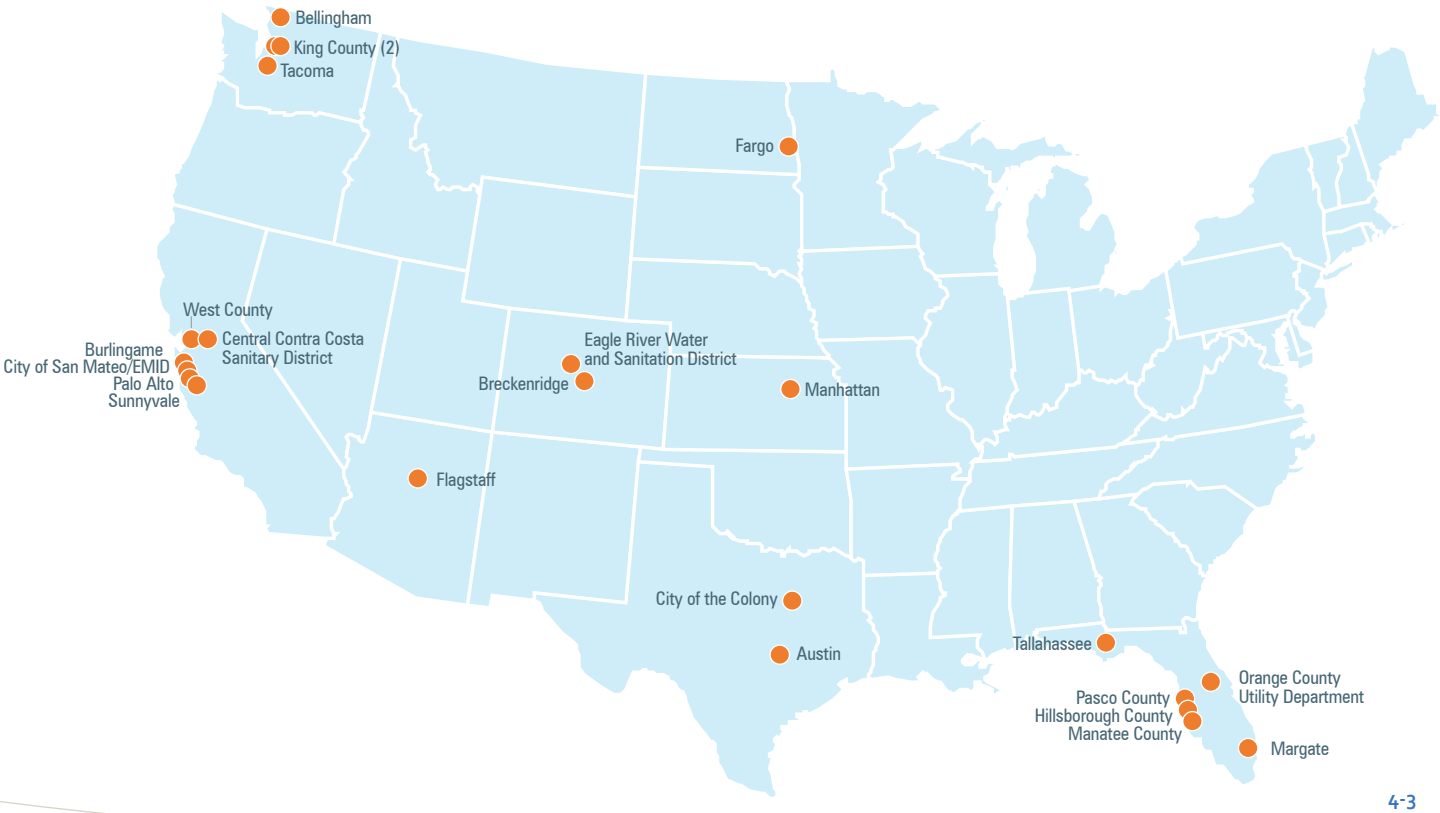
During our 84-year history, Carollo has designed new or improved facilities for more than 200 wastewater treatment plants. This experience includes planning, design, and construction management of the following treatment components:

- Headworks facilities, including influent screening, grit removal, and pumping.
- Primary clarification.
- Secondary treatment utilizing both fixed film and suspended growth treatment processes.
- Biological nitrogen and phosphorus removal.
- Disinfection using chlorine gas, sodium hypochlorite, and ultraviolet light (low and medium pressure, dechlorination.
- Biosolids pumping, thickening, digestion, dewatering, and reuse.
- Digester gas reuse.
- Odor control facilities.
- Water reclamation for agriculture, landscaping, industrial, and indirect and direct potable reuse.

Carollo has provided planning design services for improvements to wastewater treatment facilities ranging in size from less than 1 mgd to more than 600 mgd in capacity.

CAROLLO'S SPECTRUM IFAS EXPERIENCE

Carollo has a long history with IFAS technology. Since it was introduced, we have applied it nationwide. We understand the intricacies of applying the technology in a number of different applications and that understanding will give the City an optimum, functional, and successful system. Below you will find a map of Carollo's IFAS clients throughout the country.



Provided below is a table showing Carollo's history with SE Florida governmental agencies. Projects include water, wastewater, infrastructure, condition assessments and master planning. Carollo's work statewide for over 100 governmental clients translates to experience and knowledge that we will apply toward making the City's East Wastewater Treatment Plant capacity expansion project a success.

Representative Experience with Southeast Florida Governmental Agencies

Client	Representative Project	Highlights
City of Margate	2017 Water Main Improvements Design & CMS	• Water main replacement design of approximately 9,150 linear feet at various locations in the City.
	Aerial Crossing Condition Assessment	• Condition assessment for City's water and force main aerial canal crossings.
	Aerial Crossing Site Replacement	• Design services following the City's water and force main aerial canal crossings condition assessment.
	Design C14 Canal Water Main Crossing	• Design services to support the installation of approximately 2,350 linear feet of new 12-inch diameter water main to improve the level of service in the service area south of the C-14 Canal.
	NW 18th Street Forcemain	• Carollo provided over 2,000 linear feet of new sanitary sewer force main to reduce excessive velocities in existing force mains, to provide system redundancy when force main breaks occur, and to allow abandonment of existing failing force mains.
	Water and Forcemain System Assessment	• Water and force main system assessment.
	Water Main Improvements	• Water Main Replacement Design of approximately 11,500 linear feet at various locations in the City. Also includes design for abandonment of existing water mains.
	West River Drive and NW 58th Terrace Water Main Improvements	• Design services for the installation of approximately 3,000 linear feet of water main to improve the level of service in areas that experience frequent water main breaks.
Broward County	Design of Pumping Stations and Storage Tanks	• County-wide contract to design upgrades and new pump stations/ storage tanks. • Detailed design and construction. • FPL coordination. • Florida DOH permitting. • SFWMD permitting.
City of Pompano Beach	Electrical Master Planning and Upgrades	• Assessed existing facilities, created 20-year master plan.
	Blending Study at Reuse Treatment Plant	• Evaluated treatment of nanofiltration concentration at the reuse WWTP. • FDEP permit approval.

Representative Experience with Southeast Florida Governmental Agencies (Continued)

Client	Representative Project	Highlights
South Florida Water Management District	L-8 Pump Station	• Owner's representative for the new L-8 Pump Station and Reservoir. • Hydraulic analyses • Pump selection • Permitting
	C43 PS S-470 Pump Station Design	• Redesign of a 1500-cfs stormwater pump station for Everglades Restoration in South Florida.
	Canal ASR System Rehabilitation	• Design and engineering services (civil, mechanical, electrical, and instrumentation) and procurement assistance services to restore the Taylor Creek / Nubbin Slough Aquifer Storage and Recovery (ASR) system to operability.
	Compartment C ESDC	• Engineering services during construction of the civil works portion of the Compartment C Buildout project.
	Everglades Restoration Capital Project Resource Area Support Study	• Project management, technical, design, and administrative personnel resources to meet the ERCP Project Teams' activities.
	L-8 Reservoir Intake Structure and Pump Station Study	• Carollo's services for the D/B Owner's Advisor role include assisting with the following: • Development of technical criteria to be used in design and construction. • Management of contractor procurement. • Technical review during design. • Local, state, and federal permitting. • Inspection and engineering services during construction.
	Field Station Building B47 Replacement	• Developed civil, architectural, structural, HVAC, and electrical designs. • Prepared Civil, Drainage, and Fire Protection and Detection Drawings.
	Structures Rehabilitation D-8	• Prepared construction drawings, technical specifications, design reports, and cost estimates for the repairs.
	Taylor Creek/L-63N Canal ASR System Reactivation	• Pilot testing and conceptual design for the disinfection and treatment of the Taylor Creek L-63N Canal water.
	Water Desalination Concentrate Management and Piloting Study	• Review of South Florida RO concentrates and classification, permitting assessments, and cost estimates; and pilot-scale demonstration of increased recovery from 75 to 88 percent.
Palm Beach County	Design of Improvements to Multiple Treatment Plants	• Assessed existing facilities and capacities, evaluated alternatives, designed improvements. • Detailed design and construction. • Evaluation of treatment processes for capacity and future regulations. • Permitting.
City of Boynton Beach	Master Planning for Water, Sewer, Reuse, Stormwater	• Condition assessments, modeling, created 20-year master plan. • Evaluated treatment processes for capacity and future regulations.
	HVAC Analysis at West WTP	• Evaluated existing systems and alternative for a centralized chiller system. • HVAC upgrades to electrical and mechanical process rooms.
	Progressive D/B of MIEX System	• Added pretreatment to existing plant. • Hydraulic analysis. • Process analysis. • Design and CM.

Representative Experience with Southeast Florida Governmental Agencies (Continued)

Client	Representative Project	Highlights
South Central Regional Wastewater Treatment and Disposal Board	Master Planning and Condition Assessment	• Conducted plant wide assessment to create 20-year master plan • Maximized use of existing facilities • Evaluated treatment processes for compliance with future regulations and capacity needs
	Electrical Assessment	• Evaluated alternatives for power supply • Maximized use of existing facilities
City of Sunrise	Multiple Treatment Plant Expansion Projects	• Capacity upgrades, chemical feed systems, detailed design • Detailed design and construction • Hydraulic analyses • Process improvements • Permitting
Miami Dade County	Onsite Hypochlorite Generation System	• Process selection and detailed design • Detailed design & construction • Process improvements • Permitting
North Miami Beach	Sunshine Force Main Replacement	• Design and construction management of a new force main • Detailed design and construction • Permitting • Staging to avoid service disruptions

Carollo is proud of our relationship and long-standing history providing water and wastewater services throughout Florida, for more than 16 years . **The map on the following page demonstrates our extensive municipal water and wastewater utility project experience in the Sunshine state!**

carollo
rs...Working Wonders With Water®

The Choice for Municipal Water/Wastewater Utilities Throughout Florida

City of St. Petersburg
- SWWRF Thickening Improvements
- NEWRF Dewatering Process Selection
- Conceptual Design of Two-Phase Digestion at SWWRF & NEWRF
- SWWRF Plant-Wide Electrical Upgrade
- AWWRF Clarifier Upgrades
- NEWRF Headworks Odor Control
- Lift Station Condition Assessments
- NEWRF Improvements
- SWWRF Solids Thickening Improvements

Pasco County
- Facility Plan and Expansion of the Wesley Center WWTP
- Wastewater System Hydraulic Model

Bay County
- North Bay WWTP Permit Renewal
- Military Point AWTP Asset Replacement Plan

City of Tallahassee
- WW Treatment Master Plan
- TPS & LBR WWTFs Preliminary Design
- LBR Improvements Design
- LBR WWTF Upgrades
- Phosphorus Removal Evaluation

Orange County
- AwwaRF Project 2639, Public Perception of Tap Water Chlorinous Flavor
- Program Management for Water & Wastewater Services
- South WRF Biogas to Energy Feasibility Study
- Northwest WRF Phase III Improvements Value Engineering
- Southwest WRF Conceptual Design Facilities Plan Update
- Demonstration of 4-log Virus Treatment at Water Supply Facilities
- Disk Filter Evaluation Study
- SWRF Asset Management Evaluation

JEA
- WWTP Optimization/Efficiency Studies
- WWTP Reliability Study
- WWTP Mixing & Oxygen Transfer Studies
- UV Performance Evaluations
- UV Optimization Study
- Buckman WRF Disinfection Improvements

City of St. Augustine
- AWT Plant Upgrade and Expansion

City of Palm Coast
- WTP Expansion

City of Daytona Beach
- Bethune and Westside WWTF Process Optimization
- Wastewater Filter Evaluation
- WWTP Permit Renewals
- WRWRF UV System Audits
- Emergency Generator System Design
- WRWRF Phase 3 Improvements

Haines City
- Water Reclamation Facility Repermitting

Citrus County
- Brentwood WWTP Expansion

City of Orlando
- Iron Bridge WRF Noise Abatement Study
- Conserv II WRF Biosolids Dewatering Improvements
- Wastewater Financial Forecast and Rate Study
- Lake Nona Reuse Main Replacement

Indian River County
- Water Quality and Corrosion Control Study
- Domestic Water Quality Complaint Support
- Force Main Condition Assessment
- Manhole Rehabilitation

City of Tampa
- Tampa Augmentation Program (TAP)
- David L. Tippin Water Master Plan

Toho
- Centrifuge Study
- Harmony WTP MIEX System Evaluation

Altamonte Springs
- Potable Reuse Pilot Study

Tampa Bay Water
- Well Permitting
- Chemical Feed System Design
- Standby Power Generation Project
- Asset Management Program Development
- Lithia WTP Owner's Engineer
- Morris Bridge Booster PS Energy Audit
- US 41 & Odessa Booster PS Rehabilitation

SFWMD
- C43 Reservoir Design & CMS
- Stormwater ASR Reactivation Design
- RO Concentrate Recovery Demonstration Pilot
- Everglades Restoration
- 450 CFS L-8 Reservoir PS & Inflow Structure
- Rolling Meadows Ranch Habitat Restoration
- Flow Diversion Structure Rehabilitation Design

Palm Beach County
- WTP 2 MIEX Addition
- WTP 2 Filter Replacement
- Optimization Studies for Membrane WTPs
- Water Master Plan Update
- WTP 3 and WTP 8 Improvements
- Copper Corrosion Study
- System-Wide Water Conservation Study
- Glades Region Water Master Plan

Pinellas County
- FOG Digestion Study at South Cross Bayou WRF
- Interceptor Odor/Corrosion Control Study
- South Cross WRF Advanced Digestion
- Biological Nutrient Removal and Digestion Optimization Study and Design
- South Cross Bayou WRF Acid Phase Digestion Modifications

Hillsborough County
- Bond Engineer
- BiAnnual Facility & Operations Reviews
- Valrico AWTP Regulatory Compliance Facilitation
- Northwest Consolidation Program Development and Owner's Advisor
- CIP Meeting Assistance / CIP Prioritization Tool
- NWSA Surface Water Discharge Elimination Program
- Pipeline Cost Estimating Tool
- SCADA Master Plan
- Biosolids Master Plan
- Feasibility Report for 2016 Bonds

City of Boynton Beach
- D/B Ion Exchange WTP
- Utility-Wide Master Plan
- HVAC Assesssment

Broward County
- Storage Tanks and Pumping Stations - Design and Construction Management

South Central Regional Wastewater Treatment and Disposal Board
- Plant Wide Condition Assessment
- Assessment of Electrical Supply
- Bulk Hypochlorite Storage and Feed Facility – Design & CMS

City of Margate
- Hydraulic Modeling
- Water and Forcemain System Assesssment
- Water Main Improvements and Replacement
- IFAS Study

e County
- eer of Record Services
- main 1A Replacement
- County RO WTP BDR Peer Review
- 8 Booster Pump Station Improvements
- Terrace Waterline Replacement
- ore on the Lakes Waterline Replacement
- water Facilities and Collection System
- r Plans
- r Lift Station Asset Replacement Plan
- main and Valve Asset Management
- am
- RF Process Modifications for
- en Removal
- RF Clarifier Rehab Design
- tee WTP Filter Upgrades
- water Facilities Permitting
- Biological Roughing Filter BODR
- NFPA 70E Assessments
- l Facility Reviews
- RF Electronic O&M Manual
- and WRF SCADA Evaluations
- S/Asset Management Needed Analysis
- oftware Procurement Assistance
- r Reuse System Permit Renewal

Sarasota County
- Engineers Reports for Funding Bonds
- Central County WRF Expansion (Phases 2, 3 & 4)
- Water Supply Master Plan Updates
- Venice Gardens RO WTP Expansion
- Carlton WTP Master Plan
- Dona Bay/Cow Pen Slough Treatability Analysis
- Water Demand Projection Tool
- Water Planning Areas GIS Development
- Siesta Key Water System Evaluation
- Water Supply Facilities Work Plans
- Water Model Conversation & Calibration
- Joint Model Development & Analysis with Manatee County

WateReuse Research Foundation
- Reclaimed Water ASR-Potential Changes in Water Quality

City of North Port
- New Panacea WRF
- Intake Pump Station Design
- Myakkahatchee Creek WTP Improvements
- Annual Wellfield Report

City of Punta Gorda
- Shell Creek WTP Rerating and Design
- Water Supply Master Plans
- Water/Wastewater Master Plan
- Wastewater Plant O&M Manual
- Lift Station 14 Preliminary Design
- Reuse Feasibility Study
- Inflow & Infiltration Study
- WWTP Permit Renewals
- WWTP Tertiary Filtration Evaluation
- Biosolids Site Permit
- DIW Permit Renewals

Lee County
- Engineer of Record
- Pinewood RO WTP Design-Build Expansion
- North Lee County RO WTP Expansion
- Automatic Meter Reading Study
- North Lee County RO WTP Acid Feed System

Collier County
- North County RO WTP SCADA Upgrade
- Northeast WRF and WTP Design
- North County RO High TDS Treatability Study
- Water Model Upgrade & Calibration
- Irrigation Quality (Reuse) Model Upgrade & Calibration
- Real-time Modeling Program Development

City of North Miami Beach
- Lime Softening Feed and Storage Improvements
- Electrical System Evaluation

City of Pompano Beach
- Energy Master Plan
- Energy Optimization Upgrades Oversight
- Evaluation of Nanofiltration vs Lime Softening
- WTP Electrical Improvements
- Membrane Concentrate Disposal Study
- WTP Transfer Pump Station Improvements

City of Sunrise
- Springtree WTP Improvements
- Sawgrass WTP Expansion Study and Design
- Southwest WTP IX and Improvements

City of Plantation
- Digester Assessment for Co-Generation
- Pumps Speed Controller (VFD) Upgrade
- Reuse Treatment Facility Permit Renewal

Marco Island
- Florida Water Services Marco Shores WTP

Miami-Dade County
- Design of High-Level Disinfection Facilities for 225-mgd South District WWTP
- Advanced WW Reuse Pilot Study
- Blending Evaluation

Peace River Manasota Regional Water Supply Authority
- Integrated Loop Feasibility Study
- Integrated Loop Phase I Design
- Phase 3A Pump Station

Carollo understands the unique considerations of this project and will apply knowledge of your facilities and incorporate lessons learned from previous experience to benefit the Project.

SECTION 5

Key Staffing

We have assembled a locally-based team of experts in the engineering and construction of wastewater facilities with a long history of working throughout the state of Florida. Several of our key team members are familiar faces to Margate, since they have been involved with previous projects for the City.

Liz, Rod, Erica, and Mario are familiar faces to the City. They know your facilities and City staff. Moreover, they have analyzed Margate's future needs, the influential water quality variations, the existing treatment plant and processes, its existing performance, the hydraulic profile, the electrical system, and potential setting for implementation of the plant upgrades.

Our project manager, Randy Braley, was selected for this project considering his vast experience managing complex and challenging projects including numerous wastewater treatment plant upgrades. He is now well versed in the challenges faced by the City at the East Wastewater Treatment Plant.

Benefits of Our Team

- ✓ **Continuity**—a core team with a successful track record working together on similar projects—many of them in Florida.
- ✓ **History**—deep knowledge of your plant facilities. Our key team members have served on previous projects for the City.
- ✓ **Experience**—direct and relevant expertise to overcome challenges anticipated on this project.
- ✓ **Knowledge**—this team is very familiar with your project. Moreover, key team members were involved in the project that was the precursor to this one.
- ✓ **Service**—The majority of our team members live and work in Florida.

Additionally, Carollo has teamed with **Chen Moore**, a talented, local subconsultant who has experience working with Margate as well.

Background and relevant experience of our key team members is provided on the following pages.

Randy Braley, PE, BCEE

Project Manager

Randy, a vice president, has 35 years of experience as a manager for challenging wastewater projects across the U.S. His work in Florida includes wastewater projects for the municipalities of St. Petersburg and Pompano Beach, and the South Central Regional Wastewater Treatment and Disposal Board serving Boynton Beach and Delray Beach.

MEETING YOUR REQUIREMENTS

Years with Firm: 6 months
Availability: 65%

Wastewater design and project management experience includes secondary and nutrient removal treatment projects for the Naval Facilities Engineering Command at Camp Pendleton, CA; South Essex Sewerage District and Massachusetts Water Resources Authority, MA; and eight water and wastewater treatment plants in Egypt. He brings extensive expertise as the design project manager for major wastewater projects, program manager for a $450 million water reclamation public-private partnership, and project manager for integrated design-build teams.

Relevant Experience

- Manager for the design development of upgraded and new wastewater treatment facilities for the $190M Marine Corps Base Camp Pendleton Design-Build Program, Naval Facilities Engineering Command (NAVFAC), CA.
- Project director for the innovative MBR JAFZA Water Reclamation Facility, Dubai, United Arab Emirates.
- Project director/program manager for the $450M Sulaibiya Water Reclamation Facility, Build-Operate-Transfer (BOT) project, Kuwait.
- Project director for BNR and reuse Wadi Mousa Wastewater Treatment Plant (Jordan) funded by the United States Agency for International Development.

Liz Fujikawa, PE, LEED AP, BCEE

Client Service Manager

Liz, a vice president, has more than 30 years of engineering experience. She has served in roles ranging from project manager to technical specialist. She is a Professional Engineer in FL, DE, IL and WI. She is a principal-in-charge for municipal clients. Her broad range of experience will be an asset to your Design Services for East WWTP Upgrade Engineering.

MEETING YOUR REQUIREMENTS

Years with Firm: 6
Availability: 10%

Relevant Experience

- Client service manager for the East Wastewater Treatment Plant IFAS Evaluation for the City of Margate, FL.
- Client service manager for a plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board, FL, South Central Regional Wastewater Treatment Plant.
- Project manager for a Bulk Sodium Hypochlorite Storage and Feed Facility for the South Central Regional Wastewater Treatment and Disposal Board, FL, South Central Regional Wastewater Treatment plant.
- Project manager for the City of Pompano Beach, FL, Electrical System Master Plan.

Erica Stone, PhD, PE

Project Engineer

Dr. Stone possesses a PhD in environmental engineering and brings several years of experience with her in the areas of treatment plant upgrades, water quality, water treatment, environmental studies, sampling, research, and data analysis.

MEETING YOUR REQUIREMENTS

Years with Firm: 8
Availability: 70%

Relevant Experience

- Project manager/project engineer for the East Wastewater Treatment Plant IFAS Evaluation for the City of Margate, FL.
- Project engineer for Orange County Utilities, FL, Eastern Water Reclamation Facility Plan.
- Project manager and project engineer for the City of Orlando, FL, Conserv II WRF Effluent Analyzer Storage Improvements project.
- Project engineer for the Northwest Service Area Discharge Elimination planning for Hillsborough County, FL.

Rod Reardon, PE, BCEE

Process Engineering / QA/QC

Mr. Reardon is an environmental engineer with 38 years of experience in the study, design, and operation of municipal wastewater facilities. He has particular expertise in advanced wastewater treatment processes, including membrane technologies, for the removal of nutrients, evaluation of IFAS at plants in Florida and nationally, and for producing reclaimed water fit for various types of reuse.

MEETING YOUR REQUIREMENTS

Years with Firm: 11
Availability: 25%

As Carollo's National Wastewater Technology Leader, Mr. Reardon is responsible for a wastewater technology team that manages acquisition, compilation, transfer, and consistent application of wastewater processes and technology throughout the company. For specific projects, he performs as project manager/engineer or as process specialist.

Relevant Experience

- Process engineer for the East Wastewater Treatment Plant IFAS Evaluation for the City of Margate, FL.
- Process specialist for numerous projects that involved IFAS nationwide, including the City of Tallahassee, Florida, Lake Bradford Road Water Reclamation Facility Improvements.
- Technical Advisor/Process engineer for South Central Regional Wastewater Treatment and Disposal Board, FL, Miscellaneous Projects.

John Fraser, PE*

Process Engineering / QA/QC

Mr. Fraser is the Wastewater Practice Lead for Carollo. He has been involved in the preliminary and final design of numerous treatment facilities throughout the country. Facilities designed under Mr. Fraser's direction range in capacity from small 1.0-mgd plants to facilities treating over 300 mgd. Project costs range from less than $1 million to over $50 million and cover all aspects of wastewater treatment and solids handling.

MEETING YOUR REQUIREMENTS

Years with Firm: 31
Availability: 10%

Relevant Experience

- Technical advisor for the City of Colony, TX, IFAS Evaluation.
- Technical advisor for several IFAS projects across the nation.
- Project manager for the preliminary and final design of Denver Colorado's, Metro Wastewater Reclamation District (MWRD) South Secondary Improvements Project.
- Project manager for the $55 million Metro Wastewater Reclamation District PAR 942 North Secondary Treatment Improvements Project, Denver, CO.

Bob Cushing, PhD, PE, BCEE

Process Engineering / QA/QC

Dr. Cushing is a senior vice president with Carollo. He has 27 years of experience in applied environmental science and engineering. Throughout his career, he has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects, as well as studies and programs for improving distribution system water quality.

MEETING YOUR REQUIREMENTS

Years with Firm: 19
Availability: 10%

As an example of his leadership skills and dedication to the region, Bob successfully organized and led the establishment of Florida Section AWWA (FS/AWWA) Region 10. Through its success, Region 10 has become a model for other FS/AWWA regions.

Relevant Experience

- Principal-in-charge for Hillsborough County, FL, Northwest Regional WRF (30 mgd) – Strategic Implementation Plan. This project evaluated IFAS as one of the process alternatives for the existing plant.
- Principal-in-charge for Sarasota County, FL, Central County Water Reclamation Facility Design (Multiple Phases).
- Principal-in-charge for Manatee County, FL, Southwest Water Reclamation Facility Improvements.

Mario Gamboa, PE

Electrical and I&C Engineer

Mario has 36 years in design; value engineering; engineering management, construction management of numerous municipal, industrial and commercial projects. These include expertise focus with electric energy and automation for water treatment and wastewater treatment plants.

MEETING YOUR REQUIREMENTS

Years with Firm: 20
Availability: 60%

Relevant Experience

- Electrical and I&C engineer for the City of Margate, FL, Evaluation of East Wastewater Treatment Plant Upgrade using IFAS Technology.
- Electrical and I&C engineer for the South Central Regional Wastewater Treatment and Disposal Board, FL, Miscellaneous Projects.
- Electrical and I&C engineer for Sarasota County, FL, Central County Water Reclamation Facility Design (Multiple Phases).
- Electrical and I&C engineer for Manatee County, FL, Southwest Water Reclamation Facility Improvements project.

Joel Smason, PE

Structural Engineer

Joel has 40 years of experience as a structural design engineer for water and wastewater treatment plants and nuclear power plant design. As a senior structural design engineer, his responsibilities include preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications.

