FIRST AMENDMENT

No. 12459

THIS IS A FIRST AMENDMENT to the Agreement for Professional/Consulting Services No. 2015 dated _____, between:

CITY OF POMPANO BEACH, a municipal corporation of the State of Florida, whose address is 100 West Atlantic Boulevard, Pompano Beach, Florida 33060, hereinafter referred to as "CITY",

and

CAROLLO ENGINEERS, INC., a Delaware corporation authorized to do business in Florida, having its office and place of business at 2795 Mitchell Drive, Walnut Creek, California 94598, hereinafter referred to as "CONSULTANT."

WHEREAS, the parties entered into Agreement for Professional/Consulting Services No. 2015 for an electical master plan update and design for the City's Water Treatment Plant 5KV Electrical System on July 13, 2023, ("Original Agreement"), and approved by City Resolution No. 2023-194; and

WHEREAS, the Original Agreement provided for an extension up to one (1) year upon mutual agreement by the CITY and CONSULTANT; and

WHEREAS, the CITY and CONSULTANT have mutually agreed to extend the Original Agreement for one (1) additional one-year period.

W I T N E S S E T H :

IN CONSIDERATION of the mutual terms, conditions, promises, covenants and payments herein set forth CITY and CONSULTANT agree as follows:

1. Each “WHEREAS” clause set forth above is true and correct and herein incorporated by this reference.

2. The Original Agreement No. 2015 effective July 13, 2023, approved and adopted by Resolution No. 2023-194, a copy of which is attached hereto and made a part hereof as Exhibit "A," shall remain in full force and effect for the new contract extension term except as specifically amended herein below.

3. The parties hereto agree to extend the Original Agreement No. 2015 for one (1) additional one-year period, ending July 12, 2025 under the same terms and conditions.

4. This Agreement shall bind the parties and their respective executors, administrators, successors and assigns and shall be fully effective as though the extension had been originally included in the Agreement.

THE REMAINDER OF THE PAGE IS INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year hereinabove written.

Attest:

CITY OF POMPANO BEACH

_____
KERVIN ALFRED, CITY CLERK

By:_____
REX HARDIN, MAYOR

(SEAL)

By:_____
GREGORY P. HARRISON, CITY MANAGER

APPROVED AS TO FORM:

_____
MARK E. BERMAN, CITY ATTORNEY

"CONSULTANT"

Carollo Engineers, Inc.

Witnesses:

By: Laura Baumberger
Laura Baumberger, Senior Vice President

Kristiana Pragash
(Print or Type Name)

Scott Richards
(Print or Type Name)

STATE OF Florida

COUNTY OF Sarasota

The foregoing instrument was acknowledged before me, by means of ☑ physical presence or ☐ online notarization, this 17th day of July, 2024, by Laura Baumberger as Senior Vice President of Carollo Engineers, Inc., a Delaware corporation on behalf of the corporation. She is personally known to me or who has produced _____ (type of identification) as identification.

NOTARY'S SEAL:

MICHELLE RYAN
Notary Public - State of Florida
Commission # HH 334778
My Comm. Expires Dec 11, 2026

Michelle Ryan
NOTARY PUBLIC, STATE OF Florida

Michelle Ryan Michelle Ryan
(Name of Acknowledger Typed, Printed or Stamped)

HH 334778
Commission Number

CERTIFICATE OF LIABILITY INSURANCE

7/4/2025 | DATE (MM/DD/YYYY) 07/01/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Lockton Companies 444 W. 47th Street, Suite 900 Kansas City MO 64112-1906 (816) 960-9000 kcasu@lockton.com	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS:
INSURED 1472602 CAROLLO ENGINEERS, INC. 2795 MITCHELL DR. WALNUT CREEK CA 94598-1601	INSURER(S) AFFORDING COVERAGE / NAIC # INSURER A : Zurich American Insurance Company 16535 INSURER B : Allied World Surplus Lines Insurance Company 24319 INSURER C : INSURER D : INSURER E : INSURER F :

COVERAGES **CERTIFICATE NUMBER:** 16521093 **REVISION NUMBER:** XXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY [X] PRO-JECT [ ] LOC OTHER:	Y	N	GLO 9730569	07/04/2024	07/04/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 2,000,000 $ 2,000,000 $ 25,000 $ 2,000,000 $ 4,000,000 $ 4,000,000 $
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY	Y	Y	BAP 9730571	07/04/2024	07/04/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) DED: COMP/COLL	$ 2,000,000 $ XXXXXXX $ XXXXXXX $ XXXXXXX 1,000
	[ ] UMBRELLA LIAB [ ] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			NOT APPLICABLE			EACH OCCURRENCE AGGREGATE $	$ XXXXXXX $ XXXXXXX $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [N] (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	N	WC 9730570	07/04/2024	07/04/2025	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
B	PROFESSIONAL LIABILITY FULL PRIOR ACTS	N	N	0313-9010	07/04/2024	07/04/2025	EACH CLAIM: $2,000,000; AGGREGATE: $2,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: H-51-10 CONTINUING CONTRACT FOR ENGINEERING SERVICES FOR WATER AND RECLAIMED WATER TREATMENT PLANT PROJECTS CAROLLO PROJECT #: TBD. CITY OF POMPANO BEACH IS AN ADDITIONAL INSURED AS RESPECTS GENERAL LIABILITY, AS REQUIRED BY WRITTEN CONTRACT.

APPROVED DavidDaley
By David Daley at 3:34 pm, Jul 16, 2024

CERTIFICATE HOLDER

16521093
CITY OF POMPANO BEACH
1205 NE 5TH AVENUE
POMPANO BEACH FL 33060

CANCELLATION See Attachments

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Lauren Arnello

POLICY NUMBER: 0313-9010

ENDORSEMENT

NOTICE OF CANCELLATION TO DESIGNATED ENTITY(IES)

Policy No.	0313-9010
Issued to	Carollo Engineers, Inc.
Issued by	Allied World Surplus Lines Insurance Company

In consideration of the premium charged, it is hereby agreed that Section VIII. CONDITIONS, Subsection H. is amended to include the following:

In the event of cancellation or non-renewal of this Policy, the **Company** will provide a thirty-day notice to the entity with whom the **Named Insured** has agreed, pursuant to a prior written contract, to provide to such entity with a notice of cancellation or non-renewal. Provided, however, that in the event of cancellation for non-payment of premium, the **Company** shall provide to such entity a ten-day notice of cancellation before the effective date of cancellation.

In addition, in the event of a reduction in the Limits of Liability of this Policy not resulting from payment of **Damages** or **Defense Expenses**, the **Company** will provide a sixty-day notice to the entity with whom the **Named Insured** has agreed with, pursuant to a prior written contract, to provide such entity with a notice of such reduction in limits.

As a condition precedent to providing the notices specified above, the **Named Insured** will provide the **Company**, within ten (10) business days of the **Company's** request, the names and addresses of the entities with whom the **Named Insured** agreed to provide the notices specified above. In the event the **Named Insured** omits or fails to provide the foregoing information, the **Company** shall not provide such notices.

The **Company's** failure to provide such notices will not extend the Policy cancellation date, negate cancellation, non-renewal or reduction in limits, of this Policy. Nor shall such failure be cause for legal action against the **Company**.

All other terms, conditions and limitations of this Policy shall remain unchanged.

Attachment Code : D573121 Certificate ID : 16521093
POLICY NUMBER: BAP 9730571

Notification to Others of Cancellation, Nonrenewal or Reduction of Insurance

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial Automobile Coverage Part

A. If we cancel or non-renew this Coverage Part by written notice to the first Named Insured for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal:

1. To the name and address corresponding to each person or organization shown in the Schedule below; and

2. At least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to the first Named Insured, or the longer number of days notice if indicated in the Schedule below.

B. If we cancel this Coverage Part by written notice to the first Named Insured for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.

C. If coverage afforded by this Coverage Part is reduced or restricted, except for any reduction of Limits of Insurance due to payment of claims, we will mail or deliver notice of such reduction or restriction:

1. To the name and address corresponding to each person or organization shown in the Schedule below; and

2. At least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.

D. If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE	
Name and Address of Other Person(s) / Organization(s):	**Number of Days Notice:**
All certificate holders where notice of cancellation is required by written contract with the Named Insured	**60**

All other terms and conditions of this policy remain unchanged.