MEETING YOUR REQUIREMENTS

Years with Firm: 21
Availability: 60%

Relevant Experience

- Structural engineer for the City of Margate, FL, Evaluation of East Wastewater Treatment Plant Upgrade using IFAS Technology.
- Structural engineer for the South Central Regional Wastewater Treatment and Disposal Board, FL, Miscellaneous Projects.
- Structural engineer for Pasco County, FL, Wesley Center Wastewater Treatment Plant Rehabilitation Expansion.
- Structural engineer for Manatee County, FL, Southwest Water Reclamation Facility Improvements.
- Structural engineer for Sarasota County, FL, Central County Water Reclamation Facility Design (Multiple Phases).

Daniel Davila, PE

Site Engineer / Landscape Architect

Mr. Davila has over 18 years of civil engineering experience. His experience includes water and wastewater facilities, facilities planning, utilities master planning, infrastructure renewal, construction management and rate and financial studies. Mr. Davila has been the contract manager for several government agencies including St. Lucie County; City of Plantation; Village of Wellington; City of West Palm Beach; and Palm Beach County.

MEETING YOUR REQUIREMENTS

Years with Firm: 6 years with Chen Moore Associates
Availability: 60%

Relevant Experience

- Engineer-of-record for the DB 24" Force Main & 30" Water Main Canal Crossing, Margate, FL. CMA was the engineer-of-record on the design build team for the installation of a 24-inch force main and 30-inch water main canal crossing.
- Civil/Site development engineer for the Broward County, FL, BC-Potable Water Storage Tanks and Pumping System. Chen Moore is serving as subconsultant to Carollo on this project.
- Civil/Site development engineer for the Broward County, FL, BC -Potable Water Storage Tanks - Ph II & III. Chen Moore is serving as subconsultant to Carollo on this project.

Chad Green, PE

HVAC

Chad, a senior building mechanical engineer with Carollo, has 8 years of engineering experience in various building mechanical designs for water and wastewater facility projects as well as odor control and fuel systems. As a building mechanical engineer, he provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems.

MEETING YOUR REQUIREMENTS

Years with Firm: 4
Availability: 60%

Relevant Experience

- HVAC/Mechanical engineer for the Pasco Wesley Center WWTP Rehabilitation Expansion. IFAS was evaluated as part of Preliminary Design.
- HVAC/Mechanical engineer for the Manatee County, FL, Southwest Water Reclamation Facility Improvements.
- HVAC/Mechanical engineer for the Sarasota County, FL, Central County Water Reclamation Facility Design (Multiple Phases).
- HVAC/Mechanical engineer for the Orange County Utilities, FL, Program Management Wastewater Services.

Jeff Alband, RA*

Architect

Jeff, a senior architect with Carollo, has more than 46 years of experience in the architectural design, planning, detailing and specifications of water and wastewater treatment plants. Jeff works closely with our engineering staff to develop architectural concepts for structures with low-visibility from surrounding neighborhoods, and a low-profile design to blend in visually in with surrounding terrain.

MEETING YOUR REQUIREMENTS

Years with Firm: 38
Availability: 60%

Relevant Experience

- Architect for the Pasco Wesley Center WWTP Rehabilitation Expansion.
- Architect for Orange County Utilities, FL, Program Management Wastewater Services.
- Architect for the City of Boynton Beach, FL ion exchange water treatment plant.
- Architect for the City of Pompano Beach, FL transfer pumping station project.

Angelica Gregory, PhD, PE

Permitting

Dr. Gregory is a civil and environmental engineer with 14 years of combined experience in the water and wastewater consulting industry and in environmental engineering research. She has been involved with several permitting projects in Florida.

MEETING YOUR REQUIREMENTS

Years with Firm: 6
Availability: 25%

Relevant Experience

- Permitting specialist for projects in Broward County, and the Cities of Pompano Beach and Sunrise.
- Project engineer for a treatment facility condition assessment for the South Central Regional Wastewater Treatment and Disposal Board, FL.
- Project engineer and assistant project manager for the wastewater, water, and reclaimed water systems hydraulic modeling component of the Boynton Beach, FL, Utilities Management Optimization Plan.

* Licensed in a state other than Florida

Terry Storck

Construction Manager

Terry has more than 23 years of experience with a background that focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas

MEETING YOUR REQUIREMENTS

Years with Firm: 4

Availability: 80%

Relevant Experience

- Senior Project Representative and Senior Inspector for the South Florida Water Management District Reservoir, Pump Station and Inflow Structure. Responsibilities include overseeing civil, mechanical, electrical and controls inspections in accordance with approved submittals, plans and specifications. In addition, he performs the on-site quality verification process of new construction.
- Construction project manager and senior inspector for Sarasota County FL. Performed project responsibilities on Lemon Bay/ Roberts Bay Sediment and Erosion projects.
- CEI Project engineer/senior inspector for the South West Florida Water Management District Lake Hancock Drainage Control Structure/Station.

Innovation.
Innovation.
Innovation.

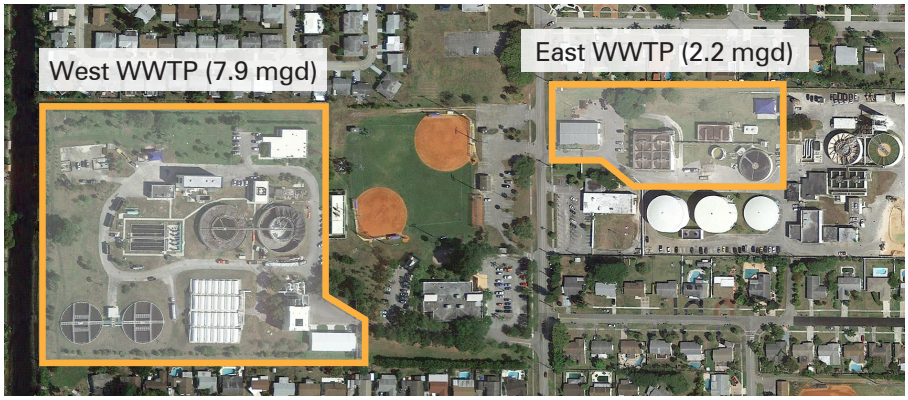
"From the start, they proved that they were innovative, had our best interests at heart, and continuously demonstrated their perseverance and resolve to deliver an exceptional work product."

– Sam Samandi, P.E.
Acting Engineering Manager
City of Oklahoma City

Project Management

Carollo's innovative application of leading edge and cost-effective technologies enables the East Wastewater Treatment Plant (East WWTP) to greatly increase capacity, enhance long-term reliability, and provide treatment flexibility to accept its ever increasing overall wastewater treatment role for the City of Margate's Department of Environmental and Engineering Services (City).

The City's 7.9-mgd West Wastewater Treatment Plant (West WWTP), centered on a rotating biological contactor (RBC) secondary treatment process, is facing rapid attrition of its RBC units through old age, thus permanently reducing treatment capacity. In response, the City must increase the treatment capacity of the 2.2 mgd East WWTP to meet overall City wastewater treatment needs. With the need to transition liquid treatment roles in the City, the East WWTP needs to be flexible to handling as much flow as possible, and meet potentially nutrient removal.



At the East WWTP, adding every drop of capacity possible as it becomes a long-term treatment work-horse must be accomplished at the lowest life-cycle cost. Additionally, optimizing plant-wide liquid and solids treatment requires the two plants to work cohesively as the East facility takes up slack from the West. In principle, the more treatment accomplished by the East WWTP the better.

6.a PROJECT MANAGEMENT APPROACH

Delivering a desired 4.0 mgd or more of treated wastewater from the East WWTP requires a clear vision of flowing clean water supported by the detailed logic and steps to achieve that vision. Our project manager, Randy Braley, shares that vision and will effectively communicate that vision to the entire team.

Critical to addressing the major elements of project management is the Work Breakdown Structure (WBS). You and our team will see and understand the detailed WBS so that there is no uncertainty or divergent efforts to delivering the most capacity at the lowest possible cost. The WBS, to be finalized during the planning phase for the project, is summarized by the **high level** tasks presented in the project schedule excerpt in Figure 1.

The Project Management Approach section of the proposal explicitly presents the features and direct benefits of our approach to managing the project as required in RFQ Section 6.a, and describes our firm's specific experience and expertise on similar projects as required in RFQ Section 6.b. The Project Management Approach section is organized as follows:

6.a.1 Decision-Making and Project Planning

The schedule with WBS tasks shows critical decision-making milestones including the early planning milestones for the City that set the direction of the project. We will facilitate these early decisions through the Project Planning Workshop that affirms goals, sub-goals, and identifies critical success factors for project success. The agenda for the workshop is:

- Affirm project goals
- Establish critical success factors
- Establish priorities in concise action plans
- Adjust schedule for any new or modified action plans with schedule and decision making milestones.

The results of the workshop; decision-making milestones; and affirmation of scope, budget and schedule will be documented in the Project Management Plan. While there will be several project team members who are "owners" of action plans, the Project Manager will be accountable for overall delivery of the Project.

One critical early decision for the City is whether to: 1) move forward with integrated fixed-film activated sludge (IFAS) implementation to increase capacity at the East WWTP from 2.2 mgd to 4.0 mgd following the City and Carollo evaluations; or 2) conduct an assessment of other technologies and possibly utilize another technology to maximize the capacity of the East WWTP beyond 4.0 mgd and take a comprehensive look at the City's East and West facilities. Both approaches provide capacity benefits; however, determining the most reliable, long-term overall approach requires further development. A short, concise city-wide capacity study task would add only 28 calendar days to the design schedule.

WBS	Task Name	Duration
1	**Project Planning**	**38 days**
1.1	Notice to Proceed	1 day
1.2	**Project Planning**	**32 days**
1.2.1	Project Workplan	15 days
1.2.2	Workshop	2 days
1.2.3	Risk Management Plan	5 days
1.2.4	Action Plan Development	15 days
1.3	**Project Management Plan**	20 days
2	**Design Criteria Confirmation**	**32 days**
2.1	WWTP Flows and Load TM	10 days
2.2	Plant-wide Capacity Study (optional)	20 days
2.3	Path Decision	7 days

Figure 1. Project Planning High Level WBS.

We will engage the City continuously to support it in other project decisions through the progression of project design and construction. Carollo is prepared to make the decisions necessary to move the project forward with success, and if invited, we will collaborate on decisions that by definition are the City's. In every case, we will prepare the information appropriate and necessary for a decision, including:

- Performance capability
- Capital costs
- O&M costs and life cycle costs
- Reliability, flexibility and durability
- Ease of operation

6.a.2 Ever-present and Open Communications

Proactive, thorough, open, and trusting describe our commitment to communications with you and within our team. Our communications with you will be both structured and informal. We will be meeting with you monthly to review project schedule and budget progress, discuss project issues and mitigation measures, and conduct a 6-week schedule look-ahead during design and construction to anticipate and address potential implementation roadblocks. During intense project periods, meetings may be scheduled more frequently to stay ahead of the pace of the Project.

In addition to the Communications Plan, a basic tool to be rigorously applied is a decision log; a rolling means to identify project issues that need addressing with assigned due dates and responsibilities. The decision log will be reviewed diligently on a weekly basis, and more frequently as needed.

Informal communications will be frequent and we encourage contact to be initiated by the City, as well as, Carollo. The Project Planning Workshop will lead to development of a clear Communications Plan with guiding protocols for communication pathways and media. Our Carollo internal team communications will follow the same core principles as our communications with you.

On behalf of and as agreed with the City, Carollo will reach out early to other project stakeholders, including other governmental agencies and utilities, such a permitting and approval agencies and maintain steady dialog facilitating an understanding of issues and expedited approvals.

6.a.3 Maintain Schedule…Maintain Success

Aggressive Management. Accepting 4.0 mgd or more of wastewater at the East WWTP as soon as possible provides an immediate reduction in the risk to the City for treatment shortages at the West WWTP, and enables the City to receive plant-wide O&M benefits ASAP. To make sure these tangible results are realized by the City, we will aggressively manage the design schedule and then construction schedule. Randy Braley, our project manager, will use the schedule daily to measure progress and earned value on the project, and adjust course as necessary. A preliminary schedule is presented in Figure 2, on the next page.

The project schedule will be a focal point for the 6-week look-ahead activity to identify and mitigate schedule disruption as much as possible.

MOPO. From inception of the design, attention will be given to laying out facilities to enable construction sequencing that minimizes loss of treatment capacity during construction and prevents adverse impacts to treated effluent. A maintenance of operations (MOPO) plan and schedule will be developed to document recommended construction sequencing.

6.a.4 Budget…Treatment Value for the Money

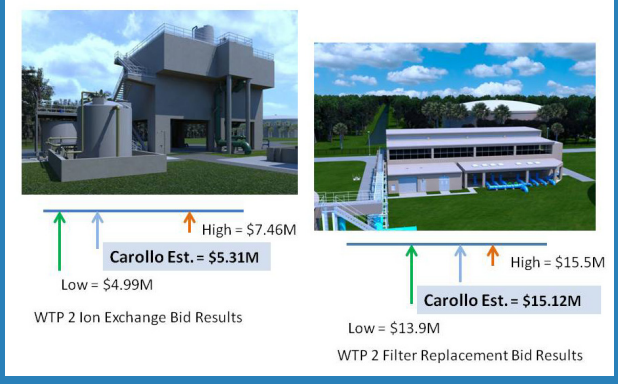
Putting every nickel to its best use on the overall project is a priority. Stated another way, every decision we make during the design phase and then during the construction phase will look to maximize the treatment results for your money expended. Initial costs are important as they may be limited by available funds, O&M and life-cycle costs are important to the long-term health of the City and your customers as we know cumulative long-term cost savings may overwhelm initial capital costs.

> "Treatment Value for Money" will be a theme first put into action at the Project Planning Workshop and instilled in each of our team members.

Value Engineering. "Treatment value for Money" will be a theme first put into action at the Project Planning Workshop and instilled in each of our team members. Furthermore, Treatment Value for Money will be institutionalized in an internal Value Engineering and Constructability (VEC) workshop conducted at the 30% design stage.

A capital cost estimate will be developed at the 30% design stage to support the VEC workshop, and overall City decision-making. The results of the internal VEC will identify possible capital costs savings, O&M costs reductions, and non-cost enhancements to the design.

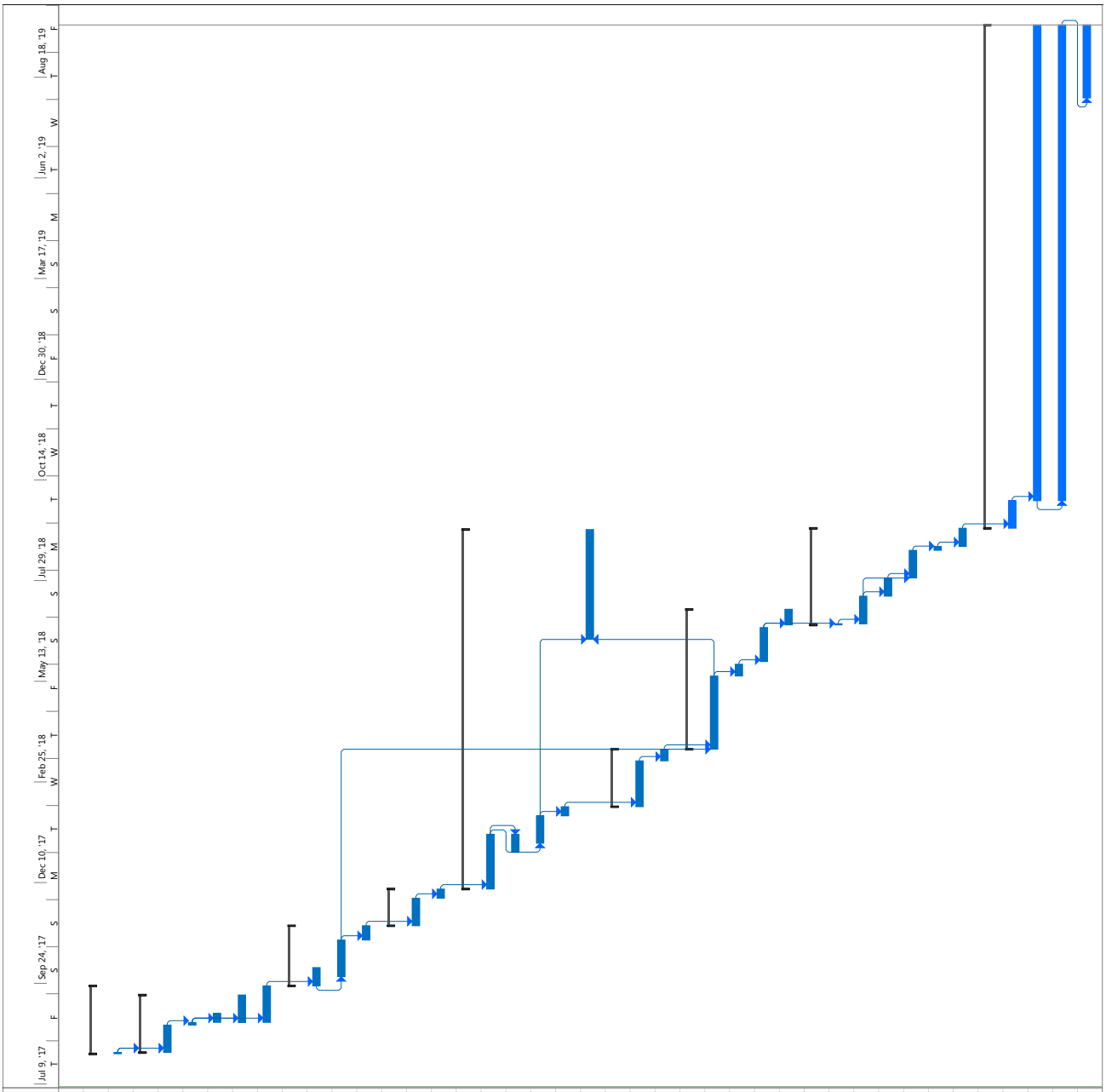
Process and discipline experts who are independent from the production of the design in the company will be key VEC participants. Also, the VEC process works best when the City contributes their treatment and O&M expertise, as well as, their decision-making input. If needed, adjustments to the design will be made as agreed upon with the City to reduce costs and/or increase value for money. The cost estimate at this stage is expected to provide a reasonable opinion of capital and O&M costs for City financial planning purposes.



Actual bid results from PBCWUD project **documents the effectiveness** of Carollo's cost estimating practices.

Figure 2. Preliminary Project Implementation Schedule.

WBS	Task Name	Duration	Start	Finish
1	**Project Planning**	**38 days**	**Tue 8/1/17**	**Thu 9/21/17**
1.1	Notice to Proceed	1 day	Tue 8/1/17	Tue 8/1/17
1.2	**Project Planning**	**32 days**	**Wed 8/2/17**	**Thu 9/14/17**
1.2.1	Project Workplan	15 days	Wed 8/2/17	Tue 8/22/17
1.2.2	Workshop	2 days	Wed 8/23/17	Thu 8/24/17
1.2.3	Risk Management Plan	5 days	Fri 8/25/17	Thu 8/31/17
1.2.4	Action Plan Development	15 days	Fri 8/25/17	Thu 9/14/17
1.3	**Project Management Plan**	20 days	Fri 8/25/17	Thu 9/21/17
2	**Design Criteria Confirmation**	**32 days**	**Fri 9/22/17**	**Mon 11/6/17**
2.1	WWTP Flows and Load TM	10 days	Fri 9/22/17	Thu 10/5/17
2.2	Plant-wide Capacity Study (optional)	20 days	Fri 9/29/17	Thu 10/26/17
2.3	Path Decision	7 days	Fri 10/27/17	Mon 11/6/17
3	**Conceptual Design**	**20 days**	**Tue 11/7/17**	**Mon 12/4/17**
3.1	Conceptual Design TM	15 days	Tue 11/7/17	Mon 11/27/17
3.2	City Review	5 days	Tue 11/28/17	Mon 12/4/17
4	**Preliminary Design (30%)**	**197 days**	**Tue 12/5/17**	**Wed 9/5/18**
4.1	Preliminary Design Submittal	30 days	Tue 12/5/17	Mon 1/15/18
4.2	MOPO plan	10 days	Tue 1/2/18	Mon 1/15/18
4.3	VEC Project Prep and Workshop	15 days	Tue 1/9/18	Mon 1/29/18
4.4	City Review	5 days	Tue 1/30/18	Mon 2/5/18
4.5	Permitting and Approvals	60 days	Thu 6/14/18	Wed 9/5/18
5	**Intermediate Design (60%)**	**32 days**	**Tue 2/6/18**	**Wed 3/21/18**
5.1	Intermediate Design Submittal	25 days	Tue 2/6/18	Mon 3/12/18
5.2	City Review	7 days	Tue 3/13/18	Wed 3/21/18
6	**Final Design**	**77 days**	**Thu 3/22/18**	**Fri 7/6/18**
6.1	Final Design Submittal (90%)	40 days	Thu 3/22/18	Wed 5/16/18
6.2	City Review	7 days	Thu 5/17/18	Fri 5/25/18
6.3	Final Design Submittal (100%)	20 days	Mon 5/28/18	Fri 6/22/18
6.4	Bid documents	10 days	Mon 6/25/18	Fri 7/6/18
7	**Biding Services**	**54 days**	**Mon 6/25/18**	**Thu 9/6/18**
7.1	Advertisement	1 day	Mon 6/25/18	Mon 6/25/18
7.2	Bid meeting	15 days	Tue 6/26/18	Mon 7/16/18
7.3	Questions response	10 days	Tue 7/17/18	Mon 7/30/18
7.4	Addendum preparation	15 days	Tue 7/31/18	Mon 8/20/18
7.5	Bid opening	3 days	Tue 8/21/18	Thu 8/23/18
7.6	Contract award recommendation	10 days	Fri 8/24/18	Thu 9/6/18
8	**Construction**	**275 days**	**Fri 9/7/18**	**Thu 9/26/19**
8.1	Management plan	15 days	Fri 9/7/18	Thu 9/27/18
8.2	Contact administration	260 days	Fri 9/28/18	Thu 9/26/19
8.3	Quality oversight	260 days	Fri 9/28/18	Thu 9/26/19
8.4	Startup	40 days	Fri 8/2/19	Thu 9/26/19



Carollo's approach to cost estimating involves using the project manager and engineers from the project team to develop the cost estimates. With this approach, Carollo's cost estimates are consistently in line with the expectations outlined by the AACE International, Inc. We update our cost databases with information from ENR magazine, the Handy Whitman Water Utilities Index, and RS Means. We also keep these databases updated with quotations for complex items, unusual materials, and large unique equipment.

A cost estimate will also be produced at the 90% level to provide the City with an opinion of cost prior to bidding.

6.a.5 Risk and Its Management

From the beginning of the project we will endeavor to look at the project through your eyes…understand risk from your perspective. Risk is defined by the *Oxford Dictionary* as "A situation involving exposure to danger, the possibility that something unpleasant or unwelcome will happen, and the possibility of financial loss." However, risk need not be feared, but proactively managed. A portion of the Project Planning Workshop will be dedicated to risk management and cover:

- Identifying and briefly describing risk elements
- Quantify potential damage to the City
- Assess the likelihood to occurrence
- Identified risk management approach - mitigate, transfer, avoid, accept
- Determine estimated residual risk exposure after risk management
- Assign action plans responsibility
- Continuously follow-up.

The result will be a risk register, another tool that our project manager will use to proactively guide and, as necessary, correct the course of the project. An example of the risk register format is presented in Figure 3 below.

As the project progresses through design and eventually into construction, the risk register and risk management actions will be updated on a regular basis to not only stay current, but always stay ahead of issues.

6.a.6 Resolving Conflict

The commitment of ever-present communications and jointly looking ahead to anticipate issues and resolve or avoid them early, will reduce the potential for conflict. The more the entire team and stakeholders engage, the lower the likelihood of conflict occurring, and if conflicts occur, quick resolution. Facilitating effective communication and

Risk Register - Template

Item	Risk Item	Description of Risk	Risk Level	Case Financial Impact (US$)	Action	Contingency	Residual Risk Level	Comments
1.0	Project Viability							
1.1								
1.2								
2.0	Safety							
2.1								
2.2								
3.0	Legal							
3.1								
3.2								
4.0	Financial							
4.1								
4.2								
5.0	Techncial							
5.1								
5.2								
6.0	Procurement							
6.1								
6.2								
7.0	Construction							
7.1								
7.2								
8.0	Schedule							
8.1								
8.2								
9.0	Operation and Maintenance							
9.1								
9.2								

Identified risks will be grouped according to:

- Project Viability
- Safety
- Legal
- Financial
- Technical
- Procurement
- Construction
- Schedule
- Operation and Maintenance

Figure 3. Risk Register Template with Risk Element Groups Relevant to the East WWTP Project.

engagement is respect for each person involved in this project. It is the foundation of how we work as Carollo and how we will lead this project. Randy Braley is committed to building the environment of individual respect and communication focused engagement.

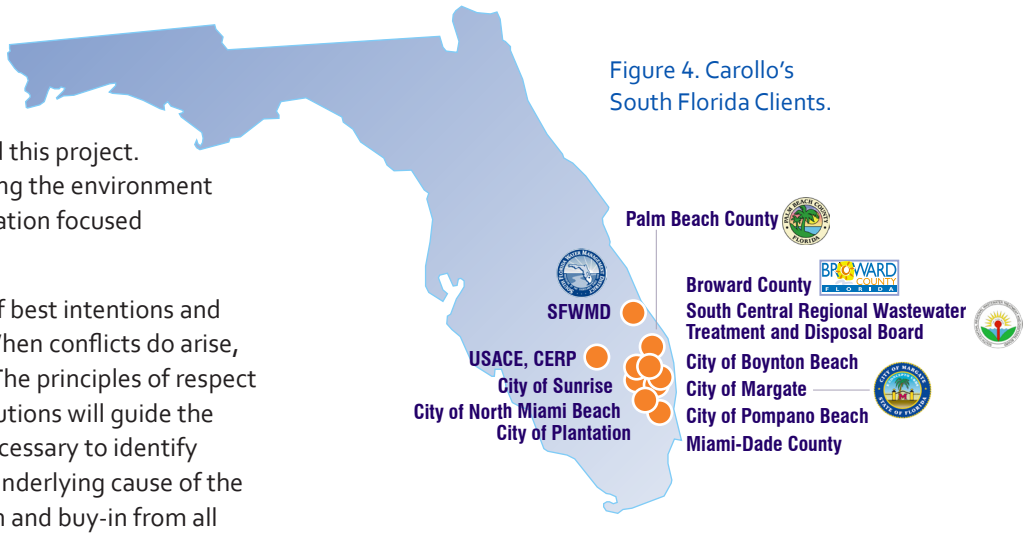


Figure 4. Carollo's South Florida Clients.

Sometimes stuff happens, in spite of best intentions and implementation of best practices. When conflicts do arise, seeking win-win results is our goal. The principles of respect for each individual and their contributions will guide the direct and open communications necessary to identify conflicts, listening and seeking the underlying cause of the conflict, and then formulating action and buy-in from all parties. If a durable win-win result is not readily apparent, then our project manager will receive appropriate support by Carollo executives or third party facilitators to achieve the best result possible for all parties.

Construction with a new third contractual party, the construction contractor, adds another dimension to conflict resolution. Four common sources of conflict during construction and our approach to managing these specific types of conflict are presented in Table 1 below.

6.a.7 Stakeholder Coordination and Permitting

A characteristic of successful work with governmental agencies is (1) understanding all the stakeholders and the most basic interests in the project, and then establishing the appropriate communication link. These two factors will be featured in the Communication Plan described in the section entitled "Ever-present and Open Communications."