POLICY NUMBER: GLO 9730569

Notification to Others of Cancellation, Nonrenewal or Reduction of Insurance

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial General Liability Coverage Part
Liquor Liability Coverage Part
Products/Completed Operations Liability Coverage Part

A. If we cancel or non-renew this Coverage Part(s) by written notice to the first Named Insured for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal:

1. To the name and address corresponding to each person or organization shown in the Schedule below; and
2. At least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to the first Named Insured, or the longer number of days notice if indicated in the Schedule below.

B. If we cancel this Coverage Part(s) by written notice to the first Named Insured for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.

C. If coverage afforded by this Coverage Part(s) is reduced or restricted, except for any reduction of Limits of Insurance due to payment of claims, we will mail or deliver notice of such reduction or restriction:

1. To the name and address corresponding to each person or organization shown in the Schedule below; and
2. At least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.

D. If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE	
Name and Address of Other Person(s) / Organization(s):	**Number of Days Notice:**
All certificate holders where notice of cancellation is required by written contract with the Named Insured	**60**

All other terms and conditions of this policy remain unchanged.

NOTIFICATION TO OTHERS OF CANCELLATION, NONRENEWAL OR REDUCTION OF INSURANCE ENDORSEMENT

This endorsement is used to add the following to Part Six of the policy.

PART SIX
CONDITIONS

A. If we cancel or non-renew this policy by written notice to you for any reason other than nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation or non-renewal to the name and address corresponding to each person or organization shown in the Schedule below. Notification to such person or organization will be provided at least 10 days prior to the effective date of the cancellation or non-renewal, as advised in our notice to you, or the longer number of days notice if indicated in the Schedule below.

B. If we cancel this policy by written notice to you for nonpayment of premium, we will mail or deliver a copy of such written notice of cancellation to the name and address corresponding to each person or organization shown in the Schedule below at least 10 days prior to the effective date of such cancellation.

C. If coverage afforded by this policy is reduced or restricted, except for any reduction of Limits of Liability due to payment of claims, we will mail or deliver notice of such reduction or restriction to the name and address corresponding to each person or organization shown in the Schedule below. Notification to such person or organization will be provided at least 10 days prior to the effective date of the reduction or restriction, or the longer number of days notice if indicated in the Schedule below.

D. If notice as described in Paragraphs **A.**, **B.** or **C.** of this endorsement is mailed, proof of mailing will be sufficient proof of such notice.

SCHEDULE	
Name and Address of Other Person(s) / Organization(s):	**Number of Days Notice:**
All certificate holders where notice of cancellation is required by written contract with the Named Insured	**60**

All other terms and conditions of this policy remain unchanged.

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.
(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Policy No. WC 9730570

Insured CAROLLO ENGINEERS, INC.

Insurance Company Zurich American Insurance Company

POLICY NUMBER: GLO 9730569

COMMERCIAL GENERAL LIABILITY
CG 20 37 12 19

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)	Location And Description Of Completed Operations
Any person or organization, other than an architect, engineer or surveyor, whom you are required to add as an additional insured under this policy under a written contract mark or written agreement executed prior to loss.	Any Location or project, other than a wrap-up or other consolidated insurance program location or project for which insurance is otherwise separately provided to you by a wrap-up or other consolidated insurance program
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the Schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

However:

1. The insurance afforded to such additional insured only applies to the extent permitted by law; and

2. If coverage provided to the additional insured is required by a contract or agreement, the insurance afforded to such additional insured will not be broader than that which you are required by the contract or agreement to provide for such additional insured.

B. With respect to the insurance afforded to these additional insureds, the following is added to **Section III – Limits Of Insurance:**

If coverage provided to the additional insured is required by a contract or agreement, the most we will pay on behalf of the additional insured is the amount of insurance:

1. Required by the contract or agreement; or

2. Available under the applicable Limits of Insurance;

whichever is less.

This endorsement shall not increase the applicable Limits of Insurance.

POLICY NUMBER: GLO 9730569

Other Insurance Amendment - Primary and Non-Contributory

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the:

Commercial General Liability Coverage Part

1. The following paragraph is added to the Other Insurance Condition of Section **IV – Commercial General Liability Conditions**:

   This insurance is primary insurance to and will not seek contribution from any other insurance available to an additional insured under this policy provided that:

   a. The additional insured is a Named Insured under such other insurance; and

   b. You are required by a written contract or written agreement that this insurance would be primary and would not seek contribution from any other insurance available to the additional insured.

2. The following paragraph is added to Paragraph **4.b.** of the Other Insurance Condition of Section **IV – Commercial General Liability Conditions**:

   This insurance is excess over:

   Any of the other insurance, whether primary, excess, contingent or on any other basis, available to an additional insured, in which the additional insured on our policy is also covered as an additional insured on another policy providing coverage for the same "occurrence", offense, claim or "suit". This provision does not apply to any policy in which the additional insured is a Named Insured on such other policy and where our policy is required by written contract or written agreement to provide coverage to the additional insured on a primary and non-contributory basis.

All other terms and conditions of this policy remain unchanged.

POLICY NUMBER: BAP 9730571

COMMERCIAL AUTO
CA 20 48 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED INSURED FOR COVERED AUTOS LIABILITY COVERAGE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

This endorsement identifies person(s) or organization(s) who are "insureds" for Covered Autos Liability Coverage under the Who Is An Insured provision of the Coverage Form. This endorsement does not alter coverage provided in the Coverage Form.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

SCHEDULE

Name Of Person(s) Or Organization(s):
Any person or organization to whom or which you are required to provide additional insured status or additional insured status on a primary, non-contributory basis, in a written contract or written agreement executed prior to loss, except where such contract or agreement is prohibited by law.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

Each person or organization shown in the Schedule is an "insured" for Covered Autos Liability Coverage, but only to the extent that person or organization qualifies as an "insured" under the Who Is An Insured provision contained in Paragraph **A.1.** of Section **II** – Covered Autos Liability Coverage in the Business Auto and Motor Carrier Coverage Forms and Paragraph **D.2.** of Section **I** – Covered Autos Coverages of the Auto Dealers Coverage Form.

POLICY NUMBER
BAP 9730571

COMMERCIAL AUTO
CA 04 44 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US (WAIVER OF SUBROGATION)

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

Named Insured:	Zurich American Insurance Company
Endorsement Effective Date:	07/04/2024

SCHEDULE

Name(s) Of Person(s) Or Organization(s):
Any person or organization you are required to waive your rights of recovery in a written contract, agreement or permit with the named insured.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The **Transfer Of Rights Of Recovery Against Others To Us** condition does not apply to the person(s) or organization(s) shown in the Schedule, but only to the extent that subrogation is waived prior to the "accident" or the "loss" under a contract with that person or organization.

RESOLUTION NO. 2023- 194

CITY OF POMPANO BEACH
Broward County, Florida

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF POMPANO BEACH, FLORIDA, APPROVING AND AUTHORIZING THE PROPER CITY OFFICIALS TO EXECUTE AN AGREEMENT FOR PROFESSIONAL/CONSULTING SERVICES BETWEEN THE CITY OF POMPANO BEACH AND CAROLLO ENGINEERS, INC. TO PROVIDE PROFESSIONAL CONSULTING SERVICES FOR AN ELECTRICAL MASTER PLAN UPDATE AND DESIGN FOR THE CITY'S WATER TREATMENT PLANT 5KV ELECTRICAL SYSTEM; PROVIDING AN EFFECTIVE DATE.

BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF POMPANO BEACH, FLORIDA:

SECTION 1. That an Agreement (No. 2015) between the City of Pompano Beach and Carollo Engineers, Inc., relating to the electrical master plan update and design for the city's Water Treatment Plant 5kV Electrical System, a copy of which agreement is attached hereto and incorporated herein by reference as if set forth in full, is hereby approved.

SECTION 2. That the proper City officials are hereby authorized to execute said agreement between the City of Pompano Beach and Carollo Engineers, Inc.

SECTION 3. This Resolution shall become effective upon passage.

PASSED AND ADOPTED this 11th day of July, 2023.

DocuSigned by:
Rex Hardin
502CB780EB3F480...

REX HARDIN, MAYOR

ATTEST:

DocuSigned by:
Kervin Alfred
D1C913A8ED334CA...

KERVIN ALFRED, CITY CLERK

DocuSigned by:

MEB/jrm
7/5/23
l:reso/2023-202

AGREEMENT FOR PROFESSIONAL/CONSULTING SERVICES
No. 2015

THIS PROFESSIONAL/CONSULTING SERVICES AGREEMENT is made and entered into on July 13, 2023, by the City of Pompano Beach, a Florida municipal corporation ("City") and Carollo Engineers, Inc., a Delaware Corporation ("Consultant"), collectively referred to as "the Parties."