Preserving and enhancing relationships are necessary for the success of this project, and for the City to maintain fruitful and mutually beneficial relationships with other stakeholders for years to come. The Communications Plan developed with the City will identify connection and coordination possibilities with stakeholders such as other municipal agencies, county authorities, regional authorities, utilities, state agencies, various public entities, and customer. Carollo's success enabling our governmental clients to preserve and enhance their long-term relationships is demonstrated by the deep loyalty of the long-term clients shown Figure 4 above.

Table 1. Carollo's Approach to Resolving Construction Conflicts.

Sources of Conflict	Relative Project Experience
Competing Priorities	The contractor will have to manage multiple subcontractors and their schedules. Depending on their availability, work may shift. We will attend conference calls or site meetings with the subcontractors and the contractor at least three weeks before they are scheduled to be on site. This helps all parties become aware of their responsibilities. We will also encourage regular construction progress meetings.
Schedule Delays	During the constructability review or before starting construction, we will identify equipment delivery with the greatest potential for delaying the work. We will establish internal milestones for submittal review and approval. Carollo will inquire about necessary submittal priorities and will complete those reviews first. If required, we will propose a "submittal meeting" for rapid resolution to keep the Project moving. Although these items are the contractor's responsibility, if one of them falls through the cracks, the overall Project may experience negative repercussions.
Lack of Resources	At times, contractors may try to eliminate or reduce site supervision and depend on City and Carollo inspectors to call out their errors. While we cannot force a contractor to increase its workforce, we will hold tailgate meetings with the field supervisors to ensure that each crew knows its plan and what needs to be accomplished to keep the project on track.
Personalities	No one person or party is responsible for the entire project. We are all "equity" owners in the work. As such, we will concentrate on working together to build it right the first time.

Permits and Approvals. Given that this project will take place primarily within the bounds of the East WWTP on city-owned land, the necessary stakeholder coordination will be relatively small. These are primarily represented by the following anticipated permits and approvals:

Florida Department of Environmental Protection: Wastewater Permit Application Form 2A for Domestic Wastewater Facilities [DEP Form **62-620.910(2)] for** increasing the permitted capacity of a municipal wastewater treatment facility.

South Florida Water Management District: Permit or approval requirements are not anticipated.

City of Margate: Building Permit for new construction within the City of Margate.

Broward County: No permits or approvals are anticipated.

Carollo will proactively coordinate with permitting and approval agencies and facilitate early issuance of permits and approvals, all while remembering that we represent the City in these relationships.

Project Management Approach Organization

Best Technology for the Margate East Plant - Inputs to Path 2

6.a.8 Technical Leadership Delivers New Capacity

The Path Forward. The City recognizes the potential of the East WWTP to take a bigger role in plant-wide wastewater treatment. It is our job at Carollo to lead the effort that fulfills the East's potential to greatly advance the overall reliability and cost-effectiveness of the City's system. If the City is ready, we will help you step forward, or possibly leap forward to maximize Treatment Value for Money.

As discussed previously, we are offering the City two possible paths forward to substantially boost treatment capacity at the East WWTP.

The City recognizes the potential of the East WWTP to take a bigger role in plant-wide wastewater treatment. It is our job at Carollo to lead the effort that fulfills the East WWTP's potential to greatly advance the overall reliability and cost-effectiveness of the City's system.

Path 1: Move forward with IFAS implementation to increase capacity at the East WWTP from 2.2 mgd to 4.0 mgd.

Path 2: Conduct an assessment of other technologies and possibly use another technology to maximize the capacity of the East WWTP beyond 4.0 mgd, and look at the City's East and West facilities comprehensively.

Path 1 allows Carollo to step directly into design based on our knowledge of the facility. For path 2 the project start would be similar, but an early task would be a concise plant-wide capacity study bringing into play advances in technology to 'leap" into a future with "no-worry reliability" and a much stronger, flexible future for plant-wide wastewater treatment.

As noted above, an early decision for the City, with Carollo input, is to select the design path for the East WWTP - Path 1 or Path 2. An alternative technology summary located at the end of this Project Management section titled "Best Technology for the Margate East Plant - Inputs to Path 2" evaluation was prepared as input to the City's early decision.

Project Understanding. Carollo has worked with Margate since 2014 to review and evaluate alternative technologies that could be used to increase the capacity of the East WWTP so that loads to the RBCs can be reduced. We've held a workshop with City staff on alternative treatment technologies, together visited the Cocoa Beach WRF that uses an IFAS process, evaluated the condition of the East WWTP, and estimated the cost to retrofit the East WWTP with an IFAS process and the potential capacity increase from doing so. A summary of the existing secondary treatment system is presented in Table 2 on the next page.

Table 2. Existing East WWTP Secondary System Sizing.

Treatment Process	Criteria	Description
Aeration Basins	Number - ft Length - ft Width - ft Side water depth - ft Volume - gal., each	2 92 46 13 411,520
Air Supply	Type Number Motor power - hp, each	Mechanical surface aerators 4 25
Secondary Clarification	Number Type Sludge withdrawal Diameter - ft Side water depth - ft Surface area - ft2	1 Center feed, peripheral weir Draft tube 80 12 125,027

Rod Reardon, our lead process specialist, Eric Stone, project engineer; Mario Gamboa, the lead I&C and electrical engineer; and Liz Fujikawa, Client Service Manager, all held key roles on the 2015 and 2016 East WWTP capacity studies, and return to bring their deep Margate knowledge to this project. Their knowledge and commitment to Margate will build momentum on the project immediately and ultimately delivering more treated wastewater faster.

Carollo knows your facility and understands your objectives for this project. Our understanding is that you wish to achieve an economical increase in the East WWTP using a simple, proven process that can be easily retrofitted into the existing plant.

Our previous work evaluated the IFAS system under a given set of assumptions regarding influent quality, effluent criteria, biological reaction rates, settling characteristics, redundancy, and structural condition. Each of these can affect the relative capacity that can be achieved in the East WWTP and the cost to implement each technology. For example, our original evaluations were based on the assumption that the upgraded East WWTP should meet an effluent total nitrogen goal of 10 mg/L to enhance the potential for reuse in the future. Designing for a total nitrogen goal has capacity and cost implications. Under severe budget constraints, the cost of the upgrade could be reduced some by designing for the existing secondary limits required for deep well disposal, rather than for future nitrogen removal.

Path 1 - IFAS System

Innovative processes such as IFAS have objectives to:

- Reduce the cost of treatment
- Reduce the process footprint
- Improve performance per given aeration system volume by elevating the concentration of the mixed liquor suspended solids, or the oxygen transfer efficiency, in a way that is not possible with conventional secondary treatment and basic biological nutrient removal (BNR) designs.

Path 1 provides the most direct means to provide this these objectives and proceed directly to design given Carollo's deep knowledge of the East WWTP. That knowledge will enable a quick review of our base assumptions during the 2016 IFAS study. Similarly raw wastewater quality often changes with time. With several more recent years of data available, the design influent wastewater quality will be quickly updated to establish detailed design influent criteria.

Retrofitting IFAS technology into the East WWTP will be set by the size and configuration of the existing facilities. We have learned that some of the special characteristics of the East WWTP relative to retrofitting new technology include the following:

- **Need to continue to produce Class B biosolids.** Our process simulations show that there is sufficient collective capacity between the aerobic digesters at the East WWTP and West WWTP. How the two plants can best work together will be determined.
- **The new process must fit within the existing hydraulic profile.** Our hydraulic calculations have shown that adequate capacity exists to transmit both treated effluent and WAS to the West WWTP with the projected 4.0 mgd increase in the capacity of the East WWTP.
- **Redundancy in the East WWTP.** Secondary treatment redundancy is contingent upon current and future sufficient capacity remaining in the RBCs to accept all the flow should the East WWTP need to come out of service for repair or routine maintenance. Given the new prominence of the East WWTP in the plant-wide wastewater approach, redundancy at this plant should be reevaluated for all unit process and major equipment.
- **Minimal flow peak factor.** Since the flow to the East WWTP is controlled by a valve on the pipeline from the transmission main under NW 66th Avenue, there is

expected minimal variation in flow to the East WWTP. Given the new prominence of the East WWTP in the plant-wide wastewater treatment, system flow split approaches should be reevaluated.

Implementation of the IFAS system for Path 1 will involve:

- New influent screens with smaller openings to improve screening.
- New aeration system including diffusers and three blowers (Two duty and one standby) with variable frequency drives (VFDs) and noise containment enclosures. The existing surface aerators would be removed.
- Instrumentation and controls system for the new blowers based on reliable dissolved oxygen (DO) probes.
- Electric power supply for the blowers including a new panel board.
- Aeration basin upgrades associated with the IFAS system needs, removal of the existing surface aerators, and any other needed improvements.

The blowers and diffusers for the IFAS system will be suitable for the hot, humid southeast Florida environment. Selection of blowers and the controls systems will consider:

Blower Type and Tradeoffs. The blower choices factor in the full range of design conditions: positive displacement blowers (low initial cost, smaller systems, low efficiency), multistage centrifugal blowers (low initial cost, low efficiency), high-speed turbo blowers (small footprint, energy efficient), integral gear, single-stage blowers (wide range of turndown, energy efficient).

Blowers Control. Selection of the blower type, size, and number such that: 1) optimal control is possible over a wide range of conditions where oxygen supply mirrors the oxygen demand (See Figure 5), and 2) blowers operate at near maximum efficiency at average conditions

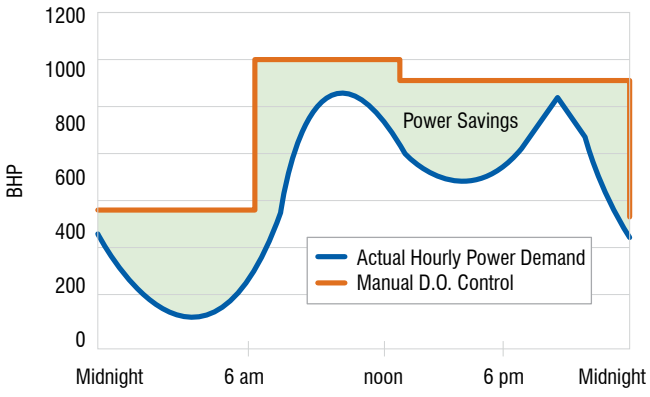


Figure 5. We will Maximize Aeration Power Savings with Real-time Controls.

Blower Drives. Motor and drive efficiency can drop significantly at low speeds; therefore, design the system so that blowers are operating at optimum speed and efficiency.

Path 2 - IFAS System

Implementing IFAS technology under this Project will increase the East WWTP capacity to over 40% of the total plant-wide capacity. That percentage is expected to grow over time due to the loss of RBC treatment capacity at the West WWTP. Additionally, new technologies are demonstrating positive full-scale results to cost-effectively increase conventional and nitrogen removal capacity at treatment plants. For these reasons, revisiting the approach to increasing capacity at the East WWTP may be warranted.

Reliability and Flexibility. The East WWTP is now indispensable to plant-wide treatment, thus enhancing facility reliability is prudent. Screening, secondary clarification, and pumps are priority concerns. While the IFAS system can be adapted to provide nitrogen removal, other technologies may provide greater flexibility and lower costs to adapt to changing wastewater treatment conditions and regulatory requirements. As part of a recommended comprehensive plant-wide capacity study, we are prepared to look afresh at each East WWTP unit process and piece of equipment for redundancy and long-term performance capability. If financing constraints exist, then improvements may require a phased approach.

Treat as Much Possible. As the West WWTP loses capacity by RBC attrition, each gallon of East WWTP liquid treatment capacity found becomes more important to the plant-wide treatment effort. To take a leap forward beyond 4.0 mgd of East capacity, other technologies should be considered in addition to IFAS. The "Best Technology for the Margate East Plant - Inputs to Path 2" evaluation presented at the end of this Project Management section offers viable options that have the potential to maximize Treatment Value for Money. This evaluation would be developed in more detail in the recommended comprehensive plant-wide capacity study,

Furthermore, if greater flow is treated at the East WWTP, then more aerobic digester capacity at the East facility would be needed or more excess digester capacity at the West WWTP would need to be utilized. A variety of sludge stabilization configurations can address the problem including operating the East and West aerobic digesters in series. In this scenario, the East WWTP would serve as a first stage aerobic digester with sludge flow then sent to the West for second stage digestion.

A City decision on the "path" to follow can be made during the award of the contract process, or as late as the planning phase of the Project following completion of the plant-wide capacity study.

Aeration Design Features. In addition to the secondary treatment technologies covered in the "Best Technology for the Margate East Plant - Inputs to Path 2" evaluation, Path 2 will pay the same attention to blower selection and control. If Path 2 is followed, even more aeration advances are available to the City to increase capacity, efficiency, and reliability. We refer to these advances as 4G aeration systems such as high density diffuser placement (See Figure 6 below), and nanobubble technology.

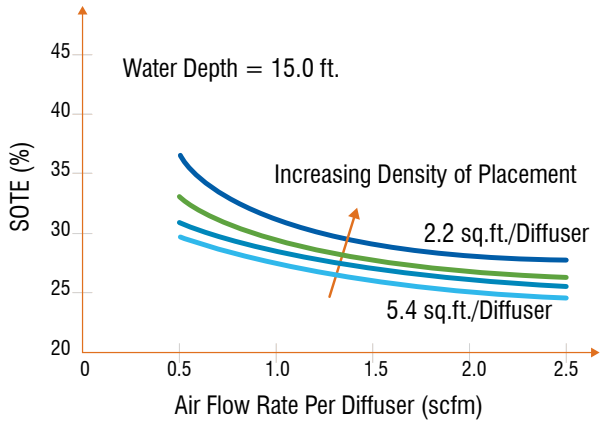


Figure 6. Oxygen Transfer Rate Increases with Density of Diffusers.

6.a.9 Quality… Integral to Our Business and Your Project

Our Quality Management Program is based on achieving or exceeding compliance standards by monitoring and improving quality and consists of:

- **Project Planning Workshop.** This meeting will be held at the beginning of the project to establish peer review schedule assignments, and basic design criteria.
- **Technical Review Committee (TRC).** Our TRC will provide independent and experienced engineers checking and providing guidance at 30% and 60% design completion milestones.
- **Monthly Review Meetings.** Quality will be a standard agenda item for our monthly progress meetings. Key team members will coordinate to achieve consensus and understanding of the overall design, and on constructability and operability issues.
- **Peer Review/Check.** Independent internal peer discipline reviewers for 30%, 60%, 90%, and 100% plan and specification deliverables as well on as requested basis.

6.a.10 Construction Management Turns the Project into Reality

Project planning and design activities have set the stage for the ultimate goal of this Project, a quality operating East WWTP that reliably treats at least 4.0 mgd of wastewater for years to come…the City's vision fulfilled. Construction and facility start-up, the final step to achieving that vision, consists of the following activities:

- Procuring a quality responsive construction contractor.
- Facilitating a smooth transition from design to construction and from startup to continued operation.
- Effectively communicating - key to construction success.
- Managing submittals and site inspection to extend the quality control process from design into construction.
- Conducting site inspection supporting comprehensive project quality control.
- Managing the change order and claim process to help manage the City's financial risk.
- Monitoring and reporting on schedule adherence by the contractor.
- Monitoring site safety.
- Supporting startup and commissioning activities.
- Documenting construction through record drawings.

Procurement services. The Carollo is committed to providing high quality engineering services during the bidding process. The following services will be provided:

- Coordination with the City's purchasing department.
- Submittal of final bid documents.
- Review of the bid advertisement
- Attendance at the pre-bid meeting and site walkthrough.
- Preparation of responses to bidder questions.
- Preparation of addendum documents.
- Attendance at the bid opening meeting.
- Review bid packages and prepare a comparison of bids.
- Prepare a recommendation of award letter.
- Preparation of conformed contract documents.

Communication is Key. From project planning through construction proactive, effective communications are essential to every successful construction project. As part of the construction services team, Carollo's role is to

support open lines of communication between the City, the construction contractor, and other stakeholders. We believe that the simplest and easiest form of communication is to pick up the phone or meet with you in person. To move the project forward and resolve outstanding issues, Carollo will attend regular progress meetings to support the City.

A formal process for managing contractor-sourced communications during construction is the Request for Information (RFI) process. Effectively managing RFIs and providing prompt responses promotes positive working relationships with all parties and supports maintaining the construction schedule. We will discourage unnecessary RFIs as a routine task, returning them to the contractor referencing the appropriate specification section or drawing. We will also keep the lines of communication open to minimize time-consuming and unnecessary paperwork. When an RFI might affect ongoing or planned construction, our CM team will spearhead the RFI review process at the field level, with input from the City, to keep construction on schedule.

Submittal Management. The submittal review process is a key opportunity to ensure that a project component is carried out as required. As a result, the importance of a rigorous review process cannot be overemphasized. When a submittal is received, Carollo will review it for completeness and determine if the information is sufficient or the submittal has not been certified as conforming to the contract documents. If a submittal requires multiple revisions and is considered critical, we will resolve all comments immediately during a conference call or site meeting with the contractor to prevent delays.

Site Inspection. Carollo representatives will be on site to inspect the project at critical activities during installation, and steadily during startup and commission activities. Our construction manager, Terry Storck, has built an excellent career managing water facilities construction in southeastern Florida, and will work closely with the City's team assigned to construction management. A division of responsibility memorandum of understanding between the City and Carollo will clearly establish the site inspection responsibilities of Carollo and the City with a goal of providing comprehensive construction quality control, cost-effectively.

Change Orders Management. Where possible, changes that affect ongoing construction will be resolved at the field level. Changes from cost adjustments will be addressed as soon as possible to minimize additional cost and schedule impacts. Our proven procedures for resolving potential change orders and claims are as follows:

Replacement of surface aerators with IFAS technology will unlock East WWTP treatment potential.

- Assist the City identify each issue that may lead to a change order or claim.
- If the contractor chooses to submit an official change order request or notice of potential claim, review it and recommend ways to resolve the issue.

If a change order request or notice of potential claim is justified, support the City during negotiations with the contractor.

In Carollo's projects over the last 10 years, change orders have averaged **less than 2 percent of construction cost** (exclusive of owner-initiated scope additions). Claims have been approximately 100th of 1 percent, and **more than 98 percent are claim-free**.

Schedule Monitoring and Support. Our construction support team will help the City manage the overall schedule. As the most important tool for monitoring work, the contractor's initial construction schedule will be used to prevent delays, design "work-around" solutions when problems arise, and determine progress payments to the contractor. The schedule, as originally approved, becomes a legal document for analyzing extensions of time, delays, and delay claims. We have tools at our disposal to analyze the schedule and identify errors in logic and activities that appear incorrect.

Safety Focus. In any engineering and construction project, safety is paramount. A safe working environment protects all parties working whether in the office or on site. No matter the location, our team will comply with our safety plan (See Figure 7 on the next page), and as applicable, the contractor's safety plan as established and approved by the contractor's safety officer. If we observe unsafe conditions, we will report them to the City. Carollo's emphasis on design and safety consistently leads to a safer project environment.

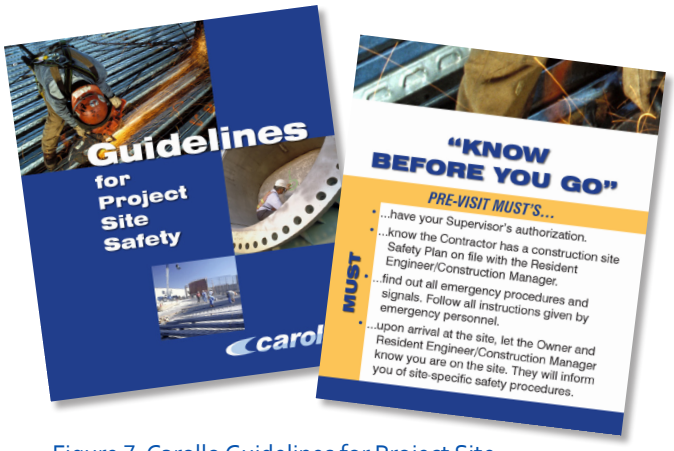


Figure 7. Carollo Guidelines for Project Site Safety, Makes Clear Expectations on the Job Site.

Startup and Commissioning. All construction activities must lead to successful commissioning and plant startup. Often, these are not "flawless" and require a "break-in" period. We will work closely with the City, the contractor, and major equipment suppliers to minimize these challenges. Having an experienced project team that knows the treatment process will lead to a superior plant and smoother startup and commissioning. The submittal process, factory acceptance testing, and operator training are just a few examples of how our team will support the City's focus on construction activities. By paying attention to detail at the beginning of the project, we can provide significant benefits during later stages.

Record Documents. We will focus on the contractor fulfilling its responsibility to maintain and provide to the City accurate and complete construction records. Our team will request and verify "redline" markups of the contract drawings and specifications that show information on underground utilities and all approved contract modifications through change orders and RFIs. We will help the City monitor the contractor's record documents monthly to ensure completeness and accuracy. At the 50%, 75%, and 90% completion levels, we will review the contractor's working record documents and advise on document acceptability.

We recommend making all progress payments contingent on the continual maintenance, upkeep, and acceptability of the working record documents. When the project ends, we will reconcile our comments on the markups with the contractor's and prepare the final record drawings as both a hardcopy and electronic copy.

Project Management Approach Organization

Best Technology for the Margate East Plant - Inputs to Path 2

6.b SPECIFIC EXPERTISE AND EXPERIENCE

6.b.1 Working Wonders with Water

During our 84-year history, Carollo has successfully completed more than 20,000 projects. Unlike the majority of our competitors, we only provide water and wastewater services. Our wastewater treatment experience includes more than 200 plants ranging in size from less than 1 mgd to more than 600 mgd. We routinely complete services for new construction, expansions, rehabilitation, and other improvements or modifications, all relevant to the East WWTP.

Water is our focus, our business, and our passion, allowing us to put all our resources and energy into "Working Wonders with Water." Carollo is known in the industry for our innovative solutions. We have established ourselves as pioneers in the latest in aeration system technologies, procurement, secondary treatment systems, and design by maintaining a knowledge base of system design, modeling tools, and installation. What does all this mean to the City? Simply this: The most cost-effective capacity upgrade for the East WWTP.

6.b.2 Experience and Expertise Applicable to the Margate East WWTP Upgrade

The City plans to increase treatment capacity at the East WWTP from 2.2 mgd to a desired 4.0 mgd. The key component is greatly enhancing the effectiveness of the existing aeration basins and secondary treatment capacity.

Section 6.b demonstrates Carollo's extraordinary project work upgrading aeration system efficiency and increasing secondary treatment capacity. We have presented numerous Carollo planning, design and construction projects from Florida and across the country that are directly applicable to the needs of the City. These projects demonstrate Carollo's deep experience and leading edge expertise in capacity expansion, aeration efficiency, and reliability critical to expansion of system of the East WWTP.

Specific projects are described in detail in Section F of the SF 300 included in the Proposal.

Aeration System Design Expertise. Carollo offers you extraordinary qualifications in the evaluation and design of aeration blowers and associated electrical and instrumentation modifications. Our evaluation experience includes analysis of process and aeration air needs to accurately determine the optimum range of air requirements. We have extensive experience in conducting detailed analysis of available blower technologies, including high-speed turbo blower systems. In fact, in 2003 Carollo was the first engineering firm in the U.S. to pilot test the use of a Neuros turbo blower at the Eastern Municipal Water District's Moreno Valley WWTP. Since then, we have worked closely with major turbo blower manufacturers (Neuros, K-Turbo, HSI, Inovair, Turblex, ABS/HST, and Atlas Copco) to evaluate the quality and performance of their equipment, as well as, their long-term capability to perform and support projects in the U.S.

Our design experience includes both new and replacement blower designs for many clients. We recognize the unique challenges associated with replacement designs, and pay special attention when laying out new blowers inside an existing spaces, tying in blower piping, modifying existing structures to suit the new blowers, and integrating electrical and control systems to the existing SCADA system, in order to provide a seamless transition from design to startup. A select listing of our vast aeration upgrade and capacity increase experience is presented in Table 3 below.

Table 3. Representative Carollo Aeration Capacity Increase and Upgrade Experience

Facility	Capacity (mgd)	Relevance to Margate	Completion Date
Wesley Center Wastewater Treatment Facility (Pasco County) - Wesley Chapel, FL	9.0	Capacity Expansion; Upgrade to Fine Bubble Diffusers; New Positive Displacement Blowers; New Aeration Control	2017
Central County Water Reclamation Facility - Sarasota, FL	8.0	Capacity Expansion; Upgrade to Fine Bubble Diffusers; New Multi-Stage Centrifugal Blowers	2008, 2017
Lake Bradford Road Wastewater Treatment Facility - Tallahassee, FL	4.5	MBR Conversion; Upgrade to Fine Bubble Diffusers; New Positive Displacement Blowers	2009
Northeast Water Reclamation Facility - Collier, FL	4.0	New MLE Facility; Fine Bubble Diffusers; Multi-Stage Centrifugal Blowers	Design Complete 2010
Blacks Ford Water Reclamation Facility - Jacksonville, FL	4.0	OTE Testing; CFD Modeling; Process Simulation	2012
Blacks Ford Water Reclamation Facility - Jacksonville, FL	4.0	Reliability Study - AWT SBR with jet aeration and mixing; multistage centrifugal blowers	2011
Babcock Ranch Community Utility Site - Charlotte County, FL	0.75	Upgrade to BioMag Ballasted Activated Sludge; Upgrade to Fine Bubble Diffusers	Design Complete 2017
West Regional Water Reclamation Facility - Daytona Beach, FL	15.0	Aeration Process Improvement; Condition Assessment	2012
West Regional Water Reclamation Facility - Daytona Beach, FL	15.0	Upgrade to Fine Bubble Diffusers; Automated DO Control	2017
City of Mesa Greenfield Water Reclamation Plant - Gilbert, AZ	30.0	Upgrade to Fine Bubble Diffusers; Capacity Expansion; New High-Speed Turbo Blowers	2020
Figueroa Avenue Water Pollution Control Facility - Yuma, AZ	12.0	Upgrade to Fine Bubble Diffusers; Piping Addition; Blower Addition	2008
City of Chandler Ocotillo Water Reclamation Facility - Chandler, AZ	5.0	Upgrade to Fine Bubble Diffusers; Capacity Expansion; New Single-Stage Centrifugal Blowers	2017

Table 3. Representative Carollo Aeration Capacity Increase and Upgrade Experience (Continued)

Facility	Capacity (mgd)	Relevance to Margate	Completion Date
San Jose-Santa Clara Regional Wastewater Facility - San Jose, CA	167.0	Diffuser Replacement; Blower Upgrade	2015
Encina Water Pollution Control Facility - Encina, CA	40.5	Addition of Anaerobic Selector; Upgrade to Fine Bubble Diffusers	2015
Central Marin Sanitation Agency WWTP - San Rafael, CA	30.0	Diffuser Replacement	2011
Turlock Regional Water Quality Control Facility - Turlock, CA	15.0	Upgrade to Fine Bubble Diffusers	2019
South San Francisco/San Bruno Water Quality Control Plant - South San Francisco, CA	13.0	Process Improvement; Fine Bubble Diffuser Replacement; Addition of Anaerobic Selectors	Design Complete 2012
Monterey Regional Water Pollution Control Agency Regional Treatment Plant - Marina, CA	30.0	Diffuser Replacement; New High-Speed Turbo Blowers	2013
City of Richmond WWTP, CA	15.2	Upgrade to Fine Bubble Diffusers; New High-Speed Turbo Blowers	Design Complete 2016
Coffee Creek Water Resource Recovery Facility - Edmond, OK	12.0	Capacity Expansion; Upgrade to BNR; Upgrade to Fine Bubble Diffusers; New High-Speed Turbo Blowers	2020
South Austin Regional Wastewater Treatment Plant - De Valle, TX	75.0	Blower Replacement (Single Stage Centrifugal); Diffuser Replacement	On-going
Stewart Creek West Wastewater Treatment Plant (NTMWD) - Frisco, TX	10.0	Capacity Expansion; Fine Bubble Diffusers; New High-Speed Turbo Blowers	2016
South Wastewater Treatment Plant - McAllen, TX	10.0	New Fine Bubble Diffusers; New High-Speed Turbo Blowers	2014
City of Manhattan Wastewater Treatment Plant - Manhattan, KS	8.8	Upgrade to BNR; New Fine Bubble Diffusers; New Automated DO Control	2013
Provo City Water Reclamation Plant - Provo, UT	21.0	Upgrade to Fine Bubble Diffusers	1994
Wentzville Water Reclamation Center - Wentzville, MO	5.1	Capacity Expansion; Fine Bubble Diffusers;	2007, 2012

Maximize Energy Savings and Operability Through Blower Sizing and Selection and Diffuser Selection. Typical to the industry, aeration systems are oversized and inefficient, running at the wrong point on the system curve and wasting energy, or worse, inoperable due to blower surge. Our evaluations will define and blend air production needs and transfer efficiencies to accurately determine the optimum range, volume, and timing of air requirements. This accurate sizing and selection of blowers is critical to maximizing energy savings and improving operability. Selection the most appropriate and cost-effective diffuser is also critical to transferring oxygen to secondary treatment microorganisms. Our team's years of experience in correctly size blowers and applying cost-effective diffusers will be applied to minimize O&M costs at the East WWTP. Three examples of capacity increases and energy savings projects have been taken from the Table 3 above are:

- **Pasco County Wesley Center WWTP Expansion.** Carollo is currently designing an expansion of the Wesley Center WWTP from 6 to 9 mgd. The project will continue to use an MLE process to meet an effluent limit of 10 mg/L total nitrogen. An integral part of the project is the replacement of the existing mechanical surface aerators with a diffused aeration system with rotary lobe blowers and fine pore, EPDM membrane disc diffusers.
- **Daytona Beach West Regional Water Reclamation Facility Improvements.** Daytona Beach tasked Carollo with an assessment of the West Regional WRF facility condition. One of the problems being experienced by the West Regional WRF is the inability to supply sufficient oxygen during peak loads. Our assessment included field, dirty water testing of the

mechanical surface aerators to quantify their capacity, and economic comparison of multiple alternatives for increasing aeration system capacity. Carollo is currently working with the City to implement the facility improvements.

- **Sarasota County Central WWTP Expansion.** Sarasota County needed to increase the capacity of its Central County Water Reclamation Facility (CCWRF) due to flow increases from the consolidation of developer operated utilities and a septic tank replacement program. CCWRF was originally rated at 4 mgd on a maximum month average daily flow (MMADF) basis. Carollo performed a preliminary design study, including identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required to convert the biological treatment process to an MLE process in phased expansions of 5.4 and 8.0 mgd MMADF. During the first phase, the rotor aerators were removed from the oxidation ditches and replaced with fine bubble diffusers, and multi-stage centrifugal blowers were installed to provide process air. Sensors were installed in the ditches to monitor dissolved oxygen levels, and the process logic used the number of blowers on-line and the blower inlet valve position to maintain the desired dissolved oxygen levels. The expansion to 5.4 mgd was completed in 2008, and the expansion to 8.0 mgd is currently under construction and scheduled for completion in November 2017.

Aeration System Creativity Yields Mountain-sized Capacity Improvements and Costs Savings. Carollo's design and construction management for $180M of improvements to the Denver, Colorado, Metropolitan Wastewater Reclamation District's Robert W. Hite Treatment Facility creatively increased capacity and generated millions of dollars of savings. These results led to Carollo's work to be recognized as the best environmental design project for 2017 as the winner of the Grand Prize for Design by the American Academy of Environmental Engineers and Scientists.

You will receive the same creative and client-focused engineering. In fact, the engineer-in-charge for the Hite Facility, John Fraser, is also assigned to this project in a process and quality management role. A few features of our work on the Hite Facility are:

South Secondary Treatment Complex:

- Design and construction management for this 114-mgd facility.
- Five high efficiency, single-stage centrifugal blowers
- More than $1M of savings through an imaginative new blower configuration
- Working with the regulators to receive approval of the facility designs.
- CFD modeling and improvements to 10 existing secondary clarifiers to increase capacity.

North Secondary Treatment Complex:

- Reduced the project cost by $17M by incorporating side-stream centrate treatment basins and eliminating the need for new aeration basins and secondary clarifiers.
- Capacity was increased from 86 mgd to 106 mgd through an innovative treatment process.
- The existing 12 aeration basins were modified to improve treatment, enhance nitrogen removal, and provide future Bio P removal.
- The owner, Carollo, and the contractor worked as an integrated team to minimize disruptions to in-service operations and complete the project 12 months ahead of schedule in 2015.

"Carollo's ability to listen to and collaborate with the owner on innovative design solutions is unmatched by anyone in the industry. Their attention to detail and thorough design development translates into a quality work product in the field, one that the entire project team can be proud of."

— Sherman Papke, Lead Facility Construction Engineer, Metro Wastewater Reclamation District

6.b.3 Construction Management

Carollo truly is a leader in aeration engineering and design prowess; however, we are also leaders in the field of construction management for wastewater and water facilities. Carollo is ranked 33rd among ENR's Top 100 Construction Management (CM) firms, providing CM services exclusively for water and wastewater projects, including facilities designed by Carollo

The projects listed in Table 3 and in the SF 330 Form involve substantial construction management services. We represented client interests while their visions were fulfilled—treatment plants built and treated water delivered.

and others. In fact, nearly one-third of our annual total company revenues are for construction-related services.

Our team fully understands and is very familiar with Margate construction projects, as well as, wastewater and water facility construction in southeast Florida. Our local staff includes construction managers, resident engineers, and resident and specialty inspectors.

6.b.4 When Innovation Counts

As we described in Section 6.a, Project Management Approach, it may be beneficial for the City to look at means to maximize capacity and reliability of the East WWTP, in addition to the IFAS system. Carollo can support the City in such efforts through preparing the noted plant-wide capacity study. Making the plant-wide study effective is our deep knowledge of aeration system blowers, diffusers, and process; and diligent efforts to stay well ahead of the curve with 4G aeration technology (See Figure 8). We look forward to applying our deep experience and "ahead of the curve" knowledge and expertise to implementation of the IFAS system or other effective capacity increasing system for the City.

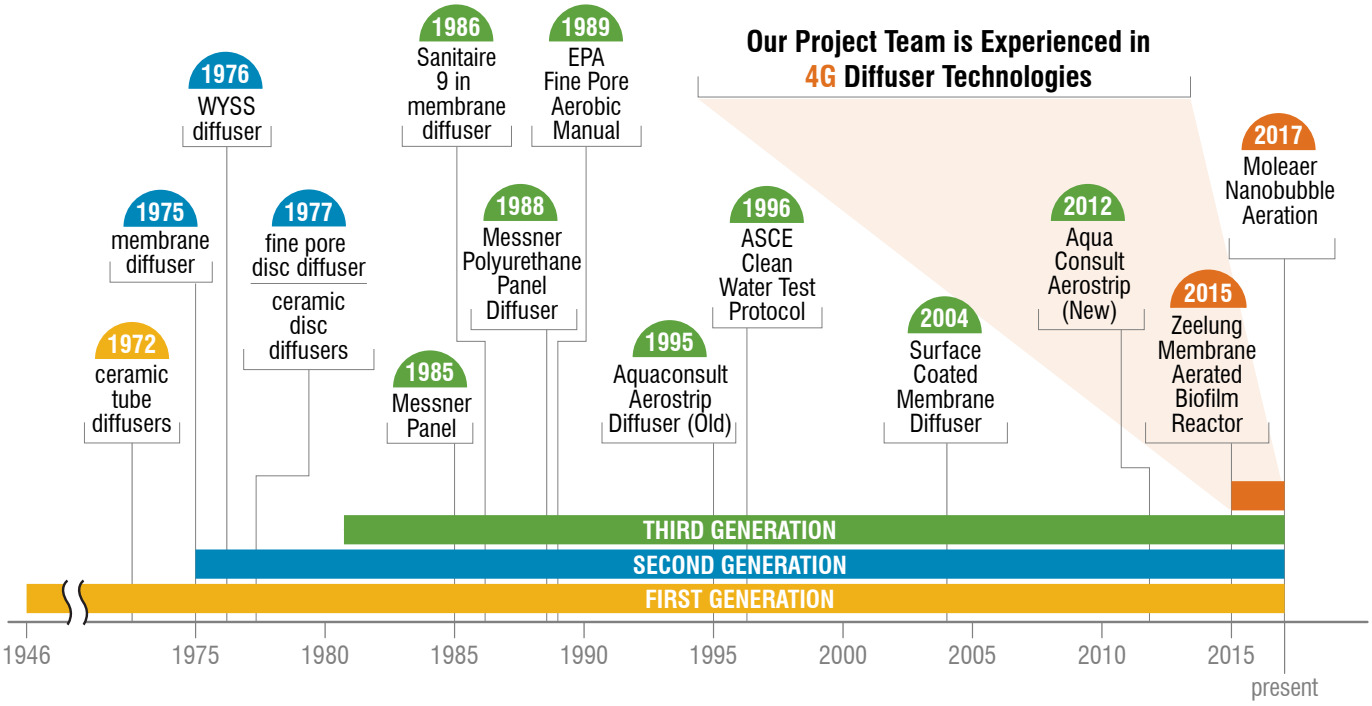


Figure 8. Carollo's Leadership in Diffuser Technology will Maximize Transfer Efficiency and Cost Savings.

BEST TECHNOLOGY FOR THE MARGATE EAST PLANT - Inputs to Path 2

While wastewater treatment technologies and performance continue to evolve, the overall goals remain similar: simplicity, ease of operation, a small footprint, and low cost of ownership. Innovative processes seek to reduce the cost of treatment, reduce the process footprint, or improve performance by elevating the concentration of the mixed liquor suspended solids (MLSS), or the oxygen transfer efficiency, in a way that is not possible with conventional BNR designs. Conventional activated sludge processes are ultimately limited by the performance of the final clarifiers. Most of the current innovative technologies attempt to overcome this limitation by using fixed-film processes, increasing sludge-settling velocity, or replacing clarifiers with membrane separation.

Three years have passed since this work was started, and the status of the various alternative treatment technologies has continued to advance, now would be a good time to validate the choice of technology prior to commencing final design. If the City wants to validate the technology selection, we think that this could be done very quickly given the work that we have already completed. A preliminary analysis of this type assuming that the East WWTP is upgraded to treat 4.0 is shown in Figure 9.

Based on our knowledge of current technologies and the East WWTP, we propose that the following treatment technologies could be re-assessed:

- Integrated Fixed-film Activated Sludge (IFAS)
- Moving Bed Biofilm Reactor (MBBR)
- Ballasted Activated Sludge (BioMag® or S-Select®)
- Mixed Liquor Vacuum Degassing (MLVD, Biogradex®)
- Membrane Bioreactor (MBR)
- Membrane Aerated Biofilm Reactor (MABR, ZeeLung®)
- Replacement of failed RBC shafts with new ones (baseline option)

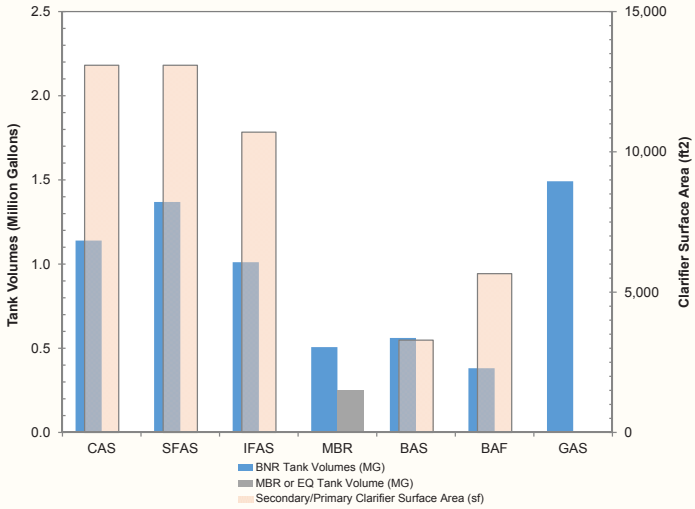


Figure 9. Technology Comparison Summary.

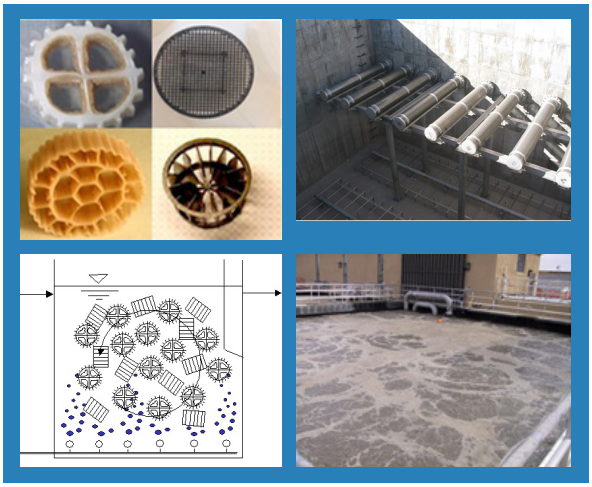


Figure 10. IFAS Media.

A brief description of each technology follows: **Integrated Fixed-film Activated Sludge (IFAS)** - The IFAS process provides an elevated biomass concentration through an entire zone of the process or the entire treatment volume by adding an attached growth media to the aeration tank. Examples of media are shown in Figure 10. The suspended MLSS concentrations are kept about the same as those found in conventional processes.

However, the biomass growing on the fixed media significantly increases the total biomass inventory compared to a conventional suspended growth process with the same volume. Thus, an IFAS aeration tank can handle a higher volumetric loading rate than a conventional one, while the solids loading rate to the clarifiers downstream stays the same.

The IFAS process was developed in Europe during the early 1980s, and became popular there at full scale in the early 1990s. The process gained popularity in the US during the late 1990s and continues to be a popular option, especially for capacity or nitrogen removal upgrades. In those upgrades, higher operation and maintenance costs are justified by the reduced construction costs when existing treatment basins are retrofitted and largely re-used. At least 210 IFAS plants worldwide have been documented; 99 of these are US installations, with the largest rated at 77 mgd.

Important considerations for the IFAS process are the higher energy required for aeration, extra maintenance costs associated with accessing diffusers below the media, the additional capital cost for screens to retain the media in the aeration tank, and the cost of the media. The IFAS system usually requires the use of proprietary media. Advantages and disadvantages exist for both fixed and mobile media. Key parameters are the surface area of a particular media per given volume (ft^2/ft^3) and the total bulk tank volume occupied by the media (percent fill).

Moving Bed Biofilm Reactor (MBBR) - While MBBR process are similar to IFAS processes in that they use aeration tanks that are one-third to two-thirds filled with plastic media, MBBR processes do not recycle biomass from the clarifier to the aeration tank (Figure 11). As a result MBBR processes are pure biofilm processes similar to the existing RBC plant. Unlike the RBC process, MBBRs use small plastic shapes with high surface area that are completely submerged and move freely in the aeration tank. The plastic media is the same as that used in IFAS processes Diffused aeration supplies air for the biomass. The suspended solids that slough from the media have similar characteristics to RBC solids. The aeration tank effluent suspended solids concentrations are an order of magnitude less than from activated sludge processes, and this enables the use of alternative solids separation methods like DAFs or disc filters. The reactor effluent solids often don't flocculate as well as the solids from suspended growth processes, and pin floc may be present. There are no RAS pumps with MBBRs, and also less operational controls.

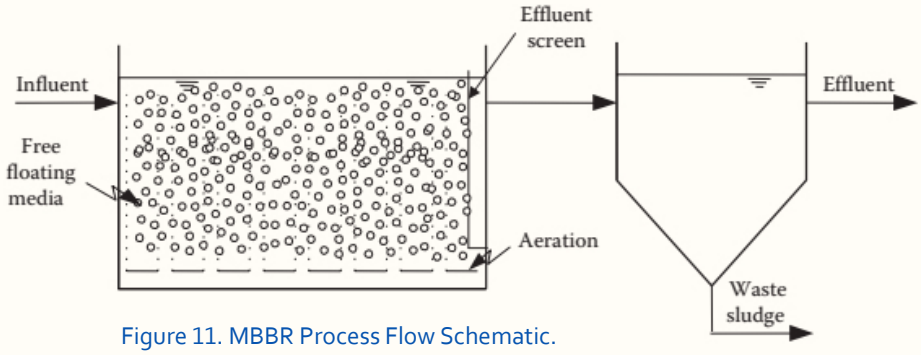


Figure 11. MBBR Process Flow Schematic.

Ballasted Activated Sludge (BioMag™; S-Select®) - Ballasted activated sludge (BAS) systems allow for a higher biomass concentration to be maintained in the aeration tank than a conventional suspended growth culture by physically improving settling velocities with a weighting or ballast material. The ballast material is magnetite, which is a naturally magnetic, plentiful, dense, and inert iron oxide. Large amounts of magnetite are used to manufacture steel, abrasives, and iron salts, and it is used in the mining industry to separate coal with low sulfur content. A typical Biomag flow schematic is depicted in Figure 12.

BAS is a relatively new process that has gained a foothold in the 1-10 mgd market quickly since the first installation in 2011. A total of eight full-scale plants operate now, with the largest installation at 21,600 m^3/d (5.7 mgd). Four others are in start-up, and another four are in construction.

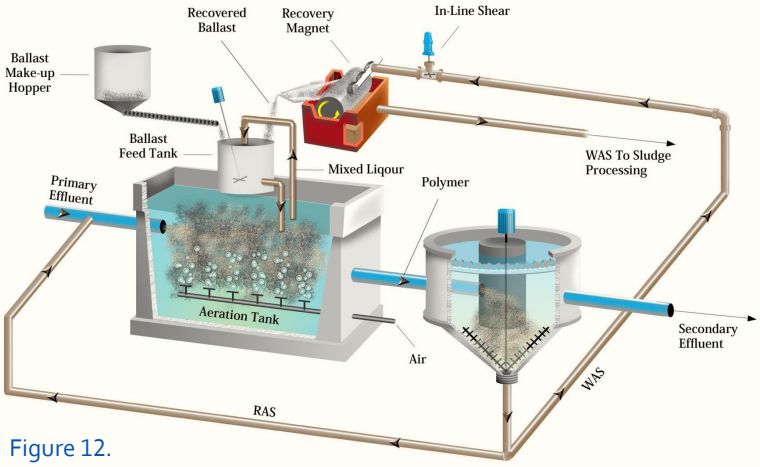


Figure 12.
Biomag Process Flow.

Like IFAS, BAS is especially well suited for retrofitting existing plants. However, unlike IFAS, no structural tank alterations are required. BAS does require covered floor-space to house the magnetite feeding and recovery equipment. Magnetite is recovered from waste activated sludge (WAS) using a shear mill and a magnetic recovery drum. An approximately 1: 1 mass ratio of magnetite to biomass is added to the mixed liquor, allowing for a mixed liquor volatile suspended solids (MLVSS) concentration of 5,000-6,000 g/L or a total suspended solids (TSS) concentration of 10,000-12,000 mg/L. Because the specific gravity of magnetite is high (about 5.2), it increases MLSS settling velocities significantly and is around 95 percent recoverable via its magnetic properties using recovery drums with permanent magnets.

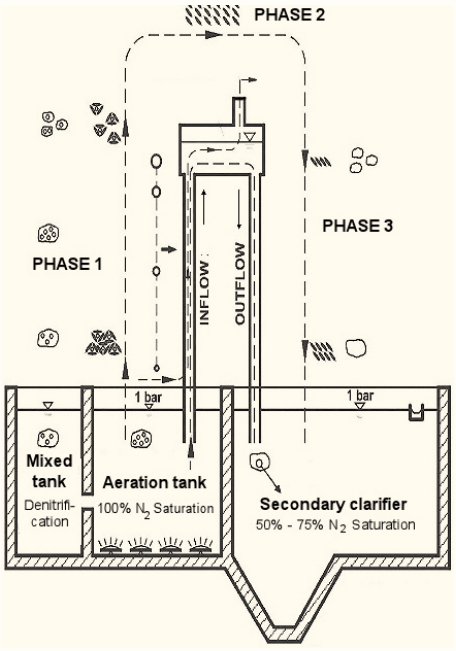


Figure 13. MLVD Cross Section.

Mixed Liquor Vacuum Degassing (Biogradex®) - In the mixed liquor vacuum degasification (MLVD) process, the aeration tank effluent is passed through a siphon tower that exposes the mixed liquor to vacuum conditions which strips dissolved gases, primarily nitrogen from the mixed liquor. As a result the degasified mixed liquor settles better than the mixed liquor from a conventional BNR process. Use of MLVD is limited to continuous flow BNR processes, and it can be combined with other suspended growth BNR processes like IFAS and BAS. By removing dissolved gases, it is claimed that the MLSS concentration can be increased by about 1.7 to 2.6 times - from 3,500-4,500 to 6,000-9,000 mg/L. At the same time, the solids loading rate to the clarifiers can be essentially doubled. The result is that treatment capacity can be increased proportionately assuming no other processes are limiting. The patent holder for the MLVD process claims that use of this technology can reduce overall plant area by 25-35 percent in comparison to conventional technologies, and reduce energy consumption by 20 percent. A typical section of the MLVD process is presented in Figure 13.

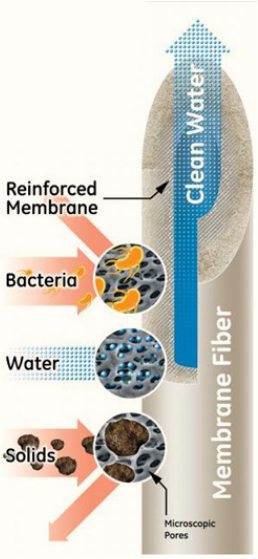


Figure 14. MBR Fiber Cross-section.

MLVD has been in full-scale use at municipal wastewater treatment plants for at least ten years, and is currently in use at about 37 facilities primarily in Poland. A full-scale demonstration of MLVD has recently started operation at the 36-mgd Bonny Brook wastewater treatment plant in Calgary Canada.

Membrane Bioreactors (MBRs) - MBRs can support high MLSS concentrations because they use semi-porous membranes to separate the aeration tank biomass from the treated effluent rather than gravity clarifiers as in a conventional activated sludge process. The membranes have pores that are typically in the microfiltration (0.2 microns) or the ultrafiltration (0.04 micron) range. Because MBRs do not require clarifiers or tertiary filters, and because they can operate at high MLSS concentrations, MBRs occupy a small footprint relative to their treatment capacity. In addition MBRs produce a high quality effluent that is essentially free of suspended solids and pathogens.

MBRs require energy to both drive the water through the membranes (10 to 20 feet of water) as well as for air scour to control fouling of the membranes. This energy requirement may be as much as double that of a comparably rated conventional process, although unit energy consumption is reported to have dropped as low as 0.20 kWh/m^3 in current designs. A drawing cross-section of an MBR fiber is presented in Figure 14.

Membrane Aerated Biofilm Reactor (MABR) - While at first glance, the configuration of a MABR cassette looks very similar to a membrane bioreactor (MBR) cassette, the two processes are very different. An image of GE's ZeeLung cassette is presented in Figure 15. In a MABR process air or oxygen is pumped into the lumen (hollow interior) of bundles of hollow fiber membranes. Oxygen then diffuses outward through the membrane to biofilms growing on the exterior of the membranes. MABR air flow and biofilm growth concepts are presented in Figure 16. As with IFAS, a MABR is a hybrid process that combines the use of suspended and attached biomass. The membranes are typically installed in unmixed zones at the head of an aeration tank where they provide simultaneous nitrification and denitrification for a fraction of the incoming nitrogen. The conventional aeration zone following the membrane zone removes the remainder of the carbon and ammonia.

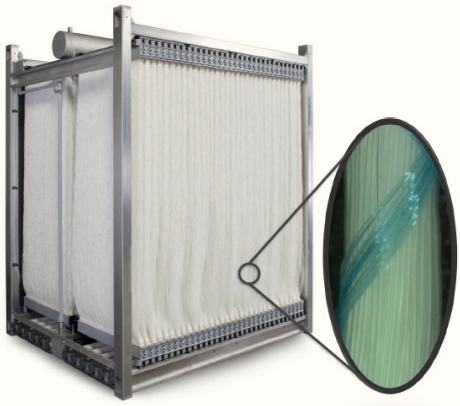


Figure 15. GE's ZeeLung Cassette.

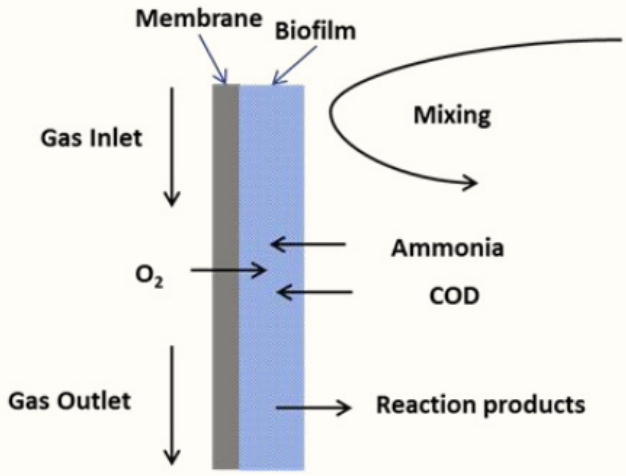


Figure 16. MABR Fiber Concept.

The benefits offered by a MABR are a higher biomass concentration and very efficient oxygen transfer. This could translate into a capacity increase of up to 50 percent with a concurrent reduction in energy use for aeration of about 40 percent. MABR is the newest of the technologies discussed above. At present there is only one small full-scale installation in operation in North America, and a second larger retrofit under construction at the Yorkville-Bristol WWTP in Illinois. The latter is scheduled to begin operation later this year.

Summary. Carollo has built-up a working knowledge of the Margate wastewater treatment facilities through our work as one of your continuing engineering consultants over the past few years. In addition, we have already worked closely with you to evaluate and select a technology for increasing the capacity of the East WWTP economically. As a national firm that specializes in water and wastewater engineering, we have both the national and local resources to support the City in moving this project forward expeditiously in the manner of your choosing. Table 4. presents a preliminary qualitative analysis of technologies that have promise to maximize secondary treatment capacity at the East WWTP.

Table 4. Margate East WWTP - Preliminary Qualitative Analysis of Capacity Increasing Technologies.