WHEREAS, City advertised RFQ E-04-20 in January 14, 2020, requesting firms to submit qualifications and experience for consideration to provide professional consulting services to the City for the a master plan update and design for the City's Water Treatment Plant 5 kV Electrical System ("Project");

WHEREAS, City desires to retain Consultant to provide professional engineering consulting and related services, which Consultant is capable of providing under the terms and conditions described in this Agreement.

NOW, THEREFORE, in consideration of those mutual promises and the terms and conditions set forth bereafter, the parties agree as follows:

1. *Contract Documents*. This Agreement consists of the Scope of Work ("Exhibit A"), the Insurance Requirements ("Exhibit "B"), and E-04-20 and the Consultant's Response ("Exhibit C"), all of which are attached and made a part of this Agreement. It is further agreed that no modification, amendment or alteration in the terms or conditions shall be effective unless contained in a written document executed with the same formality and off equal dignity as this Agreement. None of the provisions, terms and conditions contained in this Agreement may be added to, modified, superseded or otherwise altered, except by written instrument executed by the parties in accordance with Paragraph 24, Waiver and Modification. In the event of any conflict or inconsistency between this Agreement and the provisions in the incorporated Exhibits, resolution shall be attained by giving precedence in the following order: (i) this Agreement, (ii) Exhibit "A", and (iii) Exhibit "C".

2. *Scope of Work*. Consultant shall provide the services set forth in Exhibit "A", including all necessary, incidental and related activities required for full and complete performance of this Agreement ("Scope of Work"). This Agreement does not delineate every detail and minor work task required to be performed by Consultant to complete the Project. During the course of the Services included in this Agreement, if Consultant determines that work should be performed to complete the Project and, in Consultant's opinion, that work is outside the level of effort originally anticipated, whether or not the Scope of Work identifies the work items, Consultant shall notify the City's Contract Administrator in writing in a timely manner before proceeding with the Work. If Consultant proceeds with such work without notifying the City's Contract Administrator, the Work shall be deemed to be within the original level of effort, whether or not specifically addressed in the Scope of Work. Notice to City's Contract Administrator does not constitute authorization or approval by City to Consultant to perform the Work. Performance of

work by Consultant outside the originally anticipated level of effort without prior written City approval shall be at no additional cost to City.

3. City shall assist Consultant by placing at Consultant's disposal all information City has available pertinent to the Project, at no charge, including previous reports and any other data relative to design or construction of the Project. City shall arrange for access to, and make all provision for, Consultant to enter upon public and private property as required for Consultant to perform its Services. City shall review any itemized deliverables and documents required to be submitted by Consultant and respond in writing with any comments within the time set forth in Exhibit A. City shall give prompt written notice to Consultant whenever City observes or otherwise becomes aware of any material defect in the work of the Consultant or other material development that affects the scope or timing of Consultant's Services.

A. Consultant agrees to meet with City at reasonable times after reasonable notice.

B. Consultant acknowledges that it is aware of all the duties and responsibilities and agrees to perform such duties and responsibilities in a professional manner.

C. Notwithstanding any other remedy otherwise available to City, where the work product of Consultant is found to be deficient for the purpose for which it was produced, Consultant shall correct the deficiency at no cost to City.

D. Consultant shall pay its subconsultants, subcontractors and suppliers consistent with Chapter 218, Florida Statutes.

4. *Term.* The term of this Agreement shall begin upon complete execution by all Parties and shall end on the first (1st) anniversary of that date, provided that either party shall have the right to terminate this Agreement as set forth below.

5. *Extension.* In the event City determines Consultant to be in full compliance with this Agreement and Consultant's performance to be satisfactory, the City Contract Administrator, with City Commission approval, may extend the term of this Agreement for a one (1) year term beyond the term established above. The exercise of this option shall be by written notification issued by the City Contract Administrator and furnished to Consultant not less than sixty (60) days prior to the termination date of this Agreement.

6. *Maximum Obligation.* City agrees to pay Consultant as compensation for performance of all services as related to the Scope of Work as required under the terms of this Agreement, including salary costs and reimbursables. It is understood that the method of compensation is that of "maximum amount not-to-exceed" which means that Consultant shall perform all services set forth for total compensation in the amount of or less than that agreed to by City and Consultant for the Project.

7. *Price Formula, Payment and Invoices.*

A. Price Formula. City agrees to pay Consultant for performance of the Work set forth in this Agreement as follows:

Services and reimbursable expenses shall not exceed one million five hundred ninety thousand nine hundred and forty-one dollars 00/100 ($1,590,941.00).

B. Payment. Consultant shall submit invoices to City in accordance to the fee schedule for each task under Exhibit "A", on a monthly basis, based on the progress of each task. All payments by City shall be made after the Work or task described in the Invoice has been verified as completed. Unless disputed by City as provided below, following City's receipt of a Proper Invoice as defined in §218.72, Florida Statutes, as amended, City shall forward Consultant payment for services as defined under Exhibit "A" Compensation. The City shall not be liable for any reimbursable expenses that have not been approved in advance, in writing, by City's Contract Administrator.

C. City may temporarily remove for review any disputed amount, by line item, from an invoice and shall timely provide Consultant written notification of any such disputed charge. Consultant shall provide clarification and a satisfactory explanation to City, along with revised copies of all such documents if inaccuracies or errors are discovered, within ten (10) days of receipt of City's notice of the disputed amount.

D. In the event City has a claim against Consultant for Work performed pursuant to this Agreement, which has not been timely remedied in accordance with the provisions of this Paragraph, City may withhold payment for the contested amount, in whole or in part, to protect itself from loss on account of defective Work, claims filed or reasonable evidence indicating probable filing of claims by other parties against Consultant, or Consultant's failure to make proper payments to subcontractors or vendors for material or labor. When the reason(s) for withholding payment are removed or resolved in a manner satisfactory to City, payment shall be made.

E. Resolution of improper payment requests or invoices shall be in accordance with §218.76, Florida Statutes, as amended.

8. *Disputes*. Any factual disputes between City and the Consultant in regard to this Agreement shall be directed to the City Manager for the City, and such decision shall be final.

9. *Contract Administrators, Notices and Demands*.

A. *Contract Administrators*. During the term of this Agreement, the City's Contract Administrator shall be Randolph Brown and the Consultant's Contract Administrator shall be (or their authorized written designee) as further identified below.

B. *Notices and Demands*. A notice, demand, or other communication hereunder by either party to the other shall be effective if it is in writing and sent via email, facsimile, registered or certified mail, postage prepaid to the representatives named below or is addressed and delivered to such other authorized representative at the address as that party, from time to time may designate in writing and forward to the other as provided herein.

If to Consultant:	Elizabeth Fujikawa 2795 Mitchell Drive Walnut Creek, CA 94598
Office:	Phone: 561-868-6400 Email: efujikawa@carollo.com
If to City:	Randolph Brown, Contract Administrator 100 West Atlantic Blvd Pompano Beach, FL 33060 Office: 954-545-7044 Email: Randolph.Brown@copbfl.com
With a copy to:	Antonio Pucci, Contract Manager 100 West Atlantic Blvd. Pompano Beach, FL 33060 Phone: (954) 786-5574 Email: antonio.pucci@copbfl.com
With a copy to:	Mark Berman, City Attorney 100 West Atlantic Blvd. Pompano Beach, FL 33060 Phone: (954) 786-4614 Email: mark.berman@copbfl.com

10. *Ownership of Documents and Information.* All information, data, reports, plans, procedures or other proprietary rights in all Work products, developed, prepared, assembled or compiled by Consultant as required for the Work described in this Agreement, whether complete or unfinished, shall be owned by the City without restriction, reservation or limitation of their use and made available at any time and at no cost to City upon reasonable written request for its use or distribution as City deems appropriate, provided City has compensated Consultant for such Work product. City's re-use of Consultant's Work product shall be at its sole discretion and risk if done without Consultant's written permission. Upon completion of all Work or termination of this Agreement, copies of all of the above documents shall be promptly delivered to the City's Contract Administrator upon written request. The Consultant may not disclose, use, license or sell any work developed, created, or otherwise originated pursuant to this Agreement to any third party whatsoever. The rights and obligations created under this Paragraph shall survive the termination or expiration of this Agreement.

11. *Termination.*

A. City shall have the right to terminate this Agreement, in whole or in part, for cause by the Consultant, if the Consultant has not corrected the breach within ten (10) calendar days after written notice to Consultant identifying the breach. If the City erroneously, improperly or unjustifiably terminates for cause, such termination shall be deemed a termination for convenience, which shall be effective thirty (30) days after such notice of termination for cause is provided.

B. Termination for convenience shall be effective on the termination date stated in written notice provided by the City, which termination date shall he not less than thirty (30) days after the date of such written notice.

C. This Agreement may also be terminated by the City upon such notice as the City Manager deems appropriate under the circumstances in the event that the City Manager determines that termination is necessary to protect the public health or safety.

D. The Notice of Termination may include City's proposed Transition Plan and timeline for terminating the Work, requests for certain Work product documents and materials, and other provisions regarding winding down concerns and activities.

E. If there is any material breach or default in Consultant's performance of any covenant or obligation in this Agreement which has not been remedied within ten (10) business days after City's written Notice of Termination, City, in its sole discretion, may terminate this Agreement immediately and Consultant shall not be entitled to receive further payment for services rendered from the effective date of the Notice of Termination.

F. In the event of termination, City shall compensate Consultant for all authorized Work satisfactorily performed through the termination date under the payment terms set forth in Paragraph 7 above and all Work product documents and materials shall be delivered to City within ten (10) business days from the Notice of Termination. If any Work is in progress but not completed as of the date of the termination, then upon City's written approval, this Agreement may be extended until such Work is completed and accepted by City.

12. *Force Majeure.* Neither party shall be obligated to perform any duty, requirement or obligation hereunder if such performance is prevented by fire, hurricane, earthquake, explosion, war, civil disorder, sabotage, accident, flood, acts of nature or by any reason of any other matter or condition beyond the control of either party which cannot be overcome by reasonable diligence and without unusual expense ("Force Majeure"). In no event shall economic bardship or lack of funds be considered an event of Force Majeure. If either party is unable to perform or delayed in their performance of any obligations hereunder by reason of any event of Force Majeure, such inability or delay shall be excused at any time during which compliance therewith is prevented by such event and during such period thereafter as may be reasonably necessary for either party to correct the adverse effect of such event of Force Majeure.

Contractor must follow all Federal, State, County, and City safety guidelines, including all CDC safety guidelines in effect during the term of the program, including but not limited to social distancing, and personal protection equipment. Inability to conduct the program and follow any and all required safety guidelines applicable to the COVID-19 virus or other similar pandemic or emergency, or failure to follow such requirements, including but not limited to, social distancing, shall constitute grounds for immediate cancellation of this Agreement unilaterally by the City upon written notice, which may be provided via electronic mail.

13. *Insurance*. Consultant shall maintain insurance in accordance with Exhibit "B" throughout the term of this Agreement.

14. *Indemnification*. Except as expressly provided in this Agreement, no liability shall attach to the City by reason of entering into this Agreement.

A. Consultant shall at all times indemnify, defend, save and hold harmless the City, its officials, officers, employees, volunteers and other authorized agents from and against any and all claims, demands, suit, damages, attorneys' fees, fines, losses, penalties, defense costs or liabilities suffered by the City to the extent caused, during the Consultant's performance under this Agreement, including but not limited to, by any negligent act, omission, breach, recklessness or misconduct of Consultant or any of its agents, officers, or employees, including any inaccuracy in or breach of any of the representations, warranties or covenants made by the Consultant, its agents, officers and employees, in the performance of services of this contract. To the extent considered necessary by City, any sums due Consultant pursuant to this Agreement may be retained by City until all of City's claims for indemnification have been settled or otherwise resolved, and any amount withheld shall not be subject to payment or interest by City.

B. Consultant acknowledges and agrees that City would not enter into this Contract without this indemnification of City by Consultant. The parties agree that one percent (1%) of the total compensation paid to Consultant pursuant to this Agreement shall constitute specific consideration to Consultant for the indemnification provided under this Paragraph and these provisions shall survive expiration or early termination of this Agreement.

15. *Sovereign Immunity*. Nothing in this Agreement shall constitute a waiver by the City of its sovereign immunity limits as set forth in section 768.28, Florida Statutes. Nothing herein shall be construed as consent from either party to be sued by third parties.

16. *Non-Assignability and Subcontracting*.

A. Non-Assignability. This Agreement is not assignable and Consultant agrees it shall not assign or otherwise transfer any of its interests, rights or obligations in this Agreement, in whole or in part, to any other person or entity without City's prior written consent, which must be sought in writing not less than fifteen (15) days prior to the date of any proposed assignment. Any attempt by Consultant to assign or transfer any of its rights or obligations in this Agreement without first obtaining City's written approval shall not be binding on City and, at City's sole discretion, may result in City's immediate termination of this Agreement, at which time, City shall be released of any of its obligations under this Agreement. In addition, this Agreement and the rights and obligations in this Agreement shall not be assignable or transferable by any process or proceeding in court, or by judgment, execution, proceedings in insolvency, bankruptcy or receivership. In the event of Consultant's insolvency or bankruptcy, City may, at its option, terminate and cancel this Agreement without any notice of any kind whatsoever, in which event all rights of Consultant under this Agreement shall immediately cease and terminate.

B. Subcontracting. Prior to subcontracting for Work to be performed pursuant to this Agreement, Consultant shall be required to obtain the written approval of the City's Contract Administrator. If the City's Contract Administrator, in their sole discretion, objects to the

proposed subcontractor, Consultant shall be prohibited from allowing that subcontractor to provide any Work pursuant to this Agreement. Even if the Consultant is permitted to subcontract Work in accordance with this Paragraph, Consultant shall remain responsible for any and all contractual obligations and shall also be responsible to ensure that none of its proposed subcontractors are listed on the *Convicted Vendors List* referenced in accordance with the provisions of Paragraph 28 below.

17. *Performance Under Law.* The Consultant, in the performance of duties under the Agreement, agrees to comply with all applicable local, state and federal laws and ordinances including, but not limited to, standards of licensing, conduct of business and those relating to criminal activity.

18. *Audit and Inspection Records.* The Consultant shall permit the authorized representatives of the City to inspect and audit all data and records of the Consultant, if any, relating to performance under the contract until the expiration of three (3) years after final payment under this contract.

The Consultant further agrees to include in all its subcontracts arising from this Agreement a provision to the effect that the subcontractor agrees that City or any of their duly authorized representatives shall, until the expiration of three (3) years after final payment under the subcontractor, have access to and the right to examine any directly pertinent books, documents, papers and records of such subcontractor, involving transactions related to the subcontractor.

19. *Adherence to Law.* The Consultant shall adhere to all applicable laws governing its relationship with its employees including, but not limited to, laws, rules, regulations and policies concerning worker's compensation, unemployment compensation and minimum wage requirements.

20. *Independent Consultant.* The Consultant shall be deemed an independent Consultant for all purposes, and the employees of the Consultant or any of its Consultants, subcontractors and the employees, shall not in any manner be deemed to be employees of City. As such, the employees of the Consultant, its Consultants or subcontractors, shall not be subject to any withholding for tax, social security or other purposes by City, nor shall such Consultant, subcontractor or employee be entitled to sick leave, pension benefits, vacation, medical benefits, life insurance, workers or unemployment compensation or the like from City.

21. *Mutual cooperation.* The Consultant recognizes that the performance of the Scope of Work pursuant to this Agreement is essential to the provision of vital public services and the accomplishment of the stated goals and mission of City. Therefore, the Consultant shall be responsible to maintain a cooperative and good faith attitude in all relations with City and shall actively foster a public image of mutual benefit to both parties. The Consultant shall not make any statements or take any actions detrimental to the City's effort.

22. *Public Records.*

A. The City of Pompano Beach is a public agency subject to Chapter 119, Florida Statutes. The Consultant shall comply with Florida's Public Records Law, as amended. Specifically, the Consultant shall:

1. Keep and maintain public records required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Agreement's term and following completion of the Agreement if the Consultant does not transfer the records to the City.

4. Upon completion of the contract, transfer, at no cost to the City, all public records in possession of the Consultant, or keep and maintain public records required by the City to perform the service. If the Consultant transfers all public records to the City upon completion of the contract, the Consultant shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Consultant keeps and maintains public records upon completion of the contract, the Consultant shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records in a format that is compatible with the information technology systems of the City.

B. Failure of the Consultant to provide the above described public records to the City within a reasonable time may subject Consultant to penalties under §119.10, Florida Statutes, as amended.