	Characteristic	SFAS	BAS	IFAS	MBBR	MBR	MLVD	MABR	AGS
Advantages	Increases Biomass Inventory	●	●	●	●	●	●	●	●
	Increases MLSS Settling Velocity		●		●	NA	●		●
	Increases O_2 Transfer Efficiency						?	●	?
	Works with Nitrogen Removal	●	●	●	●	●	●	●	●
	Does Not Require Clarifiers				(1)				●
	Lower Power Costs						?	●	●
	Higher Quality Effluent					● (2)			● (3)
	Low Hydraulic Head Loss	●	●	●	●			●	
	Continuous Flow Process	●	●	●	●	●	●	●	
Disadvantages	Decreased O_2 Transfer Efficiency			●	●				
	More Turbid Effluent / May Require Coagulant				●				
	More Mechanical Equipment		●			●	● (4)	● (5)	
	Limited Full-Scale Experience							●	●
	Higher Power Costs		●	●	●	●			
	Requires Fine Screens (<6 mm)		●	●	●	●		●	
	Requires Media Retention Screens			●	●				
	Requires Elevated DO			●	●				
	Only Works with Nitrogen Removal						●		
	Requires Primary Treatment								
	Relatively High Hydraulic Head Loss					●	●		●
	Batch Process								●

OFFEROR'S CERTIFICATION
RFQ NO. 2017-017
EAST WASTEWATER TREATMENT PLANT UPGRADE
FOR THE DEPARTMENT OF ENVIRONMENTAL AND ENGINEERING SERVICES

WHEN OFFEROR IS A CORPORATION

IN WITNESS WHEREOF, the Offeror hereto has executed this Proposal Form this 29th day of June, 2017.

CAROLLO ENGINEERS, INC. CORPORATE SEAL carollo DELAWARE

(CORPORATE SEAL)

Carollo Engineers, Inc.
Printed Name of Corporation

Delaware
Printed State of Incorporation

By: _____
Signature of President or other authorized officer

Elizabeth Fujikawa
Printed Name of President or other authorized officer

ATTEST:

By _____
Secretary

2700 Ygnacio Valley Road, Suite 300
Address of Corporation

Walnut Creek, CA 94598
City/State/Zip

925-932-1710
Business Phone Number

State of Florida
County of Palm Beach ss:

The foregoing instrument was acknowledged before me this 29th day of June, 2017, by Elizabeth Fujikawa (Name), Vice President (Title) of Carollo Engineers (Company Name) on behalf of the corporation, who is personally known to me or who has produced _____ as identification and who did (did not) take an oath.

WITNESS my hand and official seal.

Janice Mudd
NOTARY PUBLIC
State of Florida at Large

JANICE MUDD
Commission # GG 032465
Expires November 14, 2020
Bonded Thru Troy Fain Insurance 800-385-7019

Name of Notary Public
My commission expires:

OFFEROR'S QUALIFICATION STATEMENT RFQ NO. 2017-017

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter:

SUBMITTED TO: City of Margate
(Purchasing Division)

ADDRESS: 5790 Margate Blvd.
Margate, FL 33063

CIRCLE ONE

Corporation
Partnership
Individual
Other

SUBMITTED BY: Elizabeth Fujikawa, PE, BCEE

NAME: Carollo Engineers, Inc.

ADDRESS: 3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021

TELEPHONE NO.: 954-837-0030

FACSIMILE NO.: 954-837-0035

1. State the true, exact, correct and complete name of the partnership, corporation, trade or fictitious name under which you do business and the address of the place of business.

   The correct name of the Offeror is: Carollo Engineers, Inc.

   The address of the principal place of business is:

   3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021

2. If Offeror is a corporation, answer the following:

   a. Date of Incorporation: May 13, 2010

   b. State of Incorporation: Delaware

c. President's name: Balakrishnan Narayanan

d. Vice President's name: Elizabeth Fujikawa

e. Secretary's name: Michael W. Barnes

f. Treasurer's name: Ash Wason

g. Name and address of Resident Agent: Elizabeth Fujikawa

3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021

3. If Offeror is an individual or a partnership, answer the following:

a. Date of organization: N/A

b. Name, address and ownership units of all partners:

N/A

c. State whether general or limited partnership: N/A

4. If Offeror is other than an individual, corporation or partnership, describe the organization and give the name and address of principals:

N/A

5. If Offeror is operating under a fictitious name, submit evidence of compliance with the Florida Fictitious Name Statute.

6. How many years has your organization been in business under its present business name? 7 years - Since May 13, 2010

a. Under what other former names has your organization operated?

Carollo was established in Phoenix, AZ, in 1933 as Headman, Ferguson and Carollo.

In 1957 it was renamed John A. Carollo, Consulting Engineers. The firm was renamed

Carollo Engineers in 1996 and incorporated in 1998 under the name of Carollo Engineers P.C.

On May 13, 2010, the firm was converted from an Arizona P.C. to a Delaware corporation

under the name of Carollo Engineers, Inc.

7. Indicate registration, license numbers or certificate numbers for the businesses or professions which are the subject of this Proposal. Please attach certificate of competency and/or state registration.

State of Florida Department of State document number:F00000003055

State of Florida Board of Professional Engineers License No: 8571

Certificates are attached on the following page.

8. Have you ever failed to complete any work awarded to you? If so, state when, where and why?

N/A

THE OFFEROR ACKNOWLEDGES AND UNDERSTANDS THAT THE INFORMATION CONTAINED IN RESPONSE TO THIS QUALIFICATION STATEMENT SHALL BE RELIED UPON BY OWNER IN AWARDING THE CONTRACT AND SUCH INFORMATION IS WARRANTED BY OFFEROR TO BE TRUE. THE DISCOVERY OF ANY OMISSION OR MISSTATEMENT THAT MATERIALLY AFFECTS THE OFFEROR'S QUALIFICATIONS TO PERFORM UNDER THE CONTRACT SHALL CAUSE THE OWNER TO REJECT THE PROPOSAL, AND IF AFTER THE AWARD TO CANCEL AND TERMINATE THE AWARD AND/OR CONTRACT.

Signature: _____

State of Florida

County of Palm Beach ss:

The foregoing instrument was acknowledge before me this 29th day of June, 2017, by Elizabeth Fujikawa, who is personally known to me or who has produced _____, as identification and who did (did not) take an oath.

WITNESS my hand and official seal.

_____
NOTARY PUBLIC
State of Florida at large

JANICE MUDD
Commission # GG 032465
Expires November 14, 2020
Bonded Thru Troy Fain Insurance 800-385-7019

_____
Name of Notary Public
My commission expires:

CITY OF
MARGATE
Together We Make It Great

NON-COLLUSIVE AFFIDAVIT FOR RFQ 2017-017

State of Florida)
)ss:
County of Palm Beach)

Elizabeth Fujikawa, being first duly sworn, deposes and says that:

He/she is the Vice President (Owner, Partner, Officer, Representative or Agent) of Carollo Engineers the Offeror that has submitted the attached Proposal;

He/she is fully informed regarding the preparation and contents of the attached Proposal and of all pertinent circumstances regarding such Proposal;

Such Proposal is genuine and is not a collusive or sham Proposal;

Neither the Offeror nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, have in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Offeror, firm, or person to submit a collusive or sham Proposal in connection with the Work for which the attached Proposal has been submitted; or to refrain from bidding in connection with such Work; or have in any manner, directly or indirectly, sought by agreement or collusion, or communication, or conference with any Offeror, firm, or person to fix the price or prices in the attached Proposal or of any other Offeror, or to fix any overhead, profit, or cost elements of the Proposal price or the Proposal price of any other Offeror, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against (Recipient), or any person interested in the proposed Work;

The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Offeror or any other of its agents, representatives, owners, employees or parties in interest, including this affiant.

Signed, sealed and delivered in the presence of:

Witness

Witness

By _____

ELIZABETH FUJIKAWA
Printed Name

VICE PRESIDENT
Title

ACKNOWLEDGMENT
NON-COLLUSIVE AFFIDAVIT FOR RFQ 2017-017

State of Florida)
) ss:
County of Palm Beach)

BEFORE ME, this 29th day of June, 2017, personally appeared Elizabeth Fujikawa _____, (Name(s) of individual(s) who appeared before notary), and who did/ did not take an oath, and acknowledged before me that he/she/it executed same.

WITNESS my hand and official seal.

Janice Mudd
Notary Public
State of Florida at Large

My commission expires:

JANICE MUDD
Commission # GG 032465
Expires November 14, 2020
Bonded Thru Troy Fain Insurance 800-385-7019

ACKNOWLEDGEMENT FORM

ADDENDUM NO. 1

RFQ NO. 2017-017
DESIGN SERVICES FOR EAST WASTEWATER TREATMENT PLANT UPGRADE ENGINEERING

I acknowledge receipt of Addendum No. 1 for RFQ No. 2017-001, Design Services for East Wastewater Treatment Plant Upgrade Engineering. This addendum contains nine (9) pages. Please include the original of this form in your RFQ submission.

Company Name: Carollo Engineers, Inc.

Address: 3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021

Name of Signer (please print) Elizabeth Fujikawa

Signature: _____ Date: 6/29/17

Telephone: 954-837-0030 Facsimile: 954-837-0035

Please fax your completed form to (954) 935-5258 or e-mail to purchase@margatefl.com.

S. Shambray

Spencer Shambray, CPPB
Purchasing Manager
6/21/17

NOTE: The original of this form must be included with your RFQ response.

ACKNOWLEDGEMENT FORM

ADDENDUM NO. 2

RFQ NO. 2017-017
DESIGN SERVICES FOR EAST WASTEWATER TREATMENT PLANT UPGRADE ENGINEERING

I acknowledge receipt of Addendum No. 2 for RFQ No. 2017-017, Design Services for East Wastewater Treatment Plant Upgrade Engineering. This addendum contains five (5) pages. Please include the original of this form in your RFQ submission.

Company Name: Carollo Engineers, Inc.

Address: 3440 Hollywood Boulevard, Suite 465, Hollywood, Florida 33021

Name of Signer (please print): Elizabeth Fujikawa

Signature: _____ Date: 6/29/17

Telephone: 954-837-0030 Facsimile: 954-837-0035

Please fax your completed form to (954) 935-5258 or e-mail to purchase@margatefl.com.

S. Shambray

Spencer Shambray, CPPB
Purchasing Manager
6/27/17

NOTE: The original of this form must be included with your RFQ response.

State of Florida
Department of State

I certify from the records of this office that CAROLLO ENGINEERS, INC. is a Delaware corporation authorized to transact business in the State of Florida, qualified on May 25, 2000.

The document number of this corporation is F00000003055.

I further certify that said corporation has paid all fees due this office through December 31, 2017, that its most recent annual report/uniform business report was filed on April 6, 2017, and that its status is active.

I further certify that said corporation has not filed a Certificate of Withdrawal.

Given under my hand and the Great Seal of the State of Florida at Tallahassee, the Capital, this the Tenth day of April, 2017

Ken Detzner

Secretary of State

Tracking Number: CU6907316309

To authenticate this certificate,visit the following site,enter this number, and then follow the instructions displayed.

https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication

State of Florida

Board of Professional Engineers

Attests that

Carollo Engineers, Inc.

FBPE
FLORIDA BOARD OF PROFESSIONAL ENGINEERS

Is authorized under the provisions of Section 471.023, Florida Statutes, to offer engineering services to the public through a Professional Engineer, duly licensed under Chapter 471, Florida Statutes.

Expiration: 2/28/2019

Audit No: 228201901827 R

CA Lic. No: 8571

State of Florida

Minority, Women & Florida Veteran Business Certification

Chen Moore and Associates

Is certified under the provisions of
287 and 295.187, Florida Statutes, for a period from:

02/26/2016 to 02/26/2018

Chad Poppell, Secretary
Florida Department of Management Services

ARCHITECT – ENGINEER QUALIFICATIONS

PART I – CONTRACT SPECIFIC QUALIFICATIONS

A. CONTRACT INFORMATION

1. TITLE AND LOCATION *(City and State)*
Design Services for East Wastewater Treatment Plant Upgrade Engineering, City of Margate, Florida

2. PUBLIC NOTICE DATE
June 15, 2017

3. SOLICITATION OR PROJECT NUMBER
2017-017

B. ARCHITECT – ENGINEER POINT OF CONTACT

4. NAME AND TITLE
Randy Braley, Project Manager

5. NAME OF FIRM
Carollo Engineers, Inc.

6. TELEPHONE NUMBER
561-508-1704

7. FAX NUMBER

8. E-MAIL ADDRESS
bbraley@carollo.com

C. PROPOSED TEAM

(Complete this section for the prime contractor and all key subcontractors.)

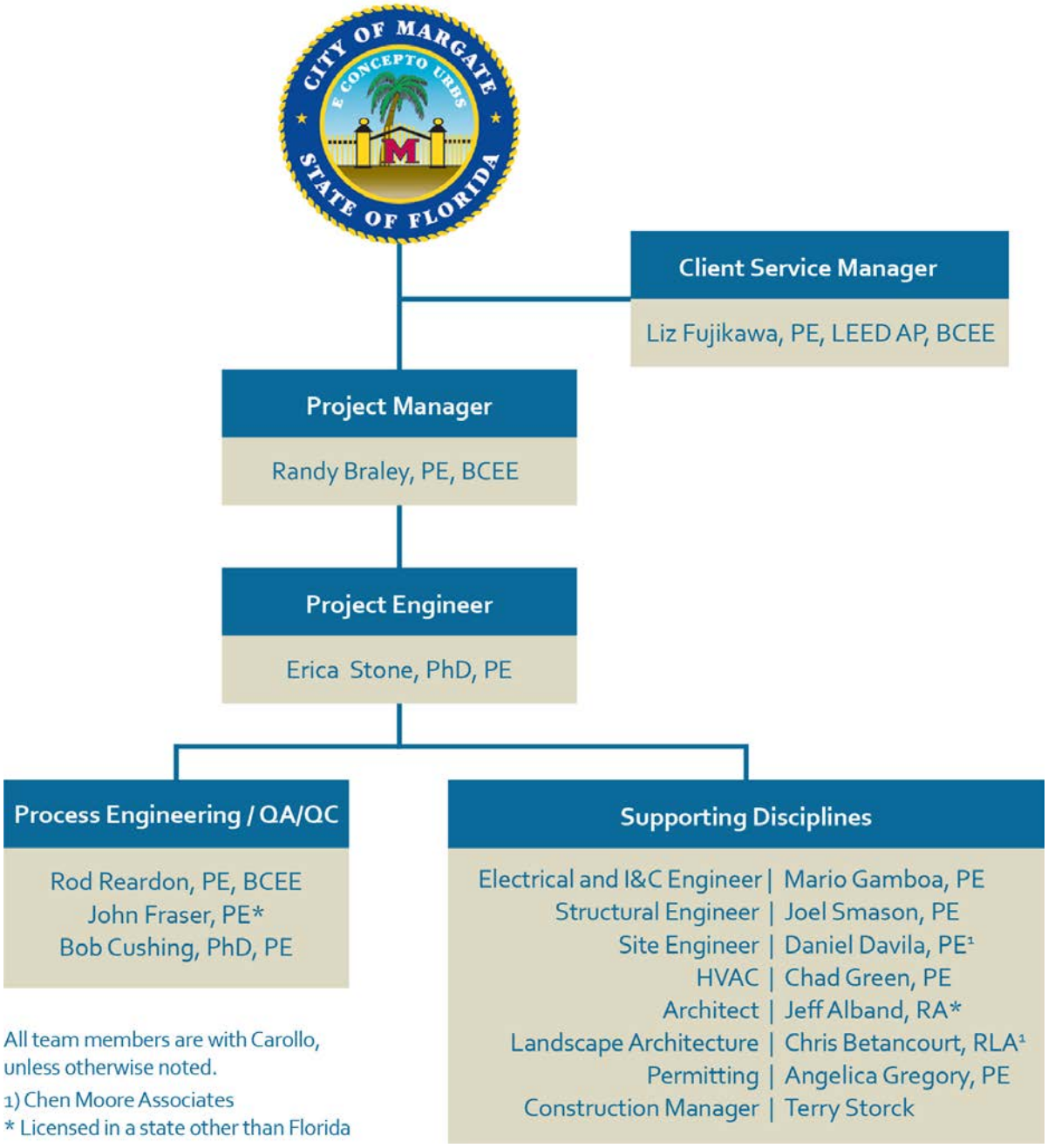
	(Check) PRIME	J-V PARTNER	SUBCON-TRACTOR	9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
a.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	3440 Hollywood Boulevard, Suite 465, Hollywood, FL 33021	Prime
b.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	9897 Lake Worth Road, Suite 302 Lake Worth, FL 33467	Technical Support
c.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	200 East Robinson Street, Suite 1400 Orlando, FL 32801	Technical Support
d.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	401 North Cattlemen Road, Suite 306 Sarasota, FL 34232	Technical Support
e.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	Signature Place II 14785 Preston Road, Suite 950 Dallas, TX 75254	Technical Support
f.	X			Carollo Engineers, Inc. **[X]** CHECK IF BRANCH OFFICE	390 Interlocken Crescent, Suite 800 Broomfield, CO 80021	Technical Support

C. PROPOSED TEAM

(Complete this section for the prime contractor and all key subcontractors.)

	(Check)			9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
	PRIME	J-V PARTNER	SUBCON-TRACTOR			
g.			**X**	Chen Moore **[X]** CHECK IF BRANCH OFFICE	500 W. Cypress Creek Road, Suite 630 Fort Lauderdale, FL 33309	Civil/Site Engineering / Landscape Architecture

D. ORGANIZATIONAL CHART OF PROPOSED TEAM **[X]** *(Attached)*


Client Service Manager
Liz Fujikawa, PE, LEED AP, BCEE
Project Manager
Randy Braley, PE, BCEE
Project Engineer
Erica Stone, PhD, PE
Process Engineering / QA/QC
Rod Reardon, PE, BCEE
John Fraser, PE*
Bob Cushing, PhD, PE
Supporting Disciplines
Electrical and I&C Engineer | Mario Gamboa, PE
Structural Engineer | Joel Smason, PE
Site Engineer | Daniel Davila, PE1
HVAC | Chad Green, PE
Architect | Jeff Alband, RA*
Landscape Architecture | Chris Betancourt, RLA1
Permitting | Angelica Gregory, PE
Construction Manager | Terry Storck
All team members are with Carollo, unless otherwise noted.
1) Chen Moore Associates
* Licensed in a state other than Florida

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Brandon (Randy) Braley	Project Manager	35	6 mo.

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Hollywood, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
MS / Civil Engineering BS / Civil Engineering	FL, CT, ME / Professional Engineer MA, NH / Civil Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Randy, a vice president with Carollo, has 35 years of experience serving as strategist and manager for challenging water and wastewater projects for numerous public and private clients, across the U.S. and abroad. Prior to joining Carollo, Randy served as the leader of global business units for a large international consulting firm. He created a sustainable and profitable business operation in Africa, Middle East, and Central Asia Region. He served clients with projects covering water supply, treatment and distribution; wastewater collection, treatment and reuse; sustainability; management consulting; institutional and capacity building; program management; and public education.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
Plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
May 2016	Dec. 2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. The South Central Regional Wastewater Treatment Plant was evaluated to develop a capital expenditure program to meet capacity and R&R needs over the next 20 years. Projects were ranked according to priority and need.

b.

(1) TITLE AND LOCATION *(City and State)*
Naval Facilities Engineering Command (NAVFAC) Design Development and Review of a Wastewater Treatment Process for the Marine Corps Base Camp Pendleton Design-Build Program, San Diego, CA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2011 (2012 overall)	2013

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Manager. Responsible for the design of two biological nitrogen removal water reclamation plants—the new 4-mgd "North" plant and the 2.5-mgd expansion to the "South" plant.

c.

(1) TITLE AND LOCATION *(City and State)*
General Electric Water and Process Technologies JAFZA Water Reclamation Facility, Dubai, United Arab Emirates

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2009	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Project director. This project consisted of the design of a 28-mgd, membrane bioreactor water reclamation facility for build-own-operate delivery by General Electric Water & Process Technologies.

d.

(1) TITLE AND LOCATION *(City and State)*
Sulaibiya Water Reclamation Facility, Build-Operate-Transfer (BOT) Project, Kuwait City, Kuwait

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2007	2007

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Project director/program manager. The project involved program management and BOT advisory services for the 99-mgd water reclamation facility—the world's most advanced project of its kind at the time, which produces high quality water for unrestricted reuse and aquifer recharge. The $450-million privately financed, 30-year concession project uses biological nutrient removal followed by ultrafiltration and reverse osmosis to meet extraordinary effluent requirements.

e.

(1) TITLE AND LOCATION *(City and State)*
Wadi Mousa Wastewater Treatment Plant (funded by the United States Agency for International Development), Water Authority of Jordan, Jordan

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
1996	1998

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Project coordinator. This project consisted of the design of a 1.8-mgd nitrogen removal wastewater treatment plant and effluent reuse system that protects the UNESCO World Heritage Site of Petra.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Elizabeth Fujikawa	Client Service Manager	30	6

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Hollywood, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
MSE / Environmental Engineering BS / Chemistry	FL, IL, WI / Professional Engineer DE / Civil Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Liz, a vice president with Carollo, has more than 30 years of engineering experience. She has served in roles ranging from project manager, technical specialist, to principal-in-charge for municipal clients. Her experience includes studies through construction management for projects with capital construction costs of up to $240 million, including two of the U.S.'s largest treatment plants: Chicago's Jardine Water Plant (1,000 mgd), and the Metropolitan Water Reclamation District of Greater Chicago's Stickney Water Reclamation Plant (1,200 mgd).

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
East Wastewater Treatment Plant IFAS Evaluation, City of Margate, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Client service manager. Evaluated feasibility, hydraulic analysis, and retrofit requirements to incorporate IFAS into the aeration basins and increase capacity. Developed an opinion of probable cost.

b.

(1) TITLE AND LOCATION *(City and State)*
Plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
May 2016	Dec. 2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Client service manager. The South Central Regional Wastewater Treatment Plant was evaluated to develop a capital expenditure program to meet capacity and R&R needs over the next 20 years. Projects were ranked according to priority and need.

c.

(1) TITLE AND LOCATION *(City and State)*
Bulk Sodium Hypochlorite Storage and Feed Facility for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Feb. 2017	On-going

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project manager. The facility will receive and store 12.5% sodium hypochlorite and meter the feed to the inlet to the tertiary filters for reuse.

d.

(1) TITLE AND LOCATION *(City and State)*
Electrical System Master Plan for the City of Pompano Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2014	On-going

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project manager. Work to date includes motor control center replacements and installation of new variable frequency drives for the high service pump station. Services include final design and opinion of construction cost, bidding services, and construction support services.

e.

(1) TITLE AND LOCATION *(City and State)*
Progressive Design Build of an Ion Exchange System for the East Water Treatment Plant, City of Boynton Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2015	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project manager. The project retrofit an ion exchange process for pretreatment at the East Water Treatment Plant. Work included analysis of existing hydraulic profile, transmission main hydraulics, construction of a new concrete basin, influent modulating valves for flow split, and resin storage retrofit into an existing building.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Erica Stone	Project Engineer	8	8

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Orlando, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
PhD / Environmental Engineering BS / Environmental Engineering	FL / Professional Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Erica joined the Carollo team in March 2009. She possesses a Ph.D. in environmental engineering and brings several years of experience with her in the areas of water quality, water treatment, environmental studies, sampling, research, and data analysis.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
East Wastewater Treatment Plant IFAS Evaluation, City of Margate, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Process specialist. This project consisted of an engineering evaluation and development of a cost estimate for expanding the East WWTP with an integrated fixed-film activated sludge (IFAS) process.

b.

(1) TITLE AND LOCATION *(City and State)*
Eastern Water Reclamation Facility Plan for Orange County Utilities, Orlando, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
On-going	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. This project consisted of a Facility Plan for the expansion of EWRF from 24 to 29 mgd capacity. The Facility Plan also included analysis of the future loads to EWRF, which includes leachate from the County's landfill with analysis of alternatives for treatment of leachate with Annamox using IFAS technology and/or equalization of leachate at the landfill site.

c.

(1) TITLE AND LOCATION *(City and State)*
Conserv II WRF Effluent Analyzer Storage Improvements project for the City of Orlando, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2015	2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project manager and project engineer. Project included replacing storage sheds, water quality analyzers, and sampling pumps at chlorine contact tank as well as electrical upgrades. Project included preliminary and detailed design as well as construction phase services.

d.

(1) TITLE AND LOCATION *(City and State)*
Northwest Service Area Discharge Elimination planning for Hillsborough County, Tampa, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2013	On-going

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. Responsibilities included WRF process selection alternatives analysis, cost estimating, and consolidation evaluation for the existing facilities in the Northwest Service Area. Alternatives included IFAS, BioMag, Step-Feed, and Bardenpho treatment processes.

e.

(1) TITLE AND LOCATION *(City and State)*
Evaluating alternatives for upgrading the Southwest Water Reclamation Facility for nitrogen removal for Manatee County, Bradenton, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2012	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. This project included process alternative evaluation, selection, and a facility plan for implementation to upgrading a secondary plant for partial nitrogen removal. The alternative treatment processes evaluated included MLE, step-feed, bioaugmentation, Bardenpho, and IFAS.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Rod Reardon	Process Engineering / QA/QC	38	11

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Orlando, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
MS / Civil and Sanitary Engineering BS / Chemical Engineering	FL, AL, MS, PA, TN, WA / Professional Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Rod is an environmental engineer with 38 years of experience in the study, design, and operation of municipal wastewater facilities. He has particular expertise in advanced wastewater treatment processes, including membrane technologies, for the removal of nutrients and for producing reclaimed water fit for various types of reuse.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
East Wastewater Treatment Plant IFAS Evaluation, City of Margate, FL	2016	N/A
(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	[X] Check if project performed with current firm	

Process specialist. Evaluated feasibility, hydraulic analysis, and retrofit requirements to incorporate IFAS into the aeration basins and increase capacity. Developed an opinion of probable cost.

b.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL	May 2016	Dec. 2016
(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	[X] Check if project performed with current firm	

Process specialist. The South Central Regional Wastewater Treatment Plant was evaluated to develop a capital expenditure program to meet capacity and R&R needs over the next 20 years. Projects were ranked according to priority and need.

c.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
City of Tallahassee Lake Bradford Road WWTF Upgrades Design, Tallahassee, FL	2007	N/A
(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	[X] Check if project performed with current firm	

Process engineer. Carollo was selected to facility improvements for the LBRWWTF. The existing conventional activated sludge process was to be upgraded to a 4.5-mgd MBR process incorporating a biological nitrogen removal process (BNR) to meet the new nitrogen limits. IFAS was evaluated as part of the interim operation alternatives.

d.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
Hillsborough County Valrico Advanced Wastewater Treatment Facility Condition Assessment, Tampa, FL	2010	N/A
(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	[X] Check if project performed with current firm	

Process engineer/advisor. This project was required by consent order as a result of violations of the effluent total nitrogen limit. Participated in a team of engineers who conducted site visits, evaluated performance data, and assessed equipment and operating protocols to identify the causes and remedies for the permit violations.

e

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	PROFESSIONAL SERVICES
Orange County Utilities Northwest Water Reclamation Facility Phase III Improvements, Orlando, FL	2009	2013
(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	[X] Check if project performed with current firm	

VE team member/process specialist. This expanded the plant treatment capacity from 7.5 mgd to 11.25 mgd and upgraded the facility to meet Florida effluent limits for advanced wastewater treatment, June 2009.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
John Fraser	Process Engineering / QA/QC	34	31

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Broomfield, CO

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
MS / Environmental Engineering BS / Civil Engineering	CA / Civil Engineer CO / Civil Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
John, a senior vice president and Wastewater Practice Director with Carollo, specializes in the planning and design of wastewater treatment facilities. His experience includes facilities incorporating state-of-the-art treatment systems such as solids contact aeration, continuous backwash filtration systems, ultra-high efficiency aeration, egg-shaped anaerobic digestion, and hypochlorination.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
City of Colony Stewart Creek WWTP Optimization Study and Facility Plan, Colony, TX

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2012	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Technical reviewer. Carollo evaluated treatment performance for the 3.4-mgd Stewart Creek WWTP and recommended improvements to meet existing and future discharge regulations, decrease energy consumption, and improve plant operability. As part of this project, Carollo evaluated and troubleshooted existing IFAS process (fixed media), and compared to other process alternatives (IFAS with free-floating media, CAS, MBR) for plant expansion to 6.1 mgd.

b.

(1) TITLE AND LOCATION *(City and State)*
Upper Blue Sanitation District Farmers Korner Wastewater Treatment Plant Expansion, Breckenridge, CO

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2009	2011

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Technical reviewer. Carollo completed an expansion of the Farmers Korner Wastewater Treatment Plant to 6 mgd for the Upper Blue Sanitation District (UBSD) to accommodate future growth. IFAS was evaluated as a process alternative. The expansion includes a headworks, influent pumping, activated sludge, secondary clarification, chemical phosphorus removal using high-rate flocculation/clarification (Densadeg), dual-media filtration, disinfection, and aerobic digestion.

c.

(1) TITLE AND LOCATION *(City and State)*
Metro Wastewater Reclamation District PAR 1085 South Secondary Complex Construction Management, Denver, CO

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2011	2015

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge/Project manager. Carollo was selected to provide $19 million in design services for the South Secondary Complex. The project is required to meet new, more restrictive criteria of less than 2 mg/L ammonia and 10 mg/L nitrate for discharge to the South Platte River. The project includes six new 16.7-mgd aeration basins designed for three-stage nitrification/denitrification. The project also included three novel centrate and RAS re-aeration Basins (CaRRBs) to treat the

d.

(1) TITLE AND LOCATION *(City and State)*
Metro Wastewater Reclamation District PAR 942 North Secondary Treatment Improvements, Denver, CO

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2007	2011

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Carollo perform improvements to the 160-mgd plant. The North Plant is an air activated sludge process designed for nitrification and denitrification. Carollo provided preliminary and final design engineering of two important components of the facility upgrades required to move the CTP facility toward compliance with future discharge criteria. The cost for the secondary treatment improvements was $55 million.

e.

(1) TITLE AND LOCATION *(City and State)*
King County Department of Natural Resources and Parks West Point Treatment Plant Nutrient Removal Study, Seattle, WA

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2010	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Technical advisor. In order to assess site-specific impacts of potential future regulations for nitrogen and potential phosphorus discharge to Puget Sound, King County selected Carollo Engineers to complete an initial evaluation of nutrient (and future phosphorus) removal alternatives at its two largest treatment facilities: South Treatment Plant (STP - 144 mgd) and West Point (WPTP - 215 mgd). Carollo evaluated IFAS as a process alternative for nitrogen removal and capacity upgrade of high purity

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
Bob Cushing	Process Engineering / QA/QC	a. TOTAL: 27	b. WITH CURRENT FIRM: 19

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Sarasota, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
PhD Civil Engineering MS / Civil Engineering BS / Petroleum Engineering	FL, NC, SC, VA / Professional Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Bob, a senior vice president with Carollo, has 27 years of experience in applied environmental science and engineering. Throughout his career, he has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water and wastewater utilities. He has been responsible for numerous successful treatment facility planning and design projects, as well as studies and programs for improving distribution system water quality.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*: Manatee County Southwest Water Reclamation Facility Improvements, Bradenton, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2011 - Present; CONSTRUCTION *(If applicable)*: 2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Design improvements consisted of the following: headwork rehabilitation, new clarifier mechanisms, new variable frequency drives, new scum pumping systems, and new electrical and I&C wiring and conduits. Carollo also evaluated IFAS as a process alternative for this improvement project.

b.

(1) TITLE AND LOCATION *(City and State)*: Central County Water Reclamation Facility Design (Multiple Phases), Sarasota, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2004 - 2012; CONSTRUCTION *(If applicable)*: 2012

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Carollo performed a preliminary design study, which included identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required for a phased expansion to 5.4 mgd (Phase 2) and then 8.0 mgd (Phases 2B and 3). Phase 2 increased the CCWRF capacity to 5.4 mgd maximum month average daily flow (MMADF). Major electrical modifications were also completed.

c.

(1) TITLE AND LOCATION *(City and State)*: Miscellaneous Projects for Hillsborough County Tampa, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2010-Present; CONSTRUCTION *(If applicable)*: N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Hillsborough County selected Carollo as Utility Bond Engineer to perform services at their wastewater plants. Relevant projects include: Annual Facilities Review; 12-mgd Valrico AWTF Regulatory Compliance Facilitation; Northwest WW Master Planning Assistance, and SCADA master plan.

d.

(1) TITLE AND LOCATION *(City and State)*: Lake Bradford Road WWTF Upgrades Design Tallahassee, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2007; CONSTRUCTION *(If applicable)*: N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Lake Bradford Road WWTF Upgrades Design, Tallahassee, FL. Carollo was selected to facility improvements for the LBRWWTF. In general, the existing conventional activated sludge process was to be upgraded to a 4.5-mgd MBR process incorporating a biological nitrogen removal process (BNR) to meet the new nitrogen limits. IFAS was evaluated as part of the interim operation alternatives.

e.

(1) TITLE AND LOCATION *(City and State)*: Orange County Utilities, Program Management Wastewater Services, Orlando, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2009 - On-going; CONSTRUCTION *(If applicable)*: 2010

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Principal-in-charge. Orange County Utilities (OCU) selected Carollo to perform services at their wastewater plants, including a cloth disk filter evaluation study; studies to reduce nutrients and overall plant optimization; pilot- and full-scale demonstration studies of alternative processes and configurations; energy optimization studies; facility planning for a new 5-mgd WRF and 40-mgd WRF, design for expansion of a 43-mgd WRF; and construction management services (CMS) for an 11-mgd WRF and a 24-mgd WRF. This is a multi-year contract that began in June 2009. Carollo was re-selected for another 5-year term with OCU.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Joel Smason	Structural Engineer	41	21

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Phoenix, AZ

16. EDUCATION *(DEGREE AND SPECIALIZATION)*
MS / Structural Engineering
BS / Structural Engineering

17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
FL, IL, MO, NC, SC, TX / Professional Engineer
NV / Civil Engineer
AZ, CA, IL, NM / Structural Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Joel has 40 years of experience as a structural design engineer for water and wastewater treatment plants and nuclear power plant design. As a senior structural design engineer, Joel's responsibilities include preparation of preliminary structural designs, client assistance, supervision of personnel, preparation of budgets and estimates, and the development of detailed drawings and specifications. He also has experience with alternative project delivery methods including design-build and construction manager at risk (CMAR).

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
East Wastewater Treatment Plant IFAS Evaluation, City of Margate, FL

(2) YEAR COMPLETED
PROFESSIONAL SERVICES: 2016
CONSTRUCTION *(If applicable)*: N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Structural engineer for the City of Margate, FL, Evaluation of East Wastewater Treatment Plant Upgrade using IFAS Technology.

b.

(1) TITLE AND LOCATION *(City and State)*
Pasco County Utilities Branch (PCUB) Wesley Center Wastewater Treatment Plant Rehabilitation Expansion, New Port Richey, FL

(2) YEAR COMPLETED
PROFESSIONAL SERVICES: 2016
CONSTRUCTION *(If applicable)*: 2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Structural engineer. PCUB selected Carollo to perform a condition assessment and full facility evaluation to identify and prioritize the improvements to the WCWWTP. Carollo completed the preliminary evaluation, facility plan design and construct the first phase of improvements which will increase the facility from 6.0 mgd to 9.0 mgd.

c.

(1) TITLE AND LOCATION *(City and State)*
Manatee County Southwest Water Reclamation Facility Improvements, Bradenton, FL

(2) YEAR COMPLETED
PROFESSIONAL SERVICES: 2011 - Present
CONSTRUCTION *(If applicable)*: 2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Structural engineer. Design improvements consisted of the following: headwork rehabilitation, new clarifier mechanisms, new variable frequency drives, new scum pumping systems, and new electrical and I&C wiring and conduits. Carollo also evaluated IFAS as a process alternative for this improvement project.

d.

(1) TITLE AND LOCATION *(City and State)*
Central County Water Reclamation Facility Design (Multiple Phases), Sarasota, FL

(2) YEAR COMPLETED
PROFESSIONAL SERVICES: 2004 - 2012
CONSTRUCTION *(If applicable)*: 2012

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Structural engineer. Carollo performed a preliminary design study, which included identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required for a phased expansion to 5.4 mgd (Phase 2) and then 8.0 mgd (Phases 2B and 3). Phase 2 increased the CCWRF capacity to 5.4 mgd maximum month average daily flow (MMADF). Major electrical modifications were also completed.

e.

(1) TITLE AND LOCATION *(City and State)*
City of Tallahassee Lake Bradford Road WWTF Upgrades Design, Tallahassee, FL

(2) YEAR COMPLETED
PROFESSIONAL SERVICES: 2007
CONSTRUCTION *(If applicable)*: N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Structural engineer. Carollo was selected to facility improvements for the LBRWWTF. The existing conventional activated sludge process was to be upgraded to a 4.5-mgd MBR process incorporating a biological nitrogen removal process (BNR) to meet the new nitrogen limits. IFAS was evaluated as part of the interim operation alternatives.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Chad Green	HVAC	8	4

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Dallas, TX

16. EDUCATION *(DEGREE AND SPECIALIZATION)*
BS / Mechanical Engineering

17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
FL, AR, CO, IL, NM, OK, OR, TX, WA / Professional Engineer
AZ, CA, NE / Mechanical Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Chad, a senior building mechanical engineer with Carollo, has 8 years of engineering experience in various building mechanical designs for water and wastewater facility projects as well as odor control and fuel systems. As a building mechanical engineer, Chad provides all aspects of design services associated with the design of air, heating, cooling, controls, plumbing systems, fire protection systems, odor treatment, and fuel systems.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
Manatee County Southwest Water Reclamation Facility Improvements, Bradenton, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2011 - Present	2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

HVAC/Mechanical engineer. Design improvements consisted of the following: headwork rehabilitation, new clarifier mechanisms, new variable frequency drives, new scum pumping systems, and new electrical and I&C wiring and conduits. Carollo also evaluated IFAS as a process alternative for this improvement project.

b.

(1) TITLE AND LOCATION *(City and State)*
Pasco County Utilities Branch (PCUB) Wesley Center Wastewater Treatment Plant Rehabilitation Expansion, New Port Richey, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

HVAC/Mechanical engineer. PCUB selected Carollo to perform a condition assessment and full facility evaluation to identify and prioritize the improvements to the WCWWTP. Carollo completed the preliminary evaluation, facility plan design and construct the first phase of improvements which will increase the facility from 6.0 mgd to 9.0 mgd.

c.

(1) TITLE AND LOCATION *(City and State)*
Orange County Utilities, Program Management Wastewater Services, Orlando, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2009 - Ongoing	2010

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

HVAC/Mechanical engineer. Orange County Utilities (OCU) selected Carollo to perform services at their wastewater plants, including a cloth disk filter evaluation study; studies to reduce nutrients and overall plant optimization; pilot- and full-scale demonstration studies of alternative processes and configurations; energy optimization studies; facility planning for a new 5-mgd WRF and 40-mgd WRF, design for expansion of a 43-mgd WRF; and construction management services (CMS) for an 11-mgd WRF and a 24-mgd WRF. This is a multi-year contract that began in June 2009. Carollo was re-selected for another 5-year term with OCU.

d.

(1) TITLE AND LOCATION *(City and State)*
Central County Water Reclamation Facility Design (Multiple Phases), Sarasota, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2004 - 2012	2012

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

HVAC/Mechanical engineer. Carollo performed a preliminary design study, which included identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required for a phased expansion to 5.4 mgd (Phase 2) and then 8.0 mgd (Phases 2B and 3). Phase 2 increased the CCWRF capacity to 5.4 mgd maximum month average daily flow (MMADF). Major electrical modifications were also completed.

e.

(1) TITLE AND LOCATION *(City and State)*
South Florida Water Management District S-470 Pump Station and S-483 Control Building, West Palm Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2017	

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Lead building mechanical engineer. Supervised junior engineers for HVAC/plumbing calculations, designs, code reviews, drawings, and construction services related to the S-470 Pump Station and S-483 Control Building. Scope included a pump station which included a pump room, below grade pipe gallery, workshop, locker room, restrooms, break rooms, and control room.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Jeff Alband	Architect	46	38

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Phoenix, AZ

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
BS / Architecture	AZ, CO, IL, MI, UT / Architect

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Jeffrey, a senior architect with Carollo, has more than 46 years of experience in the architectural design, planning, detailing, and specifications of water and wastewater treatment plants. He works closely with our engineering staff to develop architectural concepts for structures with low-visibility from surrounding neighborhoods, and a low-profile design to blend visually in with the surrounding terrain. Many of these structures include administration, operation, and headworks buildings, as well as microbiology and instrumentation laboratories, and reservoirs.

19. RELEVANT PROJECTS

a

(1) TITLE AND LOCATION *(City and State)*
Orange County Utilities Northwest Water Reclamation Facility Phase III Improvements, Orlando, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2009	2013

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Architect. This expanded the plant treatment capacity from 7.5 mgd to 11.25 mgd and upgraded the facility to meet Florida effluent limits for advanced wastewater treatment, June 2009.

b.

(1) TITLE AND LOCATION *(City and State)*
Pasco County Utilities Branch (PCUB) Wesley Center Wastewater Treatment Plant Rehabilitation Expansion, New Port Richey, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Architect. PCUB selected Carollo to perform a condition assessment and full facility evaluation to identify and prioritize the improvements to the WCWWTP. Carollo completed the preliminary evaluation, facility plan design and construct the first phase of improvements which will increase the facility from 6.0 mgd to 9.0 mgd.

c.

(1) TITLE AND LOCATION *(City and State)*
Progressive Design Build of an Ion Exchange System for the East Water Treatment Plant, City of Boynton Beach, FL

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2015	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Architect. The project retrofit an ion exchange process for pretreatment at the East Water Treatment Plant. Work included analysis of existing hydraulic profile, transmission main hydraulics, construction of a new concrete basin, influent modulating valves for flow split, and resin storage retrofit into an existing building.

d.

(1) TITLE AND LOCATION *(City and State)*
City of Pompano Beach WTP Transfer Pump Station Improvements

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Architect. This project provides for redundancy and reliability for the City's water treatment plants, specifically the transfer of treated water into the clearwell. Project included: 1)Assessment of remedies to an apparent hydraulic bottleneck into the transfer station; 2) Selection of a motor and the Installation of two vertical turbine pumps owned by the City; 3) Upgrade of electrical equipment for the transfer station; 4) Ancillary improvements for HVAC, access, lighting and wall insulation in the transfer station.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Angelica Gregory	Permitting	14	6

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Lake Worth, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*
PhD / Civil Engineering
MS / Civil and Environmental Engineering
BS / Civil Engineering

17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
FL / Professional Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Angelica is a civil and environmental engineer with 13 years of combined experience in the water and wastewater consulting industry and in environmental engineering research. Her background includes hydraulic modeling, water quality, physical and chemical treatment processes, pilot investigations, water and sewer networks, and remediation of soils and groundwater. She has also worked on several Florida projects that involved permitting efforts.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
City of Pompano Beach Concentrate Disposal Project - Permitting

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2015	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. This project consists of the evaluation of blending of demineralized concentrate (concentrate) with reclaimed water prior to distribution to City of Pompano Beach reuse customers. This evaluation considered the resulting water quality of the blended streams with respect to its suitability for use as a source of irrigation water as well as compliance with groundwater quality requirements associated with the City's reuse system. Responsibilities included permitting effort.

b.

(1) TITLE AND LOCATION *(City and State)*
Sunrise Sawgrass WTP Membrane Element Replacement and IX Addition Design, Sunrise, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2015	2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

This project consists of the evaluation and alternative analysis to expand the potable water treatment capacity from 18 mgd to 36 mgd, increase the overall facility water recovery, improve potable water quality and provide an analysis of options for new brackish water treatment facilities. Preliminary estimated cost of the main improvements is $35 million. Responsibilities included the creation of conceptual design, alternative analysis, reports, and permitting.

c.

(1) TITLE AND LOCATION *(City and State)*
Palm Beach County WTP 2 Filter Replacement Project, West Palm Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2013	2015

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer. Carollo provided study and design phase services for the filter replacement project at PBCWUD WTP No. 2. The project included replacement of the existing steel vessel dual media filters with new dual media filters, transfer and backwash pumping station, clearwell, and backwash recovery system.

d.

(1) TITLE AND LOCATION *(City and State)*
Miami-Dade County Wastewater Pump Station Condition Simulation

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2010	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Project engineer. Project engineer for the Hialeah Water and Sewers Department, wastewater pump stations high flow condition simulations, including evaluation of impacts of wet weather on lift stations neighboring Pump Station 106, a booster station that transmitted flow into the Miami Dade County collection system. Responsibilities also included permitting effort.

e.

(1) TITLE AND LOCATION *(City and State)*
City of Plantation Wastewater Collection System Modeling, Plantation, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2014	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project engineer/assistant project manager. A hydraulic model of the City's wastewater collection system was developed and calibrated. Hydraulic simulations of different scenarios such as emergency conditions, planned development, and projected growth were developed and cost-weighed solutions were provided.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Mario Gamboa	Electrical and I&C Engineer	38	20

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Hollywood, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
BS / Electrical Engineering	FL / Electrical Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Gamboa's professional experience spans 38 years in electrical design; estimating; value engineering; construction cost; and construction management of numerous industrial, municipal, and commercial projects. These include wastewater treatment plants, health facilities, military structures, airport facilities, computer centers, electronics manufacturing, rapid transit, and processing plants. He has provided electrical design and construction specifications for 115 -kV, medium voltage class (5-kV through 38-kV), and low-voltage power distribution systems; 5-kV and low-voltage pump and motor speed controls systems; lighting systems; life safety systems; grounding; lightning protection; and SCADA automation systems.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
East Wastewater Treatment Plant IFAS Evaluation, City of Margate, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Electrical & I&C engineer for the City of Margate, FL, Evaluation of East Wastewater Treatment Plant Upgrade using IFAS Technology.

b.

(1) TITLE AND LOCATION *(City and State)*
Pasco County Utilities Branch (PCUB) Wesley Center Wastewater Treatment Plant Rehabilitation Expansion, New Port Richey, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016	2018 (Est.)

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Electrical & I&C engineer. PCUB selected Carollo to perform a condition assessment and full facility evaluation to identify and prioritize the improvements to the WCWWTP. Carollo completed the preliminary evaluation, facility plan design and construct the first phase of improvements which will increase the facility from 6.0 mgd to 9.0 mgd.

c.

(1) TITLE AND LOCATION *(City and State)*
Plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
May 2016	Dec. 2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Electrical & I&C engineer. The South Central Regional Wastewater Treatment Plant was evaluated to develop a capital expenditure program to meet capacity and R&R needs over the next 20 years. Projects were ranked according to priority and need.

d.

(1) TITLE AND LOCATION *(City and State)*
Central County Water Reclamation Facility Design (Multiple Phases), Sarasota, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2004 - 2012	2012

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Electrical & I&C engineer. Carollo performed a preliminary design study, which included identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required for a phased expansion to 5.4 mgd (Phase 2) and then 8.0 mgd (Phases 2B and 3). Phase 2 increased the CCWRF capacity to 5.4 mgd maximum month average daily flow (MMADF). Major electrical modifications were also completed.

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Terry Storck	Construction Manager	23	4

15. FIRM NAME AND LOCATION *(City and State)*
Carollo Engineers, Inc., Lake Worth, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Robotics Engineering, University of Michigan, Ann Arbor	

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Terry's background focuses on the planning, scheduling, inspections, and coordination of complex projects. He possesses technical knowledge and background in the mechanical, electrical, SCADA, computing and electronic communications areas. Terry is a project administrator capable of managing a staff of construction inspectors, and focuses on completing the job on time and under budget, while maintaining a high standard of quality. He holds many FDOT and specialized training certifications.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
South Florida Water Management District L8 Inflow Structure and Pump Station D-B, West Palm Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2011	2016 (est.)??

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Senior project representative and lead inspector. Carollo provided conceptual design of the $64 million L-8 Reservoir Pump Station and Inflow Structure project in the Loxahatchee area in Palm Beach County, Florida. Carollo is also providing provide Owner Advisor Services for the procurement, design, and construction of the project.

b.

(1) TITLE AND LOCATION *(City and State)*
South West Florida Water Management District Lake Hancock Drainage Control Structure/Station, West Palm Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2012	2013

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

CEI project engineer/senior inspector. Responsible for overseeing inspections on a major CIP concrete and steel sheet piling drainage structure controlling all water from Lake Hancock. Duties include overseeing inspections of CIP concrete, duct banks, electrical, mechanical, shop drawings, contractors pay requests, communications equipment, submittal review, and conformance with plans and specifications.

c.

(1) TITLE AND LOCATION *(City and State)*
South Florida Water Management District Everglades Compartment B Project, West Palm Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2010	2012

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Lead electrical inspector. Responsible for overseeing inspections of multiple pump stations in the Florida Everglades Restoration Projects. Duties include overseeing inspections of electrical installations in accordance to approved submittals, plans and specifications. Performing on site QA process of electrical/mechanical equipment layouts, monitor and report any field changes, inspection observations, and deficiencies.

d.

(1) TITLE AND LOCATION *(City and State)*
Plant wide Condition Assessment and Capital Plan for the South Central Regional Wastewater Treatment and Disposal Board's South Central Regional Wastewater Treatment Plant, Delray Beach, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2010	2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Project engineer. The South Central Regional Wastewater Treatment Plant was evaluated to develop a capital expenditure program to meet capacity and R&R needs over the next 20 years. Projects were ranked according to priority and need.

e.

(1) TITLE AND LOCATION *(City and State)*
Office Depot Construction Department, Boca Raton, FL

(2) YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
2006	2008

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[ ] Check if project performed with current firm

Senior project manager. Prepared the planning and scheduling for new store construction and commissioning for regional development teams. Insuring on time delivery for store openings. Daily interfacing and coordination with engineers, architects, and contractors. Successfully achieved the opening of 68 stores in the western U.S. in a 1 ½-year period

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 1

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Evaluation of East Wastewater Treatment Plant Upgrade Using IFAS Technology, Margate, FL	2016	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
City of Margate	Mr. Reddy Chitepu	954-979-1872

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Carollo has completed two assignments to evaluate the application of IFAS for the City of Margate:

1. East Wastewater Treatment Plant (WWTP) Upgrade Using IFAS Technology
2. IFAS Cost Evaluation at the East WWTP

Relevance to Margate

- The following work was conducted on the IFAS study that has led to this project:
  - IFAS evaluation for secondary treatment capacity increase.
  - Hydraulic analysis
  - Electrical and structural analysis
  - Cost estimating

The City owns and operates two parallel wastewater treatment plants (WWTPs) which straddle NW 66th Avenue. The East WWTP is an older 2.2 mgd activated sludge process and the West WWTP is a newer 7.9 mgd rotating biological contactor (RBC) process. The combined treatment capacity of the East and West WWTPs is 10.1 mgd. These plants receive independent influent flows; however, there is some interconnection between the individual plants. The effluent of the East WWTP is conveyed to the West WWTP to undergo disinfection in a facility common to both plants prior to deep well injection. Digestate is also pumped from the East WWTP to the West WWTP to be dewatered within a common solids handling system. The City was interested in further refining the cost and logistics of reducing the load on the RBCs at the West WWTP by increasing the treatment capacity of the East WWTP by converting it to an integrated fixed-film activated sludge (IFAS) process.

The City requested that Carollo provide the preliminary design of the optimal method for implementing IFAS technology at the East WWTP. Items considered in the plant upgrade evaluations were:

- Use of existing equipment
- Increased aeration requirements
- Expected sludge production and digester capacity
- Expected capacity increase
- Construction sequencing
- Project cost

In performing the initial evaluations of alternative technologies for the East WWTP, Carollo used professional judgment to make assumptions regarding certain aspects of the existing facilities. To refine the estimates of the modifications and costs required to upgrade the East WWTP, Carollo conducted detailed analyses and evaluated historic and current documentation related to the existing facility.

As part of the work, Carollo inspected the existing facilities and met with the facility operators to better understand the existing facilities and system operation. The emphasis of the site visit was assessing the condition of the structures and electrical equipment. This allowed a determination of structural needs for installing media retention screens to be connected to the effluent channel, and mounting a fine screen in the influent channel.

The IFAS process will also exert a higher electrical demand on existing equipment and the adequacy of existing electrical equipment to handle the IFAS extra load was evaluated, in addition to assessing the current physical condition of the existing electrical equipment. A Preliminary Design Report was prepared from the evaluation of the received data, site inspections, and workshops.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Hollywood, FL	Prime
b.	Carollo Engineers, Inc.	Winter Park, FL	Engineering Support
c.	Carollo Engineers, Inc.	Phoenix, AZ	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 2

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Stewart Creek WWTP Optimization Study and Facility Plan	2012	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Colony, TX	Mr. Tod Maurina	972-624-3128

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

.

The Stewart Creek Wastewater Treatment Plant is a 3.4-mgd facility owned and operated by the City of The Colony, Texas. The Colony selected Carollo to evaluate the facility's treatment performance and recommend improvements to meet current and future discharge regulations, decrease energy consumption, and improve plant operability. Carollo assisted the Colony with three different studies: a phosphorus removal study, a nitrification optimization study, and a facility plan.

The Colony faced growing environmental concerns and public pressure regarding its wastewater discharge. Permit limits are expected to become more stringent in the net 20 years, making it necessary to address alternatives for future permit limits.

Relevance to Margate

- Evaluated & troubleshooted existing IFAS process (fixed media), and compared to other process alternatives (IFAS with free-floating media, CAS, MBR) for plant expansion.
- Used BioWin/Biotran modeling in the evaluations.

As part of this project, Carollo evaluated and troubleshooted existing IFAS process (fixed media), and compared to other process alternatives (IFAS with free-floating media, CAS, MBR) for plant expansion to 6.1 mgd. Used BioWin/Biotran modeling in the evaluations.
Post-secondary biological aerated filters (BAF) followed by denitrifying filters (DNF) was the recommendation for a total nitrogen limit of 8 mgd/L.

To address capacity issues and discharge requirements, Carollo evaluated treatment alternatives at the Colony's Stewart Creek Wastewater Treatment Plant and recommended improvements.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Denver, CO	Engineering Support
b.			
c.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 3

21. TITLE AND LOCATION *(City and State)*: Miscellaneous IFAS Evaluation Projects

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
See below	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Various clients	Various	

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Relevance to Margate
- IFAS process.