PUBLIC RECORDS CUSTODIAN

IF THE CONSULTANT HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

CITY CLERK
100 W. Atlantic Blvd., Suite 253
Pompano Beach, Florida 33060

(954) 786-4611
RecordsCustodian@copbfl.com

23. *Governing Law; Venue; Waiver of Jury Trial.* This Agreement has been and shall be construed as having been made and delivered within the State of Florida, and it is agreed by the Parties that this Agreement shall be governed by the laws of the State of Florida, both as to interpretation and performance. Any action at law, or in equity, shall be instituted and maintained only in courts of competent jurisdiction in Broward County, Florida. This Agreement and its terms, conditions and requirements comply with §287.055, Florida Statutes. **BY ENTERING INTO THIS AGREEMENT, CONSULTANT AND CITY EXPRESSLY WAIVE ANY RIGHTS EITHER PARTY MAY HAVE TO A TRIAL BY JURY OF ANY CIVIL LITIGATION RELATED TO THIS AGREEMENT. IF A PARTY FAILS TO WITHDRAW A REQUEST FOR A JURY TRIAL IN A LAWSUIT ARISING OUT OF THIS AGREEMENT AFTER WRITTEN NOTICE BY THE OTHER PARTY OF VIOLATION OF THIS SECTION, THE PARTY MAKING THE REQUEST FOR JURY TRIAL SHALL BE LIABLE FOR THE REASONABLE ATTORNEYS' FEES AND COSTS OF THE OTHER PARTY IN CONTESTING THE REQUEST FOR JURY TRIAL, AND SUCH AMOUNTS SHALL BE AWARDED BY THE COURT IN ADJUDICATING THE MOTION.**

24. *Waiver and Modification.*

A. No waiver made by either party with respect to performance, manner, time, or any obligation of either party or any condition in this Agreement shall be considered a waiver of that party's rights with respect to the particular obligation or condition beyond those expressly waived in writing or a waiver of any other rights of the party making the waiver or any other obligations of the other party.

B. No Waiver by Delay. The City shall have the right to institute such actions or proceedings as it may deem desirable for effectuating the purposes of this Agreement provided that any delay by City in asserting its rights in this Agreement shall not operate as a waiver of such rights or limit them in any way. The intent of this provision is that City shall not be constrained to exercise such remedy at a time when it may still hope to otherwise resolve the problems created by the default or risk nor shall any waiver made by City with respect to any specific default by Consultant be considered a waiver of City's rights with respect to that default or any other default by Consultant.

C. Either party may request changes to modify certain provisions of this Agreement; however, unless otherwise provided for in this Agreement, any such changes must be contained in a written amendment executed by both parties with the same formality of this Agreement.

25. *No Contingent Fee.* Consultant warrants that other than a bona fide employee working solely for Consultant, Consultant has not employed or retained any person or entity, or paid or agreed to pay any person or entity, any fee, commission, gift or any other consideration to solicit or secure this Agreement or contingent upon or resulting from the award or making of this Agreement. In the event of Consultant's breach or violation of this provision, City shall have the

right to terminate this Agreement without liability and, at City's sole discretion, to deduct from the Price Formula set forth in Paragraph 7 or otherwise recover the full amount of such fee, commission, gift or other consideration.

26. *Attorneys' Fees and Costs.* In the event of any litigation involving the provisions of this Agreement, both parties agree that the prevailing party in such litigation shall be entitled to recover from the non-prevailing party reasonable attorney and paraprofessional fees as well as all out-of-pocket costs and expenses incurred by the prevailing party in such litigation through all appellate levels.

27. *No Third Party Beneficiaries.* Consultant and City agree that this Agreement and other agreements pertaining to Consultant's performance hereunder shall not create any obligation on Consultant or City's part to third parties. No person not a party to this Agreement shall be a third-party beneficiary or acquire any rights hereunder.

28. *Public Entity Crimes Act.* As of the full execution of this Agreement, Consultant certifies that in accordance with §287.133, Florida Statutes, it is not on the *Convicted Vendors List* maintained by the State of Florida, Department of General Services. If Consultant is subsequently listed on the *Convicted Vendors List* during the term of this Agreement, Consultant agrees it shall immediately provide City written notice of such designation in accordance with Paragraph 9 above.

29. *Entire Agreement.* This document incorporates and includes all prior negotiations, correspondence, conversations, agreements or understandings applicable to the matters contained herein, and the parties agree that there are no commitments, agreements or understandings concerning the subject matter of this Agreement that are not contained in this document. Accordingly, it is agreed that no deviation from the terms of this Agreement shall be predicated upon any prior representations or agreements, whether oral or written.

30. *Headings.* The headings or titles to Articles of this Agreement are not part of the Agreement and shall have no effect upon the construction or interpretation of any part of this Agreement.

31. *Counterparts.* This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. A photocopy, email or facsimile copy of this Agreement and any signatory hereon shall be considered for all purposes as original.

32. *Approvals.* Whenever CITY approval(s) shall be required for any action under this Agreement, such approval(s) shall not be unreasonably withheld.

33. *Absence of Conflicts of Interest.* Both parties represent they presently have no interest and shall acquire no interest, either direct or indirect, which would conflict in any manner with their performance under this Agreement and that no person having any conflicting interest shall be employed or engaged by either party in their performance hereunder.

34. *Promoting Project Objectives*. Consultant, its employees, subcontractors, and agents shall refrain from acting adverse to the City's interest in promoting the goals and objectives of the Project. Consultant shall take all reasonable measures necessary to effectuate these assurances. In the event Consultant determines it is unable to meet or promote the goals and objectives of the Project, it shall immediately notify the City and the City, may then in its discretion, terminate this Contract.

35. *Binding Effect*. The benefits and obligations imposed pursuant to this Agreement shall be binding and enforceable by and against the Parties.

36. *Severability*. Should any provision of this Agreement or the applications of such provisions be rendered or declared invalid by a court action or by reason of any existing or subsequently enacted legislation, the remaining parts of provisions of this Agreement shall remain in full force and effect.

37. *Employment Eligibility*. By entering into this Contract, the Consultant becomes obligated to comply with the provisions of Section 448.095, Fla. Stat., "Employment Eligibility." This includes but is not limited to utilization of the E-Verify System to verify the work authorization status of all newly hired employees, and requiring all subcontractors to provide an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply will lead to termination of this Contract, or if a subcontractor knowingly violates the statute, the subcontract must be terminated immediately. Any challenge to termination under this provision must be filed in the Circuit or County Court no later than 20 calendar days after the date of termination. If this contract is terminated for a violation of the statute by the Consultant, the Consultant may not be awarded a public contract for a period of 1 year after the date of termination

38. *Truth-In-Negotiation Certificate*. Consultant's compensation under this Agreement is based upon representations supplied to City by Consultant, and Consultant certifies that the information supplied, including without limitation in the negotiation of this Agreement, is accurate, complete, and current at the time of contracting. City shall be entitled to recover any damages it incurs to the extent such representation is untrue.

THE REMAINDER OF THE PAGE IS INTENTIONALLY LEFT BLANK

"CITY"

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year hereinabove written.

Attest:

DocuSigned by:
Kervin Alfred
D1C913A8ED334CA...
KERVIN ALFRED, CITY CLERK

CITY OF POMPANO BEACH

DocuSigned by:
By: Rex Hardin
502CB780EB3F480...
REX HARDIN, MAYOR

APPROVED AS TO FORM:

DocuSigned by:
By: Gregory P. Harrison
7052A67F15A44C8...
GREGORY P. HARRISON, CITY MANAGER

DocuSigned by:
Mark E. Berman
343B0B2C81D9424...
MARK E. BERMAN, CITY ATTORNEY

(SEAL)

DocuSigned by:

"CONSULTANT"

Witnesses:

TUNG NGUYEN
(Print or Type Name)

Juniper Marini
(Print or Type Name)

Carollo Engineers, Inc.

By: _____
Elizabeth Fujikawa, Vice President

Carollo Engineers, Inc.

By: _____
Brian LaMay, Vice President

STATE OF ration

COUNTY OF BROWARD

The foregoing instrument was acknowledged before me, by means of ☐ physical presence or ☐ online notarization this 6 day of July, 2023 by Elizabeth Fujikawa and Brian LaMay as Vice President of Carollo Engineers, Inc, a Delaware corporation authorized to do business in Florida on behalf of the corporation. They are personally known to me or who has produced _____ (type of identification) as identification.

NOTARY'S SEAL:

LUZ MARINA GONZALEZ
Notary Public - State of Florida
Commission # HH 286786
My Comm. Expires Jul 12, 2026
Bonded through National Notary Assn.

NOTARY PUBLIC, STATE OF FLORIDA

Luz Marina Gonzalez
(Name of Acknowledger Typed, Printed or Stamped)

HH 286786
Commission Number

Exhibit A

Engineers...Working Wonders With Water®

June 8, 2023

Mr. Phil Hyer
City of Pompano Beach
1205 NE 5th Avenue
Pompano Beach, FL 33060

Subject: Proposal for Engineering Services
Design of Phase IV Electrical Master Plan Improvements

Dear Mr. Hyer:

As requested, we have prepared the following proposed scope of services for the subject project.

PROJECT OVERVIEW

The City of Pompano Beach (CITY) Water Treatment Plant (WTP) has an aged electrical distribution system. The WTP is the City's source of drinking water and needs to maintain production under extreme conditions such as power outages and tropical storms. As a result, the electrical system needs the reliability to keep treatment processes and pumping systems in operation. In 2012, Carollo and Gamboa Engineers assessed the electrical system and found that the majority of the power distribution system was near the end of its useful life and needed a significant upgrade to maintain reliability and safety.

The City embarked on a phased program to upgrade the power distribution system for the WTP and replace the aging equipment. The work includes electrical equipment replacement with new technology and a redesign of the system to provide additional redundancy.

The Phase I and II improvements were successfully completed in 2014 and 2016. The new electrical systems have greatly increased reliability, longevity, and energy efficiency for the High Service Pump (HSP) Buildings 1 through 4. Subsequently, the Phase III improvements, the electrical switchgear upgrades of the Transfer Station, was completed in 2021.

The remainder of the identified electrical improvements will be conducted under this project as Phase IV and will include improvements to house new electrical switchgear, an additional 2 MW standby generator, motor control centers and variable frequency drives:

1. The existing HSP Buildings 5 through 6 will house new 5kV switchgear and the existing generators will be synchronized with the one new and one existing generator in the membrane building.
2. The existing dewatering building will be converted into an electrical building to house the new main power distribution switchgear.
3. The existing electrical room in the lime storage and feed building will house upgraded equipment.
4. The membrane building's generator room will be used to house a new generator and the equipment in the electrical room will be upgraded.

This work is described in more detail in the following sections.

HSP Buildings 5 and 6

The following improvements will be designed under this project:

1. Assumptions for HSP 5 and 6 Building:
    i. The existing diversion of roof gutter and downspout that discharges away from the building and currently causes ponding between the filter building and the pump station will not be modified.
    ii. The roof will remain as is.
    iii. The building's exterior coatings will remain as is, coatings for disturbed areas will be matched
    iv. Disturbed pavement surrounding the building will be patched.
2. Conversion of the Existing Florida Power and Light (FPL) Vault into an Electrical Room:
    a. General work to be designed:
        i. Conversion of the existing FPL Vault into an air-conditioned electrical room with insulated walls and ceiling.
        ii. Removal and block up of the FPL vault's existing louvers, L1, L4, L5, L6 and L7.
        iii. The desired elevation of the floor slab will be determined in light of future flood elevations. The floor slab will be designed to that elevation along with corresponding door elevations.
        iv. Assumptions:
            1) We assume that FPL will be demolishing and removing all of the existing transformers and related equipment under a separate contract. Coordination with FPL will be provided during this project as the phased removal of the transformers will be required.
    b. Electrical:
        i. The completion of the electrical room improvements is necessary to minimize the downtime during replacement of the existing 5kV generator switchgear needed to supply standby power to the HSPs. The room will house new 5kV arc-resistant switchgear with electrically operated circuit breakers to synchronize the two existing 900kW standby generators, including separate low voltage control panels for control and monitoring of the generators and a set of 125 VDC battery bank that will supply low voltage control power for the electrically operated circuit breakers, plus pertinent new power and control wiring
        ii. The generator's new 5kV switchgear will be interconnected through underground ductbanks to the new main power distribution switchgear located in the new electrical

building (converted dewatering building). Also, the two existing 900 kW 5kV generators will be synchronized with the existing 2,000kW Generator No. 3 and the proposed new 2,000kW Generator No. 4 to be located in the membrane building.

iii. The new electrical room will include new LED luminaires.

iv. The design will include cameras and access control, a smoke detection/fire alarm system interconnected with new fire detection and heat detecting devices in the existing electrical room, generator room and pump room. The new system will be interconnected to the SCADA PLC network for monitoring equipment status.

v. The design will include specifications to maintain the WTP in continuous operation and requirements for construction of the electrical improvements in the HSP Buildings 5 through 6 to be performed after the installation and functional testing of a new 2 MW standby generator in the membrane building.

vi. The synchronization and interconnection of Generator Nos. 1 and 2 controls with the remote Generators Nos. 3 and No. 4 will be through new underground fiber optic cables.

c. HVAC:

i. Modifications will be designed based on the needs for the new electrical gear. Redundancy for HVAC equipment and types will be evaluated during design for reliability and functional needs of the facility to meet the City's goal of having full redundancy for the AC units for the electrical rooms.

ii. Energy calculations required by the Florida Building Code for an existing facility will be developed.

iii. The existing louvers L1, L4, L5, L6 and L7 will be blocked in.

d. Plumbing/Fire Protection:

i. Assumptions:

1) We assume that this room will not need any fire (sprinklers) protection or plumbing.

e. Architectural/Structural:

i. The existing double door D1 will be removed and replaced at the required elevation due to raising of the floor height.

ii. New insulation will be required for the walls due to conversion into an air-conditioned space.

iii. The roofing structural double tees will need to be insulated to meet code requirements for air-conditioned spaces.

3. Generator Room:

a. General:

1) The floor slab elevation will remain as is unless the Building Department requires that the floor elevation be raised to accommodate the interconnecting doors to the adjacent electrical rooms

b. Electrical:
   i. The design will include new 5kV output feeders from the existing generators to the new 5kV synchronizing switchgear in the new electrical room (after the conversion of the FPL vault) and the conduits will be installed or embedded under the slab.
   ii. The electrical improvements in the generator room will include new LED luminaires.
   iii. The design will include a new heat detection system that is interconnected with the building fire alarm control panel.
c. HVAC:
   i. Replace existing aged air conditioning equipment.
d. Plumbing/Fire Protection:
   i. Assumptions:
      1) We assume that this room will not need any fire protection or plumbing.
e. Architectural:
   i. The connecting door to the electrical room will be replaced.
   ii. New floor finishes and wall coatings will be specified.
   iii. Protective walls or other protection for the radiators will be designed.
   iv. The cost to raise the generator room floor elevation will be evaluated.
   v. A new door between the generator room and new switchgear room will be added.
f. Mechanical:
   i. The existing mufflers will be left in place.
   ii. The existing pads for the two generators will be raised to the required elevation for storm surge protection. Modifications shall be made to fuel piping and combustion exhaust as necessary based on new elevation of pads.
   iii. The design will include requirements for temporary removal of the standby engine-generators as necessary to construct higher generator concrete pads.
   iv. The design will include the replacement (if necessary by condition) and relocation and extension of the existing diesel fuel piping between the main tank and day tank as well as the fuel piping to the high service pump diesel engine and related accessories. The day tanks should be provided with a bypass line and valves to allow the direct supply of fuel to the generators. Fusible safety devices will be included where appropriate.