Carollo evaluated IFAS for the following FL projects and projects nationwide:

Utility	Treatment Plant / Project Name	Year	IFAS Component
Margate, FL	East WWTP (4 mgd) – IFAS Cost Evaluation	2016	IFAS was considered to expand the capacity of the existing East WWTP.
Tallahassee	Lake Bradford Road (4.5 mgd) – WRF Improvements	2009	Interim operation alternatives.
Pasco County	Wesley Center WWTF (9 mgd) – WWTP Rehab Expansion	2015	IFAS evaluated as part of Preliminary Design.
Manatee County	Southwest WRF (15 mgd) – Nitrogen Removal Process Mods.	2011	
Orange County Utility Department, FL	SWWRF (15 mgd) – Conceptual Design and Facility Update	2011	Evaluated IFAS as a process alternative. High-level conceptual screening.
Hillsborough County, FL	Northwest Regional WRF (30 mgd) – Strategic Implementation Plan	2013	IFAS was considered for expanding the capacity of the existing plant.
West County Wastewater District, CA	West County Wastewater District WPCP (12.5 mgd) – District-Wide Master Plan	2012	Evaluated IFAS as a process alternative in WRP Master Plan.
City of San Mateo / EMID, CA	San Mateo WWTP (21 mgd) – WWTP Master Plan	2013	Evaluated IFAS as a process alternative in WRP Master Plan.
Sunnyvale, CA	Donald M. Somers WPCP (29.5 mgd) – Master Plan	2015	Evaluated IFAS as a process alternative.
City of Palo Alto, CA	Palo Alto Regional Water Quality Control Plant (39 mgd) – Long Range Facilities Plan	2012	Evaluated IFAS as a process alternative in Facilities Master Plan.
Central Contra Costa Sanitary District, CA	Central Contra Costa Sanitary District Treatment Plant (54 mgd) – WWTP Master Plan	2016	Evaluated as one of the technologies for upgrading the plant to provide nitrification and nitrogen removal.
Manhattan, KS	WWTP BNR (8 mgd) – BNR Expansion and Upgrade Project No. SP075	2009	One of the technologies considered to meet the requirements of the Kansas *Surface Water Nutrient Reduction Plan* to evaluate technologies capable of meeting five tiers of nitrogen and phosphorus removal.
City of the Colony, TX	Stewart Creek WWTP (6.1 mgd) – Nitrification Optimization Study / Stewart Creek WWTP (6.1 mgd) – Facility Exp. Plan	2012	Evaluated and troubleshooted existing IFAS, and compared to other process alternatives.
Austin, TX	Hornsby Bend Biosolids Facility – (0.32 mgd) Sidestream Treatment	2010	Evaluated implementation of IFAS and other process to increase the capacity and performance of a conventional activated sludge facility treating thickening and dewatering filtrate at a centralized solids handling facility.
Bellingham, WA	Post Point WWTP (215 mgd) – WWTP Design	2012	Evaluated IFAS alternative for conversion from HPO plant.
City of Tacoma, WA	Central and North End Treatment Plants (60 and 144 mgd) – Nitrogen Removal Study	2012	Evaluated IFAS as a process alternative for nitrogen removal and capacity upgrade of HPO plant.
King County, WA	South WWTP and West Point WWTP (144 and 215 mgd) – Nitrogen Removal Study	2010 2011	Evaluated IFAS as alternative for nitrogen removal and capacity upgrade of activated sludge plant.
City of San Leandro, CA	San Leandro Water Pollution Control Plant (7.6 mgd) – Plant Rehabilitation	2015	Evaluated IFAS as an alternative treatment technology.
City of Riverside, CA	Riverside WWTP (28 mgd) – Wastewater Collection and Treatment Facilities Integrated Master Plan	2008	Evaluated IFAS as a process alternative for plant expansion to 28 mgd.
City of Lubbock, TX	Southeast Water Reclamation Plant (29.1 mgd) – Solid Stream Studies	2009	Performed plant model including IFAS secondary treatment process.

5. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Winter Park (FL), Sarasota (FL), Denver, (CO)	Prime and Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 4

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Miscellaneous Projects, South Central Reginal Wastewater Treatment and Disposal Board, FL	Ongoing	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
South Central Regional Wastewater Treatment and Disposal Board	Mr. Doug Levine	561-272-7061

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Relevance to Margate

- Plant-wide condition assessment
- Repair and replacement of aging infrastructure
- Capacity improvements
- Electrical improvements
- FPL coordination

Carollo provides as needed engineering for the SCRWWTP. Work provided to date includes:

Plant Wide Condition Assessment: Carollo conducted an assessment of asset condition, criticality, and developed a twenty year forecast for potential repair and replacement (R&R) projects suitable for budgeting and scheduling of staffing and resources. The tasks included:

- Assessment of Existing Treatment Processes: included sizing and design criteria for major assets and processes. Assigned values for original and forecasted useful life.
- Development of an Asset Tree and Classification System. Developed an asset tree to define an asset inventory hierarchy. Developed and documented an asset ID and classification system based on the
- Defined R&R Projects: Aggregated assets to define projects based on the following considerations: 1) major unit process categories and proximity to one another (e.g. preliminary/primary treatment area; primary sludge pumping; primary sedimentation basins; etc.), 2) major equipment type (e.g., pumps, bar screens, etc.), and stand-alone support facilities (e.g. odor control system, electrical system, SCADA, etc.).
- Estimated Project and O&M Costs for R&R Projects. Project costs included estimated construction costs, and all soft costs (planning, engineering, construction management, and legal) to deliver a complete project. For linear assets (i.e., collection and distribution system piping), project costs were based on planning-level unit costs (i.e. $/ft. of installed pipe).
- Developed List of Projects by Cost and Criticality. Used Carollo software to assess information obtained during the on-site condition assessment, including the condition assessment (vulnerability) rankings and remaining useful life. Imported photos for major assets to further document the existing condition of the assets. Documented the answers by O&M staff and engineering specialists. Determined financial valuations for the assets, including acquisition cost, current value, book value, annual and cumulative depreciation, and estimated repair costs. Generated Risk-Ranked R&R Projects.

Assessment of Electrical Supply: The existing reclaimed water facilities receive power from four outdoor pad mounted transformers that stepdown the plant power distribution voltage from 4,160 volts to 480 volts. Their individual output is interconnected to four indoor switchboards. The existing condition of the pad mounted transformers and the configuration of the power distribution system present the following two issues: Three of the existing transformers have been in service since 1998 and their existing condition is decayed due to progressive corrosion, rupture of the transformer's tanks and leaks of the cooling fluid. The loss of the transformer cooling fluid increases the transformer operating temperature and the risk of transformer damage that could impact the reliability of the facility. The transformers were originally designed without overcurrent protection showing a very high level of possible arc flash incident energy, in excess of 80 calories/cm^2. The project included the following:

1. Coordinate with Florida Power and Light (FPL) to evaluate a separate 480 volt electrical service, consisting of two FPL pad mounted transformers. Evaluate the FPL fees and additional incidental construction cost, to meet FPL requirements for the electrical service.
2. Evaluate the cost to modify the existing outdoor 480 volt power feeders, as necessary to interconnect with the FPL transformers.
3. Evaluate the additional cost to include outdoor overcurrent protection on the FPL transformer output feeders, as necessary to reduce the magnitude of possible short circuit current and incident arc flash energy from the FPL service into the existing indoor switchboards.

Design and Construction Management for Bulk Hypochlorite Storage and Feed Facility: Carollo provided design and construction services for a new bulk Sodium Hypochlorite storage and feed system for the reclaimed water area. Design criteria were developed to define the feed dosages and storage volumes. A preliminary design report was prepared defining a process schematic, storage tanks and feed pumps and location of the facilities. The project is currently in detailed design.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Hollywood, FL	Prime
b.	Carollo Engineers, Inc.	Lake Worth, FL	Engineering Support
c.	Carollo Engineers, Inc.	Winter Park, FL	Engineering Support
d.	Carollo Engineers, Inc.	Phoenix, AZ	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 5

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Wesley Center Wastewater Treatment Plant Rehabilitation Expansion, New Port Richey, FL	2016	2018 (est.)

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Pasco County	Mr. Joseph Viciere	813-929-2755 ext. 6978

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

The Pasco County Utilities Branch (PCUB) owns and operates an interconnected system of wastewater treatment plants that treat sewage generated in its service area... Currently, the PCUB operates seven WWTPs the service area and is planning a consolidation program that will reduce the number of WWTPs and will pump sewage to fewer subregional WWTPs. As a result, the Wesley Center WWTP (WCWWTP) will receive a significant share of the sewage generated by the PCUB.

WCWWTP improvements and upgrades will accommodate an expansion to treat future flows and correct deficiencies caused by aging, corrosion, and construction problems. Further consideration of the long-term operating strategies and effluent quality is needed to maximize use of the reuse disposal system.

The WCWWTP is a Type I conventional activated sludge wastewater facility a permitted annual average day flow (AADF) of 6 million gallons per day (mgd) with a total future plant capacity of 9.0 mgd.

Relevance to Margate

- Condition assessment, evaluation, and facilities planning.
- Facility upgrades to replace aging equipment.
- Expansion of existing wastewater facility.
- Performed planning, design, permitting, bidding, and construction services.
- Replaced surface aerators with a fine bubble diffuser system.

PCUB selected Carollo to perform a condition assessment and full facility evaluation to identify and prioritize the improvements to the WCWWTP. Carollo has completed the preliminary evaluation and facility plan for the phased improvements. Carollo is currently working with PCUB to design and construct the first phase of improvements which will increase the facility from 6.0 mgd to 9.0 mgd. The improvements for phase 1 are as follows:

- New Headworks and Odor Control
- Process Improvements to the Existing Biological Train
  - Remove surface aerators and install fine bubble diffusers
  - New blower and blower building for diffuser system
  - New internal recycle pump station
  - Retrofit the existing empty biological basins
- Upgrade the secondary clarifier drives and scum removal/pumping systems
- New chlorine contact tank and effluent transfer pump station
- New filter backwash mudwell and automate backwashing cycle for filters
- Expand the sodium hypochlorite chemical system
- Install new drain pump station
- Upgrade and improve the in-plant water system
- Miscellaneous concrete and structural repair work at the biological basins, filter structures and sludge holding tanks.

The phase 2 improvements will be performed at a later date. The estimated construction cost is $15M.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Orlando, FL	Prime
b.	Carollo Engineers, Inc.	Lake Worth, FL	Engineering Support
c.	Carollo Engineers, Inc.	Hollywood, FL	Engineering Support
d.	Carollo Engineers, Inc.	Dallas, TX	Engineering Support
e.	Carollo Engineers, Inc.	Phoenix, AZ	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 6

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Southwest Water Reclamation Facility Improvements, Bradenton, FL	2011	2018 (est.)

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Manatee County	Mr. Anthony Benitez	941-708-7450, ext. 7333

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

The Southwest Water Reclamation Facility (SWWRF) has a permitted capacity of 15 mgd and experienced significant deterioration. The four secondary clarifier's mechanisms and the headworks equipment were more than 20 years old and beyond their useful life. Much of the equipment and concrete affiliated with the headworks was deteriorated and in need of restoration or replacement. Additionally, the scum ejector equipment for Clarifiers 3 and 4 were older than 20 years and no longer operational. Carollo designed the following:

- Rehabilitated headworks facility, including structural rehabilitation, channel modifications, existing bar screen modifications, new screenings conveyors, and a new grit cyclone and classifier and removal system.
- New clarifier mechanisms and effluent launders for Clarifiers 1 through 4.
- New variable frequency drives for existing RAS Pump Nos. 2, 4, 5, and 6.
- New scum pumping systems for Clarifier 3 and 4.
- New electrical and I&C wiring and conduits to support all new and rehabilitated facilities.

Relevance to Margate

- IFAS was evaluated as a process alternative.
- WRF facility upgrade due to aging equipment.
- New electrical equipment and conduits, and I&C wiring.
- Facility upgrades and improvements.
- Phased implementation to maintain plant operation.
- Services from planning through construction and start-up.
- State, local, and SFWMD permitting.

Carollo designed the project in multiple phases to allow the plant to be in operation while making improvements to the headworks, clarifiers, and other renovated equipment and systems. The replacement of the clarifier's mechanisms, screenings conveyors, and grit classifiers will dramatically improve plant reliability and efficiency. These new scum pumps eliminated the problematic and odorous operation and maintenance issues. New variable frequency drives improve the operational efficiency and prolong the life of the existing pumps.

"They have demonstrated an attention to detail, cost-consciousness, and an overall commitment to the success of the project. They have provided an exceptional level of knowledge and expertise and the proper amount of resources required to ensure a quality product. They have worked especially well with our staff to ensure concerns were addressed and project deadlines achieved."

Jeff Goodwin
Wastewater Division Manager
Manatee County, FL

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Sarasota, FL	Prime
b.	Carollo Engineers, Inc.	Lake Worth, FL	Engineering Support
c.	Carollo Engineers, Inc.	Orlando, FL	Engineering Support
d.	Carollo Engineers, Inc.	Dallas, TX	Engineering Support
e.	Carollo Engineers, Inc.	Phoenix, AZ	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 7

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Central County Water Reclamation Facility Design (Multiple Phases), Sarasota, FL	2004	2012

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Sarasota County	Mr. Greg Rouse	941-861-0548

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Carollo performed a preliminary design study, which included identification of permitting requirements, design basis, site considerations, electrical distribution, I&C, and implementation issues that would be required for a phased expansion to 5.4 mgd (Phase 2) and then 8.0 mgd (Phases 2B and 3).

Phase 2 increased the CCWRF capacity to 5.4 mgd maximum month average daily flow (MMADF). Major electrical modifications were also completed to provide new electrical service, main electrical building, and additional motor control centers (MCCs) to serve future process units for the subsequent expansion to 8 mgd in Phase 3.

During construction of Phase 2, the Phase 3 design documents were completed and included a new 8-mgd MMADF headworks with in-channel perforated plate screens, an additional anoxic basin, new aeration basin, new blower building, two new secondary clarifiers, two new deep-bed filters, a new chlorine contact tank, improvements to the sludge holding facilities and a new operation and maintenance building.

Construction of several key elements of the Phase 3 design commenced in early 2011 including the headworks, blower building, and operation and maintenance building.

Relevance to Margate

- Detailed condition assessments and facility planning.
- Facility upgrades and improvements.
- State, local, and SWFWMD permitting.
- New electrical service, electrical building, and MCCs.
- Services from preliminary design through start-up.
- Capacity increase upgrades.

"Staff members of the County have been extremely pleased with the cost, quality, timeliness, and responsiveness of the professional consulting and engineering services that we have received from Carollo."

Gregory Rouse, PE
Utilities Technical Manager
Sarasota County Public Works, FL

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Sarasota, FL	Prime
b.	Carollo Engineers, Inc.	Hollywood, FL	Engineering Support
c.	Carollo Engineers, Inc.	Winter Park, FL	Engineering Support
d.	Carollo Engineers, Inc.	Phoenix, AZ	Engineering Support
e.	Carollo Engineers, Inc.	Dallas, TX	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 8

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Program Management Wastewater Services, Orlando, FL	2009 (On-going)	2010

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Orange County Utilities	Mr. Larry Tunnell	407-254-9721

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Orange County Utilities (OCU) selected Carollo to perform services at their wastewater plants, including a cloth disk filter evaluation study; studies to reduce nutrients and overall plant optimization; pilot- and full-scale demonstration studies of alternative processes and configurations; energy optimization studies; facility planning for a new 5-mgd WRF and 40-mgd WRF, design for expansion of a 43-mgd WRF; and construction management services (CMS) for an 11-mgd WRF and a 24-mgd WRF. This is a multi-year contract that began in June 2009. Carollo was recently re-selected for another 5-year term with OCU. A summary of the design and CMS are as follows:

- South Reclamation Facility – Master Plan looking at MBR/IFAS. Carollo evaluated IFAS as a process alternative. High-level conceptual screening.
- South Water Reclamation Facility – Phase V Expansion – Design to increase capacity from 43.0 mgd to 56.0 mgd. Design includes additional influent screens and screenings equipment, a grit removal system, converting the former rectangular clarifiers into a step-feed biological nutrient removal (BNR) treatment process, a new 165-foot clarifier, adding more filters, chlorine contact volume, effluent storage, and biosolids thickening units
- Carollo provided Construction Management Services for the 10.25-mgd Phase IIIA Expansion of the North Water Reclamation Facility (NWRF). Major components of the project include a new headworks facility, new BNR basin with diffused aeration, addition of a fifth clarifier, addition of a new tertiary disk filtration system, and expansion of the chlorine contact tank.
- Carollo prepared a study to evaluate various cloth disk filters in side-by-side comparisons. The study involved developing the test plan, managing implementation of disk filter testing, analyzing, and reporting on test results, and making procurement recommendations.

Relevance to Margate

- Facility conditions assessments.
- Planning and design for new secondary clarifiers.
- Capacity increase alternatives including IFAS.
- Cloth disks filter design.
- Planning, design, and program management of major expansions of multiple large water reclamation facilities.
- Services from planning through start-up.

"Carollo's performance on this contract has been excellent. Work was performed on time for the budgeted amount. Carollo's staff is very professional and proactive in meeting the County's needs and provided the highest level of technical expertise."

Larry Tunnell, P.E., PG
Water Reclamation Division Manager
Orange County Utilities, FL

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Winter Park, FL	Prime
b.	Carollo Engineers, Inc.	Sarasota, FL	Engineering Support
c.	Carollo Engineers, Inc.	Phoenix, FL	Engineering Support
d.	Carollo Engineers, Inc.	Dallas, TX	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 9

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Miscellaneous Projects for Hillsborough County Tampa, FL	2010 - Present	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Hillsborough County	Mr. George Cassady	813-272-5977 X43307

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Hillsborough County selected Carollo to perform services at their wastewater plants. Relevant projects include:

Relevance to Margate

- Condition assessment.
- Treatment technology evaluation including IFAS.
- Capacity increase and reliability assessment.
- Permitting.

- **Utility Bond Engineer.** Carollo provides services to support maintenance of assets, optimization of facilities and procedures, and meeting requirements of bond covenants. Specific tasks include:
- **Annual Facilities review.** Annual Operations Review; Annual System Report; Financial Analysis Assistance; Annual Strategic Business Plan Update; Regulatory Compliance Facilitation; Master Planning Efforts.
- **Hillsborough County 12-mgd Valrico Advanced Wastewater Treatment Facility Regulatory Compliance Facilitation.** Carollo evaluated the operating data, treatment processes, equipment, operational and maintenance procedures, and system reliability. From the assessment, a corrective action plan was developed for plant improvements to increase reliability and regulatory compliance.
- **Hillsborough County Northwest WW Master Planning Assistance.** Carollo prepared a fundamental site plan for County property associated with the Northwest WWC Program. In light of the fundamental site plan, Carollo provided an overview and comprehensive overall plan for operational elements associated with the Northwest WWC Program. Based on the site plan and operational elements developed in previous tasks, Carollo assisted the County with fiscal planning and conceptual cost estimates for the Northwest WWC program site master plan.

- **SCADA Master Plan.** Carollo provided professional engineering services to conduct high priority, expedited tasks in support of a SCADA Master Plan. Part I provided tasks that were time sensitive and high priority for the PUD. Carollo identified a range of short-term SCADA alternatives for the existing pump stations, which were not visible via the existing SCADA system. Part two included planning for SCADA improvements, including system needs analysis, communications criteria, backbone network criteria, enterprise data integration and implementation plan.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Winter Park, FL	Prime
b.	Carollo Engineers, Inc.	Hollywood, FL	Engineering Support
c.	Carollo Engineers, Inc.	Sarasota, FL	Engineering Support
d.	Carollo Engineers, Inc.	Phoenix, FL	Engineering Support

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT
(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 10

21. TITLE AND LOCATION *(City and State)*	22. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
Lake Bradford Road WWTF Upgrades Design Tallahassee, FL	2007	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
City of Tallahassee, FL	Mr. Joseph Cheatham	850-891-1009

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Carollo was selected to facility improvements for the LBRWWTF. In general, the existing conventional activated sludge process was to be upgraded to a 4.5-mgd MBR process incorporating a biological nitrogen removal process (BNR) to meet the new nitrogen limits. The LBRWWTF would be operated in a satellite mode to reduce loads on the TPSWRF. Specifically, the following modifications were included in the final design for the upgrades to the LBRWWTF

Relevance to Margate
- Treatment technology evaluation including IFAS
- Capacity increase assessment

- Pretreatment facility (new facility to replace existing; coarse screening, submersible influent pumping, and odor control).
- Primary treatment (existing facility; replace existing piping and equipment).
- Grit removal (new facility, from primary sludge).
- Fine screening (new facility, 2.0 mm openings).
- BNR activated sludge using a four-stage Bardenpho process (sequential aerobic and anoxic zones) with internal mixed liquor recycle pumping between aeration and anoxic zones.
- Membrane filtration (new structure and hollow fiber membrane equipment including chemical cleaning system).
- High-level disinfection (new contact tank; existing hypochlorite system to be relocated).
- Chemical addition (metal salt, methanol; new facilities).
- Reuse storage and high service pumps (new facilities).
- Administration and blower building (new facility, RAS pumps, permeate pumps, scour and process air blowers, offices, laboratory, electrical).
- Electrical building (new facility).

The LBRWRF is situated in a constricted space. Because of the limited space available, and the inability to acquire additional land, special attention had to be given to methods for fitting the new facilities with the available land area.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Carollo Engineers, Inc.	Winter Park, FL	Prime
b.	Carollo Engineers, Inc.	Sarasota, FL	Engineering Support
c.	Carollo Engineers, Inc.	Sarasota, FL	Engineering Support
d.	Carollo Engineers, Inc.	Denver, CO	Engineering Support

G. KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS

26. NAMES OF KEY PERSONNEL (From Section E, Block 12)	27. ROLE IN THIS CONTRACT (From Section E, Block 13)	28. EXAMPLE PROJECTS LISTED IN SECTION F (Fill in "Example Projects Key" section below before completing table. Place "X" under project key number for participation in same or similar role.)									
		1	2	3	4	5	6	7	8	9	10
Randy Braley	Project Manager				■						
Liz Fujikawa	Client Service Manager	■			■						
Erica Stone	Project Engineer	■		■	■				■	■	
Roderick Reardon	Process Engineering / QA/QC	■	■	■	■	■	■		■		■
John Fraser	Process Engineering / QA/QC		■	■							■
Bob Cushing	Process Engineering / QA/QC			■			■	■	■	■	■
Mario Gamboa	Electrical and I&C Engineer	■			■			■		■	
Joel Smason	Structural Engineer	■			■	■	■	■	■	■	■
Chad Green	HVAC				■	■	■	■	■		
Jeff Alband	Architect					■			■		
Angelica Gregory	Permitting				■		■			■	
Terry Storck	Construction Manager										

29. EXAMPLE PROJECTS KEY

NO.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)	NO.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)
1	City of Margate, FL, Evaluation of East Wastewater Treatment Plant Upgrade using IFAS Technology	6	Manatee County, FL, Southwest Water Reclamation Facility Improvements
2	City of Colony, TX, IFAS Evaluation	7	Sarasota County, FL, Central County Water Reclamation Facility Design (Multiple Phases)
3	Various Locations, Miscellaneous IFAS Evaluation Projects	8	Orange County Utilities, FL, Program Management Wastewater Service
4	South Central Regional Wastewater Treatment and Disposal Board, FL, Miscellaneous Projects	9	Hillsborough County, FL, Miscellaneous Projects
5	Pasco County, FL, Wesley Center Wastewater Treatment Plant Rehabilitation Expansion	10	City of Tallahassee, FL, Lake Bradford Road WWTF Upgrades Design

H. ADDITIONAL INFORMATION

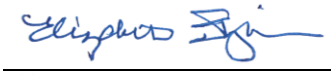
30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH ADDITIONAL SHEETS AS NEEDED.

See Cover Letter, Firm/Team Org Chart, Firm Description, Key Staffing, and Project Management.

I. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

31. SIGNATURE



32. DATE

7/5/2017

33. NAME AND TITLE

Elizabeth Fujikawa, Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	4. DUNS NUMBER
Carollo Engineers, Inc.	2009	045809316

2b. STREET	5. OWNERSHIP
3440 Hollywood Boulevard, Suite 465	a. TYPE: Corporation
2c. CITY: Hollywood / 2d. STATE: FL / 2e. ZIP CODE: 33021	b. SMALL BUSINESS STATUS: No
6a. POINT OF CONTACT NAME AND TITLE: Charles Sinclair, P.E. - Senior Vice President	7. NAME OF FIRM *(If block 2a is a branch office)*
6b. TELEPHONE NUMBER: 954-837-0030 / 6c. E-MAIL ADDRESS: csinclair@carollo.com	

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	0
06	Architects	5	0
10	Chemical Engineers	4	0
12	Civil Engineers	212	1
	Computer Personnel	29	0
	Construction Engineers	7	0
15	Construction Inspectors	29	0
16	Construction Managers	21	0
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	1
21	Electrical Engineers	42	1
23	Environmental Engineers	250	2
29	Geographic Information System	2	0
	Instrumentation/Control	38	0
	Marketing	43	0
42	Mechanical Engineers	22	0
52	Sanitary Engineers	0	0
57	Structural Engineers	37	0
	Word Processing	23	0
	Other Employees	65	0
	Total	1,031	5

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	7
P04	Pipelines (Cross-country--Liquid & Gas)	9
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	10
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE

b. DATE: July 10, 2017

c. NAME AND TITLE

Charles Sinclair, P.E. - Senior Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	5. DUNS NUMBER
Carollo Engineers, Inc.	2009	045809316

2b. STREET	2c. CITY	2d. STATE	2e. ZIP CODE
9897 Lake Worth Road, Suite 302	Lake Worth	FL	33467

5. OWNERSHIP

a. TYPE: Corporation

b. SMALL BUSINESS STATUS: No

6a. POINT OF CONTACT NAME AND TITLE	6b. TELEPHONE NUMBER	6c. E-MAIL ADDRESS
Lyle Munce, P.E. - Vice President	561-868-6400	lmunce@carollo.com

7. NAME OF FIRM *(If block 2a is a branch office)*

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	1
06	Architects	5	0
10	Chemical Engineers	4	0
12	Civil Engineers	212	4
	Computer Personnel	29	0
	Construction Engineers	7	0
15	Construction Inspectors	29	3
16	Construction Managers	21	0
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	0
21	Electrical Engineers	42	0
23	Environmental Engineers	250	3
29	Geographic Information System	2	0
	Instrumentation/Control	38	0
	Marketing	43	0
42	Mechanical Engineers	22	0
52	Sanitary Engineers	0	0
57	Structural Engineers	37	0
	Word Processing	23	0
	Other Employees	65	0
	Total	1,031	11

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	7
P04	Pipelines (Cross-country--Liquid & Gas)	9
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	10
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE: Lyle Munce

c. DATE: July 10, 2017

c. NAME AND TITLE: Lyle Munce, P.E. - Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	6. DUNS NUMBER
Carollo Engineers, Inc.	2008	045809316

2b. STREET	2d. STATE	2e. ZIP CODE
200 East Robinson Street, Suite 1400		
2c. CITY		
Orlando	FL	32801

5. OWNERSHIP

a. TYPE: Corporation

b. SMALL BUSINESS STATUS: No

6a. POINT OF CONTACT NAME AND TITLE	
Larry Elliott, P.E. - Senior Vice President	
6b. TELEPHONE NUMBER	**6c. E-MAIL ADDRESS**
407-478-4642	lelliott@carollo.com

7. NAME OF FIRM *(If block 2a is a branch office)*

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	0
06	Architects	5	0
10	Chemical Engineers	4	0
12	Civil Engineers	212	3
	Computer Personnel	29	0
	Construction Engineers	7	0
15	Construction Inspectors	29	0
16	Construction Managers	21	1
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	0
21	Electrical Engineers	42	0
23	Environmental Engineers	250	11
29	Geographic Information System	2	0
	Instrumentation/Control	38	0
	Marketing	43	0
42	Mechanical Engineers	22	0
52	Sanitary Engineers	0	0
57	Structural Engineers	37	0
	Word Processing	23	0
	Other Employees	65	0
	Total	1,031	15

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	10
P04	Pipelines (Cross-country--Liquid & Gas)	7
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	9
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

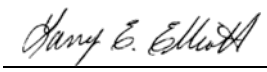
PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE



d. DATE: July 10, 2017

c. NAME AND TITLE

Larry Elliott, P.E. - Senior Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	7. DUNS NUMBER
Carollo Engineers, Inc.	2001	045809316

2b. STREET	2c. CITY	2d. STATE	2e. ZIP CODE
401 North Cattlemen Road, Suite 306	Sarasota	FL	34232

6a. POINT OF CONTACT NAME AND TITLE	6b. TELEPHONE NUMBER	6c. E-MAIL ADDRESS
Dean Milton, P.E. - Associate Vice President	941-371-9832	dmilton@carollo.com

5. OWNERSHIP

a. TYPE: Corporation

b. SMALL BUSINESS STATUS: No

7. NAME OF FIRM *(If block 2a is a branch office)*:

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	1
06	Architects	5	0
10	Chemical Engineers	4	0
12	Civil Engineers	212	5
	Computer Personnel	29	0
	Construction Engineers	7	0
15	Construction Inspectors	29	0
16	Construction Managers	21	0
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	3
21	Electrical Engineers	42	0
23	Environmental Engineers	250	3
29	Geographic Information System	2	0
	Instrumentation/Control	38	0
	Marketing	43	0
42	Mechanical Engineers	22	0
52	Sanitary Engineers	0	0
57	Structural Engineers	37	0
	Word Processing	23	0
	Other Employees	65	0
	Total	1,031	12

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	10
P04	Pipelines (Cross-country--Liquid & Gas)	7
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	9
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE

e. DATE: July 10, 2017

c. NAME AND TITLE: Dean Milton, P.E. - Associate Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	8. DUNS NUMBER
Carollo Engineers, Inc.	1998	045809316

2b. STREET	5. OWNERSHIP
Signature Place II, 14785 Preston Road, Suite 950	a. TYPE: Corporation
2c. CITY: Dallas / 2d. STATE: TX / 2e. ZIP CODE: 75254	b. SMALL BUSINESS STATUS: No
6a. POINT OF CONTACT NAME AND TITLE: Steve Frost, P.E. - Associate Vice President	7. NAME OF FIRM *(If block 2a is a branch office)*
6b. TELEPHONE NUMBER: 972-239-9949 / 6c. E-MAIL ADDRESS: sfrost@carollo.com	

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	4
06	Architects	5	0
10	Chemical Engineers	4	1
12	Civil Engineers	212	13
	Computer Personnel	29	0
	Construction Engineers	7	0
15	Construction Inspectors	29	0
16	Construction Managers	21	0
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	0
21	Electrical Engineers	42	1
23	Environmental Engineers	250	10
29	Geographic Information System	2	0
	Instrumentation/Control	38	2
	Marketing	43	0
42	Mechanical Engineers	22	5
52	Sanitary Engineers	0	0
57	Structural Engineers	37	5
	Word Processing	23	0
	Other Employees	65	0
	Total	1,031	41

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	7
P04	Pipelines (Cross-country--Liquid & Gas)	9
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	10
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

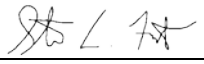
PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE



f. DATE: July 10, 2017

c. NAME AND TITLE: Steve Frost, P.E. - Associate Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	9. DUNS NUMBER
Carollo Engineers, Inc.	1996	045809316

2b. STREET	5. OWNERSHIP
390 Interlocken Crescent, Suite 800	a. TYPE: Corporation
2c. CITY: Broomfield; 2d. STATE: CO; 2e. ZIP CODE: 80021	b. SMALL BUSINESS STATUS: No
6a. POINT OF CONTACT NAME AND TITLE: Becky Luna, P.E. - Vice President	7. NAME OF FIRM *(If block 2a is a branch office)*
6b. TELEPHONE NUMBER: 303-635-1220; 6c. E-MAIL ADDRESS: bluna@carollo.com	

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	2
06	Architects	5	0
10	Chemical Engineers	4	0
12	Civil Engineers	212	8
	Computer Personnel	29	1
	Construction Engineers	7	3
15	Construction Inspectors	29	2
16	Construction Managers	21	2
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	8
21	Electrical Engineers	42	0
23	Environmental Engineers	250	11
29	Geographic Information System	2	0
	Instrumentation/Control	38	0
	Marketing	43	2
42	Mechanical Engineers	22	1
52	Sanitary Engineers	0	0
57	Structural Engineers	37	9
	Word Processing	23	1
	Other Employees	65	2
	Total	1,031	52

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	7
P04	Pipelines (Cross-country--Liquid & Gas)	9
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	10
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

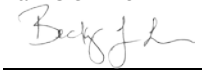
PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE



g. DATE: July 10, 2017

c. NAME AND TITLE: Becky Luna, P.E. - Vice President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: 2017-017

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME	3. YEAR ESTABLISHED	10. DUNS NUMBER
Carollo Engineers, Inc.	1933	045809316

2b. STREET	2c. CITY	2d. STATE	2e. ZIP CODE
4600 East Washington Street, Suite 500	Phoenix	AZ	85034

6a. POINT OF CONTACT NAME AND TITLE	6b. TELEPHONE NUMBER	6c. E-MAIL ADDRESS
Lisa Freestone, P.E. - Vice President	602-263-9500	lfreestone@carollo.com

5. OWNERSHIP

a. TYPE: Corporation

b. SMALL BUSINESS STATUS: No

7. NAME OF FIRM *(If block 2a is a branch office)*

8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED	8c. DUNS NUMBER
Carollo Engineers, P.C.	1998	045809316

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	(2) BRANCH
02	Administrative	88	43
06	Architects	5	4
10	Chemical Engineers	4	2
12	Civil Engineers	212	18
	Computer Personnel	29	10
	Construction Engineers	7	0
15	Construction Inspectors	29	2
16	Construction Managers	21	2
17	Corrosion Engineer	0	0
18	Cost Engineer/Estimator	0	0
	Draftsperson	114	15
21	Electrical Engineers	42	7
23	Environmental Engineers	250	32
29	Geographic Information System	2	0
	Instrumentation/Control	38	2
	Marketing	43	4
42	Mechanical Engineers	22	7
52	Sanitary Engineers	0	0
57	Structural Engineers	37	5
	Word Processing	23	4
	Other Employees	65	11
	Total	1,031	168

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
A12	Automation; Controls; Instrumentation	7
C15	Construction Management	8
C17	Corrosion Control; Cathodic Protection;	2
E03	Electrical Studies and Design	7
P04	Pipelines (Cross-country--Liquid & Gas)	9
P06	Planning (Site, Installation and Project)	9
S04	Sewage Collection, Treatment & Disposal	10
W03	Water Supply; Treatment and Distribution	10

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	2
b. Non-Federal Work	10
c. Total Work	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE

h. DATE: July 10, 2017

c. NAME AND TITLE: Lisa Freestone, P.E. - Vice President

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Daniel Davila, PE	Site Engineer	18	6

15. FIRM NAME AND LOCATION *(City and State)*
Chen Moore and Associates, Fort Lauderdale, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor of Science / Civil Engineering	FL / Professional Engineer

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*
Mr. Davila has over 18 years of civil engineering experience. His experience includes water and wastewater facilities, facilities planning, utilities master planning, infrastructure renewal, construction management and rate and financial studies. Mr. Davila has assisted numerous clients that range from municipalities, counties, federal agencies, healthcare districts, residential developers and commercial developers to educational institutions.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
BC-Potable Water Storage Tanks and Pumping Systems Fort Lauderdale, Florida	2017	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — **[X]** Check if project performed with current firm

Project Manager. Chen Moore and Associates (CMA) is a subconsultant to Carollo Engineers on a project for Broward County relating to remote potable water storage and pumping. As part of the scope, Chen Moore is the lead planner, providing services for Site Plan and DRC approval for the site. Fee: $ 42,246 (total)

b.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
BC-Potable Water Storage Tanks - Ph II & III Fort Lauderdale, Florida	2017	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — **[X]** Check if project performed with current firm

Project Manager. Chen Moore and Associates is a subconsultant to Carollo Engineers on a project for Broward County relating to remote potable water storage and pumping. CMA is the civil engineer, site planner and landscape architect for the 1.5 million gallon potable water storage tank located in Broward County Facility 3A in Dania Beach. Fee: $ 623,163 (total)

c.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
TOD SW 58th Ave Water Main Davie, FL	2017	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — **[X]** Check if project performed with current firm

Project Manager. CMA is the lead engineer for the SW 58th Street watermain extension for the Town of Davie Utilities Department. Improvements include approximately 3,500 linear feet of 8" PVC C-900 pipe with tees and stub-outs for future connections. The watermain is located in a residential area and as part of the design CMA will coordinate phasing of the construction to maintain traffic access to residential areas. Fee: $29,781

d.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
Broward County UAZ 110/111 & 113 Water Sewer Improvements 113B Lauderdale Lakes, FL	2017	2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — **[X]** Check if project performed with current firm

Engineer. The Water and Sanitary Sewer Improvements for the UAZ 110/111 & 113 Project will include the improvements to the existing water distribution system, sanitary sewer system, and transmission systems within the project area along with the restoration of surface areas disturbed for the construction of said improvements. The existing system being replaced consists of approximately 168,100LF of water mains, 122,100 LF of sanitary sewer mains and 23,600 LF force main. Fee$ 3,544,729

e.

(1) TITLE AND LOCATION *(City and State)*	(2) YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If Applicable)*
BARC & SATC Civil & Landscape Dev Project Ft Lauderdale, FL	2016	2016

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — **[X]** Check if project performed with current firm

Project Manager. Chen Moore and Associates, as a subconsultant to Saltz Michelson, is providing professional services for the site civil and landscape architecture design for the development of the Broward Addiction Recovery Center (BARC) and the Nancy J Cotterman Center (NJCC) buildings. The building is being designed to meet LEED Gold certifications. Fee: $ 77,885

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Cristobal Betancourt, RLA	Landscape Architect	22	6

15. FIRM NAME AND LOCATION *(City and State)*
West Palm Beach, FL

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor of Science / Landscape Architecture	FL / Registered Landscape Architect

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Mr. Betancourt is Chen Moore and Associates' Director of Landscape Architecture and Planning. He has experience providing planning and landscape architecture design solutions for public and private sector clients. Mr. Betancourt provides a full range of services starting with due diligence and master planning culminating in detailed site design. He is well versed in the use of low-impact development techniques applied to site planning.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*
BC-Potable Water Storage Tanks and Pumping Systems
Fort Lauderdale, Florida

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2017 — CONSTRUCTION *(If Applicable)*: 2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Landscape architect. Chen Moore and Associates (CMA) is a subconsultant to Carollo Engineers on a project for Broward County relating to remote potable water storage and pumping. As part of the scope, Chen Moore is the lead planner, providing services for Site Plan and DRC approval for the site. Fee: $ 42,246 (total)

b.

(1) TITLE AND LOCATION *(City and State)*
BC-Potable Water Storage Tanks - Ph II & III
Fort Lauderdale, Florida

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2017 — CONSTRUCTION *(If Applicable)*: 2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Landscape architect. Chen Moore and Associates is a subconsultant to Carollo Engineers on a project for Broward County relating to remote potable water storage and pumping. CMA is the civil engineer, site planner and landscape architect for the 1.5 million gallon potable water storage tank located in Broward County Facility 3A in Dania Beach. Fee: $ 623,163 (total)

c.

(1) TITLE AND LOCATION *(City and State)*
BC-Central Campus Irrigation Study
Davie, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2015 — CONSTRUCTION *(If Applicable)*: N/A

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project Manager. Chen Moore and Associates was contracted by Broward College to develop an Irrigation Master Plan for its Central Campus located in Davie, Florida. The Campus is approximately 87 Acres and contains 3 separate points of connection for their irrigation system including wells and surface water. The system has grown incrementally through time and has not been developed with long term growth in mind. CMA has developed a 5 year capital improvement and master plan for the system to correct existing deficiencies and plan for the future growth of the campus. Fee: $33,330

d.

(1) TITLE AND LOCATION *(City and State)*
Margate Dog Park
Margate, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2016 — CONSTRUCTION *(If Applicable)*: 2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Landscape architect. CMA is providing professional design services for the Margate Dog Park Project. The proposed dog park site is located along the east side of Rock Island Road south of NW 18th Street within the existing FPL Easement, which is approximately 300 wide. CMA's scope of services includes conceptual plan development; public workshops with the homeowners association and City commission; topographic survey; subsurface utility verification; geotechnical investigation; document research/review; civil engineering design; landscape/irrigation design; regulatory and surface water permitting; bid document preparation; bidding coordination; and bid review. Fee: $ 53,870

e.

(1) TITLE AND LOCATION *(City and State)*
Coconut Creek Fire Station 50
Coconut Creek, FL

(2) YEAR COMPLETED — PROFESSIONAL SERVICES: 2016 — CONSTRUCTION *(If Applicable)*: 2017

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE

[X] Check if project performed with current firm

Project Manager. Chen Moore and Associates provided landscape architecture services as a subconsultant to CPZ Architects for Fire Station 50 to be located at the intersection of Coconut Creek Parkway and 45th Avenue in the City of Coconut Creek, Florida. The proposed program for the project includes the design, permitting and construction of a two story, approximately 13,000 square foot municipal fire station. The project is seeking LEED silver certification through the USGBC. Fee: $ 14,250

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 1

21. TITLE AND LOCATION *(City and State)*
BC-Potable Water Storage Tanks - 3A sites
Fort Lauderdale, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2017	2017

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Broward County	Jeffrey Greenfield	954.831.0923

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA is the civil engineer, site planner and landscape architect for the 1.5 million gallon potable water storage tank located in Broward County Facility 3A in Dania Beach. As part of the scope, Chen Moore is the lead planner, providing services for Site Plan and DRC approval for the site. In addition, Chen Moore is providing yard piping design for the 24", 20" and 14" supply lines that feed and interconnect the proposed tank and proposed High Service Pump Station. The scope also includes design of water and sewer services including a lift station to serve the new Pump Building. Chen Moore is also providing the design for the stormwater management for the site.

Fee: $ 623,163 (total)

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 2

21. TITLE AND LOCATION *(City and State)*
BC-Potable Water Storage Tanks - Facility 1B1
Fort Lauderdale, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2017	2017

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Broward County	Jeffrey Greenfield	954.831.0923

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA is the civil engineer, site planner and landscape architect for the 1.5 million gallon potable water storage tank located in Broward County Facility 1B1 in Fort Lauderdale. As part of the scope, Chen Moore is the lead planner, providing services for Site Plan and DRC approval for the site. In addition, Chen Moore is providing yard piping design for the 24", 20" and 14" supply lines that feed and interconnect the proposed tank and proposed High Service Pump Station. The scope also includes design of water and sewer services including a lift station to serve the new Pump Building. Chen Moore is also providing the design for the stormwater management for the site.

Fee: $ 623,163 (total)

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 3

21. TITLE AND LOCATION *(City and State)*
Task 2 - District 2A Design-Site 2A
Fort Lauderdale, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2016	2016

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Broward County	Jeffrey Greenfield	954.831.0923

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Chen Moore was subconstant to Carollo Engineers to provide site civil engineering services for the design of a new 5-million gallon potable water tank to be constructed in the Broward County Water Treatment Plant 2A facility in the City of Pompano Beach. As part of the project Chen Moore provided demolition plans for the existing water tanks and provided the design of yard piping connecting the proposed tank to the existing high service pump station and the existing tank. The yard piping entailed design of 42", 48" and 54" diameter pipes. The design also required the re-routing of a 6" forcemain to make room for the new 5-million gallon tank. In addition, the project required the design of a stormwater management system for the new facility. The system required regrading of the site and delineating drainage basins. It also entailed design of dry retention areas and culverts.

Fee: $ 65,401

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 4

21. TITLE AND LOCATION *(City and State)*
UV System Civic Design
W Palm Beach, FL

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2015	2015

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
City of West Palm Beach	Vivek Galav	561.494.1061

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA is assisting MWH with UV improvements for the City of West Palm Beach Water Treatment Plant. The City of West Palm Beach will be implementing UV Light Disinfection Treatment at their Water Treatment Plant. The improvements will consist of the UV treatment system, a new transfer pump station, a new PAC treatment system, and refurbishment of the existing gravity filters. Chen Moore and Associates has been requested to provide civil engineering services relating to these improvements associated with paving, grading and drainage.

The scope of work includes:

- Demolition of existing roadway and drainage facilities in conflict with the proposed design
- Continuation of access road between existing filters and existing pump station
- Fill and grading where underground storage tank is to be removed
- Drainage to accommodate the new UV building
- Drainage to address flooding issues by existing Ammonia building
- Extend shoreline of Clear Lake approximately 20', including shoreline stabilization, in the vicinity of the Ammonia building
- Roadway grading and parking improvements from the existing filters to the northernmost side of the existing parking lot at the Administration Building
- Parking and roadway improvements on east side of the site between the existing diesel tanks and Chemical building
- Mill and resurface of remaining access road not included in item above
- Overflow from new transfer pump station to Clear Lake that can withstand 50 MGD

Fee: $ 61,276

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 5

21. TITLE AND LOCATION *(City and State)*
Boca Chica/NAS Key West Pump Station & FM Extension
Boca Chica, FL

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2015	2015

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Florida Keys Aqueduct Authority	Ray Shimokubo	305.295.2160

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

The Florida Keys Aqueduct Authority (FKAA) has agreed to connect the existing WWTP located on Navy property at Mile Marker 7 on US Highway 1 (Boca Chica, Florida) to the FKAA WWTP at Big Coppitt just north of Mile Marker 8. The existing facility at the Navy property does not meet AWT standards per a recent FKAA report, therefore the proposed connection would require that the Big Coppitt WWTP be expanded to provide 200,000 gpd capacity as required by the agreement between FKAA and the federal government.

FKAA has asked CMA to prepare a proposal for the civil engineering and related services (geotechnical, electrical, surveying and subsurface engineering) to model and design the proposed pump station at the existing Navy property to connect the station to the FKAA wastewater collection system and then size and propose a force main along the existing Navy road and a portion of Overseas Highway (US Highway 1) near the Boca Chica WWTP. Services shall include modeling, designs with submittals at the 50%, 75% and 90% stages, site meetings, government permitting, and bidding assistance.

Fee: $ 241,490

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Prime
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 6

21. TITLE AND LOCATION *(City and State)*
Force Main Modeling and Design
Margate, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2015	2015

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Carollo Engineers	Thomas Gillogly	954.837.0030

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA, as a subconsultant to Carollo Engineers, was contracted by the City of Margate to perform modeling, design and permitting for force main improvements. The modeling is based on the previous models that CMA completed for the City and will evaluate two different options for connecting existing force mains. These connections will allow the City to direct the flow to their other wastewater treatment plant. In addition to the modeling, the project includes the design and permitting of over 2,600 LF of new force main and abandonment of over 1,000 LF of existing force main. The new force main design incorporates a directional drill under a City-owned canal.

Fee: $ 100,239

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 7

21. TITLE AND LOCATION *(City and State)*
Broward County North Regional Wastewater Treatment Plant
Atlas Prep
Broward County, FL

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2012	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Hazen and Sawyer (client)	Janeen Wietgrefe	954.987.0066

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Chen Moore and Associates was contracted by Hazen and Sawyer to prepare an updated atlas for the Broward County North Regional Wastewater Treatment Plant. This project included reviewing and verifying existing paper as-built drawings for all processes within the treatment plant and creating a comprehensive as-built drawing in AutoCAD format as well as a schematic of the plants systems.

The process included geo-referencing as-built, utilization of subsurface utility engineering (SUE) soft-digs to locate the precise locations of the existing utilities and then correcting the final drawings. The resultant product is the most accurate representation of subsurface utilities ever presented for the NRWWTP, assisting in future design and construction decisions. Additionally, the individual process diagrams were updated and reprinted for ease of the Plant Operators.

Fee: $284,124

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 8

21. TITLE AND LOCATION *(City and State)*
Hydraulic Wastewater Model-Updates & Analysis
Margate, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2016	2016

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
City of Margate	Eric Leveque	305.261.2484

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA is assisting the City of Margate with an update of the lift stations and force main information in the existing hydraulic wastewater model and further evaluation of the system to determine feasibility of the proposed force main along Southgate Boulevard to provide system redundancy. The scope of services includes updating the hydraulic model; calibrating the model and creating an additional scenario for evaluation; determining feasibility of the proposed force main along Southgate Boulevard during average and wet weather event conditions; and providing a technical memorandum report summarizing the latest model updates and results of the system evaluation.

Fee: $ 8,515

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 9

21. TITLE AND LOCATION *(City and State)*
Palm Beach County WTP 8 Raw Water Bypass
Lake Worth, FL

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2011	N/A

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Palm Beach County	Ali Bayat	561.493.6128

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

Chen Moore and Associates was a subconsultant to Carollo Engineers for the design and permitting of a 12" raw water bypass at a Palm Beach County water treatment plant. Design duties included coordination with valve manufacturers for specialized product information, pipe sizing with hydraulic analysis, pressure analysis, detailed design of pipeline including above ground concrete supports and cost estimates. Permits were obtained through the Palm Beach County Health Department and were approved with the first submittal. Chen Moore and Associates will also be performing construction inspections.

Fee: $ 6,930

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, If not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY NUMBER: 10

21. TITLE AND LOCATION *(City and State)*: Southgate Boulevard & Rock Island Force Main, Margate, Florida

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if Applicable)
2016	2016

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
City of Margate	Eric Leveque	305.261.2484

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(Include scope, size, and cost)*

CMA is assisting Carollo Engineers with installing approximately 6,000 linear feet of sanitary sewer force main to provide system redundancy. CMA is responsible for the survey, geotechnical engineering, subsurface utility investigation, design, permitting and bidding assistance. The firm is also providing hydraulic modeling services to verify the impacts to other areas of the sewer transmission system with the implementation of the new force main.

Fee: $ 177,041

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION *(City and State)*	(3) ROLE
a.	Chen Moore and Associates	Fort Lauderdale, FL	Subconsultant
b.			
c.			
d.			
e.			
f.			

G. KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS

26. NAMES OF KEY PERSONNEL (From Section E, Block 12)	27. ROLE IN THIS CONTRACT (From Section E, Block 13)	28. EXAMPLE PROJECTS LISTED IN SECTION F (Fill in "Example Projects Key" section below before completing table. Place "X" under project key number for participation in same or similar role.)									
		1	2	3	4	5	6	7	8	9	10
Daniel Davila, PE	Engineer	X		X							
Cristobal Betancourt, RLA	Landscape Architect	X									

29. EXAMPLE PROJECTS KEY

NO.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)	NO.	TITLE OF EXAMPLE PROJECT (FROM SECTION F)
1	Broward County, FL, Potable Water Storage Tanks - 3A sites	6	City of Margate, FL, Force Main Modeling and Design
2	Broward County, FL, Potable Water Storage Tanks - Facility 1B1	7	Broward County, FL, North Regional Wastewater Treatment Plant Atlas Prep
3	Broward County, FL, Task 2 - District 2A Design-Site 2A	8	City of Margate, FL, Hydraulic Wastewater Model-Updates & Analysis
4	City of West Palm Beach, FL, UV System Civic Design	9	Palm Beach County, FL, WTP 8 Raw Water Bypass
5	Florida Keys Aqueduct Authority, FL, Key West Pump Station & FM Extension	10	City of Margate, FL, Southgate Boulevard & Rock Island Force Main

H. ADDITIONAL INFORMATION

30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH ADDITIONAL SHEETS AS NEEDED.

Chen Moore and Associates (CMA) is a multi-discipline consulting firm with offices in Broward, Miami-Dade, Palm Beach, Orange and Alachua Counties. Founded in 1986, Chen Moore and Associates specializes in civil and environmental engineering, landscape architecture, planning, GIS analysis and mapping, and construction engineering inspection. We are a Florida state and locally certified small business enterprise firm. Dr. Chen founded CMA believing that relationships are critical to planning, designing and constructing successful projects. The firm commits to providing responsive quality services while meeting the schedules and specific project needs of our clients.

CMA actively supports various community organizations including Habitat for Humanity, Toys for Tots, the Cooperative Feeding Program, and Ocean Watch, a non-profit group focused on cleaning and preserving South Florida's Beaches. Firm staff participates in local professional society events including the American Society of Civil Engineers, Florida Engineering Society, American Society of Landscape Architects, Irrigation Association, Florida Recreation and Park Association, International Society of Arboriculture and the United States Green Building Council. We proudly support our industry and the communities in which we live, play and work.

Our services include the following:

- Infrastructure Master Planning
- Pump Station Design and Rehabilitation
- Water Supply, Treatment and Distribution Design
- Stormwater Management System Design and Master Plans
- Environmental Engineering
- Roadway Design and Streetscape
- Traffic Calming Design
- Circulation & Roundabout Design
- Government Permitting
- Land Development
- Site Development
- Site Planning
- Landscape Architecture
- Hardscape Design
- Irrigation Design
- Park Design
- Greenway & Trails Design
- Pedestrian & Bicycle Pathway Design
- Habitat Restoration
- Wayfinding
- GIS Analysis and Mapping
- Project and Program Management
- Sustainable Design and LEED Solutions
- Value Engineering
- Utility Rate and Infrastructure Valuation Studies
- Resident Coordination and Stakeholder Meetings

I. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

31. SIGNATURE	32. DATE
	6/27/2017

33. NAME AND TITLE
Peter Moore, P.E., LEED AP, F.ASCE, President

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(IF ANY)*: RFQ 2017-017

PART II –GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME: **Chen Moore and Associates**	3. YEAR ESTABLISHED: 2011
	4. DUNS NUMBER: 859459547
2b. STREET: 500 W. Cypress Creek Rd., Suite 630	5. OWNERSHIP
	a. TYPE: Corporation
2c. CITY: Fort Lauderdale	2d. STATE: FL
2e. ZIP CODE: 33309	b. SMALL BUSINESS STATUS: **Small Business**
6a. POINT OF CONTACT NAME AND TITLE: **Peter Moore, PE, LEED AP, F.ASCE, President and CEO**	7. NAME OF FIRM *(If block 2a is a branch office)*
6b. TELEPHONE NUMBER: (954) 730-0707, ext 1002	6c. E-MAIL ADDRESS: pmoore@chenmoore.com
8a. FORMER FIRM NAME(S) *(if any)*: Chen and Associate Consulting Engineers, Inc.	8b. YEAR ESTABLISHED: 1986
	8c. DUNS NUMBER: 859459547

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) Firm	(2) Branch
02	Administrative	7	5
08	CADD Technician	31	10
12	Civil Engineer	12	5
15	Construction Inspector	3	2
16	Construction Manager	2	1
39	Landscape Architect	2	0
	Total	57	23

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 Y EARS

a. Profile Code	b. Experience	c. Revenue Index No. *(see below)*
C10	Commercial Building; (low rise); Shopping Centers	1
C15	Construction Management	1
C18	Cost Estimating; Cost Engineering and Analysis; Parametric Costing; Forecasting	2
E02	Education Facilities; Classrooms	2
E09	Environmental Impact Studies, Assessments or Statements	1
G04	GIS development, analysis, data	2
H07	Highways; Streets; Airfield; Parking	2
L03	Landscape Architecture	1
P05	Planning (Community, Regional)	2
P06	Planning (Site, Installation)	2
P13	Public Safety Facilities	2
R04	Recreation Facilities (Parks, etc.)	2
R06	Rehab. (Buildings, Structures)	3
R11	Rivers Canals; Waterways; Flood Control	1
S04	Sewage Collection & Treatment	4
S11	Sustainable Design	1
S13	Stormwater Handling & Facilities	4
T02	Testing & Inspection Services	4
T03	Traffic & Transportation	2
V01	Value Analysis; Life-Cycle Costing	1
W03	Water Supply, Treatment, Distrib.	4

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	1
b. Non-Federal Work	6
c. Total Work	6

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE

b. DATE: 6/27/2017

c. NAME AND TITLE: Peter Moore, PE, LEED AP, F.ASCE, President and CEO

carollo

Engineers...Working Wonders With Water®