4. Electrical Room:
   a. General:

i. The desired elevation of the floor slab or pad height under the switchgear will be determined in light of future flood elevations and the floor slab may be raised along with corresponding door elevations.

b. Electrical:

i. The existing 5kV main switchgear which distributes power to the majority of the lime softening treatment plant and pumping facilities will be demolished due to its aged condition, plus its limited configuration has the risk that a single point of failure would represent a major shutdown of power for high service pumping, (regardless if the standby power generators are functioning), all compounded by the risk that the floor elevation of the switchgear room could become flooded during a major hurricane event.

ii. The proposed new 5kV switchgear will be installed in the new electrical building (at the location of the dewatering building).

iii. The existing 5kV starters for 600 hp HSPs 5 and 6 will be replaced with 5kV variable frequency drives (VFDs).

iv. The proposed new 5kV VFDs will be fed with separate power feeders from the new main 5kV power distribution switchgear.

v. The improvements will include a new 480-volt motor control center in the main electrical room with two sources of power supply breakers and a tie-breaker for isolation of half of the MCC. The ability to isolate either half of the MCC will increase reliability, add flexibility for maintenance, and reduce the magnitude of shut-down for making future connections.

vi. The low voltage controls for the two standby generators will be relocated. The controls are to be separated from the 5kV equipment, to minimize the risks of arc flash hazards.

vii. The electrical improvements in the electrical room will include new LED luminaires.

viii. A heat detection system will be included and interconnected with the building fire alarm control panel.

ix. FPL coordination will be done for the demolition of the existing service transformers upon installation and complete functioning of the new service with two outdoor pad mounted transformers to be located at the proposed new electrical building.

c. Instrumentation and Controls:

i. The existing SCADA PLC will be upgraded with additional Input/output modules and software programming, as necessary to monitor the new 5kV synchronizing switchgear.

ii. The proposed speed controls for existing HSPs 5 and 6 will be interconnected between the new 5kV VFDs and SCADA PLC network, including the integration with the existing speed controls of HSP 2 through HSP 4.

iii. New electronic power meters in the pump's VFDs and the new MCCs will be integrated with SCADA network for the benefit to monitor the power consumption of pumps.

iv. Cameras and access control will be provided.

d. HVAC:

i. The design will provide for replacement of the existing aged air-conditioning system. Redundancy for HVAC equipment and types will be evaluated for reliability and functional needs to cool the proposed new 5kV VFDs for HSPs.

e. Plumbing/Fire Protection:

i. Assumptions:

1) We assume that this room will not need any fire (sprinkler) protection or plumbing.

f. Architectural/Structural:

i. The connecting double door to pump room will be replaced with access control (to prohibit access to the electrical switchgear room when the roll up door is open).

ii. The door between the electrical and generator room will be replaced.

iii. Coordination with the Building Department will be done for the floor elevations in the electrical rooms and generator rooms because of the interconnecting doors.

iv. New floor and wall coatings will be specified.

5. Pump Room:

a. General:

i. The floor elevation in the pump room will not be modified.

b. Electrical:

i. The existing outdoor 5kV Switches, 5kV Feeder and the indoor 5kV/480 volt transformer will be demolished.

ii. The existing indoor 480 volts switchboard in the pump room will be replaced due to aged condition. The new switchboard will be specified with dual breakers to facilitate periodic inspection and maintenance. The functions of the new switchboard will be relocated to the air-conditioned electrical room. Some of the existing pump's auxiliary devices and electrical junction boxes will be raised to be at same elevation of the pump's motor.

c. Instrumentation and Controls:

i. The proposed VFD speed controls for existing HSP 5 and HSP 6 will be interconnected with SCADA PLC network and integrated with the existing speed controls of HSP 2 through HSP 4.

ii. Cameras and access control will be provided.

d. Process Mechanical:

i. The existing HSP 5 and HSP 6 will be converted to operate at variable speed to more closely match the water demand of the distribution system and yield energy savings for high service pumping through integrated and parallel speed controls with the other existing HSP 2 through HSP 4.

ii. The existing 600 hp pump motors will not be replaced, to be verified by the VFD manufacturer's confirmation that the output power quality of the new drives will not require an Inverter Duty Motor's winding.

iii. The design will include the specification of requirements for harmonic analysis of the pump's motor performance under VFD power source.

e. Architectural/Structural:

i. No work to be provided.

f. HVAC:

i. The existing roof fans were recently replaced and will not be modified.

ii. Assumptions:

1) Fan tie downs for high winds and an existing louver replacement was included under previous projects.

2) No other HVAC improvements will be made.

g. Plumbing/Fire Protection:

i. Assumptions:

1) We assume that this room will not need any fire sprinklers protection or plumbing.

h. Architectural:

i. New wall coatings will be specified.

New Electrical Building

The existing dewatering building will be repurposed into a new Electrical Building. The following improvements will be made:

1. General:

a. The existing dewatering building will be converted into a new electrical building. The second floor will house the electrical equipment to reduce impacts due to storm surge.

b. Assumptions:

i. The building will not be required to be brought up to current adopted codes due to occupancy change. Additional scope will be required should updates be required by the Authorities Having Jurisdiction (AHJ).

ii. The two access stairs to the second floor were recently replaced and will not be modified.

iii. The roof was recently replaced and will not be modified.

iv. The first floor of the dewatering building will remain as is.

v. The building exterior coatings will remain as is, coatings will be repaired as necessary if disturbed by construcion

vi. If pavement areas surrounding the building are disturbed during construction, they will be patched.

2. Electrical:

a. Cameras and access control will be specified.

b. Provide coordination with FPL to provide the new electric service and two outdoor pad mounted transformers to be located on the new mezzanine of the proposed new electrical building.

c. The proposed new 5kV double ended arc-resistant switchgear will be designed to be installed in the new electrical building with two sources of FPL power supply breakers and two tie-breaker for isolation of half of the switchgear, plus a center bus section with 5kV breakers for the connection of three standby power generators.

d. Remote low voltage control panel for the circuit breakers will be designed to be separated from the 5kV equipment, to minimize the risks of arc flash hazards during manual switchgear operation.

e. A new 480-volt power distribution switchgear will be designed to replace the function of existing switchgears at TU-1 building and TU-2 building. Also, the main 480 volts double ended switchgear will be designed to provide power to the remote switchboard at the transfer pump station, to the MCCs in the chemical building, and to the new MCC for the existing sludge thickener pumps.

f. The 480-volt MCC in the electrical room will be designed for replacement.

g. Low voltage controls for standby Generators No. 3 and No. 4 will be designed to be separated from the 5kV equipment, to minimize the risks of arc flash hazards during manual operation of the generator's circuit breakers.

h. Two 5kV/480 volt stepdown pad mounted transformers will be designed to supply power to the 480 volt switchgear.

i. A battery bank of 125 volts DC and transfer switch, plus a DC panelboard will be designed to control power for the electrically operated circuit breakers.

j. The electrical improvements in the electrical building will be designed with new LED luminaires.

k. A new heat detection system will be designed and interconnected with the building fire alarm control panel.

l. A new security door access and CCTV system will be designed and interconnected with the plant Security access network.

m. The low voltage control panels for synchronizing generators will include PLC for monitoring status of circuit breakers and electronic power meters and will be interconnected with the SCADA network.

3. Instrumentation and Controls:
   a. Capacity of the existing PLC will be evaluated.
   b. The existing SCADA PLC will be upgraded with additional Input/output modules and software programming, as necessary to monitor the new 5kV power distribution switchgear, 480 volts switchgear, new MCC and motor starters related to the existing sludge thickener.
   c. Also, new electronic power meters in the switchgear and the new MCCs will be integrated with SCADA network for the benefit to monitor the power consumption of the entire water treatment plant.
4. HVAC:
   a. A new HVAC system will be designed to service the electrical gear. Redundancy for HVAC equipment and types will be evaluated for reliability of the facility.
   b. Energy calculations required by the Florida Building Code for an existing facility will be provided.
   c. The existing ventilation fans will be specified to be salvaged.
   d. The HVAC equipment will be located on a new external platform at the same level of the electrical equipment. To protect the equipment from debris during a hurricane, a wall (CMU or cast in place) will be designed.
   e. Existing HVAC systems will be demolished.
   f. The existing openings will be specified for closure as required for new HVAC systems.
5. Structural/Architectural:
   a. A demolition drawing will be prepared for the existing dewatering equipment.
   b. The addition of insulation for the walls and a new dropped ceiling will be designed to meet code requirements to provide an air-conditioned space.
   c. The existing rollup doors will be specified for removal with the openings filled with CMU block and stucco finish.
   d. The single-entry doors will be designed to be replaced.
   e. One of the rollup doors with be designed with a new replacement that is adequate for entry and access for the electrical equipment.
   f. The floor finish and wall coatings will be specified for replacement according to the latest standards for the City's WTP.
6. Plumbing/Fire Protection:
   a. Updates to plumbing piping and appurtenances will be designed due to conversion of building from a Dewatering Facility to an Electrical Building.

b. The existing plumbing piping will be designed for demolition and replacement as required for the new electrical room.

7. Assumptions for New Electrical Building:
    i. This building will not need any fire sprinkler protection or plumbing.
    ii. There will not be any stormwater collection or storage modifications needed.

Chemical Building

The following improvements will be designed for the Chemical Building:

1. General:
    a. The existing electrical room will be used to house new electrical equipment (described below).
    b. Assumptions:
        i. The size of the electrical room will not be changed.
        ii. Building will not be required to be brought up to current adopted codes due to occupancy change. Additional scope will be required should updates be required by AHJ.
2. Electrical:
    a. Cameras and access control will be specified.
    b. The aged MCC equipment will be designed for replacement to increase safety and reliability. In general, the new MCCs will consist of a double-ended scheme with two sources of input power and a tie circuit breaker, for convenience to isolate half of the MCC for periodic inspection or maintenance.
    c. The branch wiring between the new MCC and the process equipment will be specified to be reused to the extent possible, after verification that existing wiring conditions are acceptable.
3. Instrumentation and Controls:
    a. The existing SCADA PLC in the chemical building will remain. Capacity of the PLC will be evaluated.
    b. Motor starters on the new MCC will be designed to be interconnected with the existing PLC to match existing controls.
    c. Also, new electronic power meters in the new MCCs will be designed to be integrated with SCADA network for the benefit to monitor the power consumption of the process equipment in the chemical building.
4. HVAC:
    a. Evaluate current AC unit for condition and capacity.

b. HVAC modifications will be designed for the electrical room based on the electrical gear specified. Redundancy for HVAC equipment and types shall be evaluated during final design for reliability of facility.
c. Provide required energy calculations required by the Florida Building Code for an existing facility.
d. The existing HVAC equipment and plumbing piping will be specified for removal as required for the new electrical room.

5. Plumbing/Fire Protection:
   a. Assumptions:
      i. We assume that this room will not need any fire sprinklers protection or plumbing.
6. Architectural:
   a. The interior walls of the electrical room will be specified to be coated.
   b. The floor finish will be specified to be recoated according to the City's WTP standard.
7. Mechanical Process:
   a. The existing lime slakers and related process equipment will not be modified.

Membrane Building

The existing separate FPL electric service for the membrane building will be designed to be replaced with a new Electrical Service from the new main 5kV switchgear in the new electrical Building, and addition of a new standby power generator and modifications to the controls of the standby power generators.

The following improvements will be included:

1. General:
   a. The scope of the electrical design work will be limited to the replacement of electric service for the existing 480 volts switchgear at the membrane building, the output feeder modifications of the existing 2,000kW generator with a step-up 480 volt /5kV transformer, plus the addition of a new 2,000kW – 5kV Generator.
   b. Assumptions:
      i. Building will not be required to be brought up to current adopted codes due to additional generator in the existing allocated space in the generator room.
      ii. No stormwater collection or diversion modifications be included.
2. Electrical:
   a. Cameras and smoke detectors will be specified.
   b. FPL coordination will be provided for the removal of their two outdoor pad mounted transformers.

c. Two new City owned pad mounted 5kV/480-volt transformers will be designed to replace the existing FPL transformers.

d. A third pad mounted substation type 5kV/480-volt transformer will be designed to step-up the voltage of the existing Generator No. 3 and for synchronization of four standby power generators at the new 5kV main switchgear.

e. The description of the related design for the proposed new 5kV double ended arc-resistant switchgear and generator's remote control panels is included in the scope of work at the new main electrical building.

3. Instrumentation and Controls:

a. The new 2 MW generator will be interconnected with the existing SCADA PLC in the membrane building for monitoring equipment status in addition to the monitoring done at the new electrical building.

4. Mechanical

a. A new 2 MW standby generator will be designed to be installed in the existing facility. The generator will be Tier 2.

b. The existing fuel piping will be evaluated for condition and replaced if necessary. Sizing will be evaluated for capacity for two generators. Value of a redundant bulk tank supply line will also be evaluated.

c. The new generator's diesel fuel piping will be connected to the existing diesel fuel storage and feed system that supplies fuel to the existing Generator No. 3. The system will not be modified for storage capacity.

d. The generator day tanks will be provided with a bypass line and valves to allow the direct supply of fuel to the generators.

e. The existing wall mounted ventilation louvers for the generators will be verified to be of adequate size and to be located above the potential flood level.

f. Assumptions:

i. The access for installing the new Generator No. 4 will be through the existing wall opening where the ventilation louver is installed.

g. The new 2 MW Generator No. 4 will be permitted with FDEP and fire department.

h. Assumptions:

i. No modifications will be provided to mechanical and fuel systems of existing generators.

5. HVAC:

a. A new ventilation system will be designed for the additional load from the addition of the new 2,000kW generator.

b. Assumptions:

i. No modifications to the existing HVAC system will be made.

6. Structural/Architectural:
    a. An outdoor concrete pad over an elevated berm will be designed for the installation of three pad mounted 5kV/480 volt-transformers, to be located above grade and raised to limit impacts from flooding.
    b. The existing steel frame of the horizontal cooling radiator and fan for Generator No. 3 will be designed to be raised to limit impacts from flooding.
    c. A wall will be designed to provide protection for the Generator radiators from debris during storms.
    d. The elevation of the double door on the north side of the generator room will be evaluated to be raised to minimize water entry from the outdoor driveways into the generator room.
    e. The removal of existing outdoor trees along NE 5th Avenue will be considered, to reduce risk to the generator's radiators.
7. Plumbing/Fire Protection:
    a. Assumptions:
        i. We assume that this building will not need any fire sprinkler protection or plumbing.

Site and Yard Work

The existing FPL electric service at the HSP Buildings 5 and 6 from NE 3rd Avenue and the existing service at the membrane building from NE 5th Avenue will be replaced with a new FPL Electrical Service from NE 5th Avenue near the dewatering building to the new main 5kV switchgear to be located in the new electrical Building.

The following yard improvements will be included:

1. General:
    a. The scope of design work will include:
        i. The replacement and removal of existing 5kV underground cables that interconnect the existing electrical switchgear at the HSP Buildings 5 and 6 with the TU-1 substation, TU-2 substation and the 5kV MCCs at the HSP Buildings 1 through 4.
        ii. The new 5kV underground power distribution system.
        iii. The new 480-volt underground power distribution system.
        iv. The new Fiber Optic communication system that will interconnect the new controls of Generators No. 1 and No. 2 with the remote Generator No. 3 and new Generator No. 4.
2. Mechanical:
    a. The new Generator No. 4 diesel fuel piping will be connected to the existing diesel fuel storage and feed systems that supplies fuel to the existing Generator No. 3.
3. Electrical:
    a. FPL coordination will be made for the removal of their transformers and demolition of existing underground service conduits.

b. FPL coordination will be made for their requirements for new underground service conduits from NE 5th Avenue to the proposed new electric building.

c. New underground 5kV ductbanks and manholes will be designed for the power distribution feeders from the new electrical building to the new transformers at the membrane building, to the Generator Nos. 3 and No. 4 at the membrane building, to the existing 5kV MCC-A and MCC-B at the HSP Buildings 1 through 4, to the new 5kV Generator's No. 1 and No. 2 synchronizing switchgear and the 5kV VFDs for speed control of HSP 5 and HSP 6.

d. New underground 480-volt ductbanks and manholes will be designed for the power distribution feeders from the new electrical building to the switchboard at the transfer pump station, to the MCCs at the chemical building and empty ductbank provisions through manholes, to facilitate future 480 volt power to future facilities that may replace the Lime softening process with perhaps future additional membrane systems.

4. Instrumentation and Communication Systems:

a. New underground signal ductbanks and manholes will be designed for the interconnection of the existing PLC at the new electrical building with the SCADA network.

b. New Fiber Optic communication system will be designed to interconnect the new controls of Generators No. 1 and No. 2 with remote Generator No. 3 and new Generator No. 4.

c. New underground empty ductbanks and manholes will be designed to interconnect the existing SCADA network with future facilities that may replace the Lime softening process with future additional membrane systems.

Modifications of Existing TU-1 Building and TU-2 Building

1. General:

a. The scope of the design work will be limited to the removal and disposal of existing transformers and switchgear at the TU-1 substation, TU-2 substation.

b. No improvements to the existing buildings are included in the scope of work.

The work will be completed in the following tasks.

TASK 1: PROJECT MANAGEMENT

Task 1.1 - Project Management, Communications, and Meetings

The CONSULTANT will provide overall project management and communication between its staff and the CITY. The budget, project tasks, and schedule will all be tracked and managed. CONSULTANT will organize and facilitate project meetings over the course of the project, including the development of meeting agendas and meeting minutes. In addition to the task specific review meetings identified for the tasks below, the following meetings are anticipated:

- Kickoff Meeting.
- Monthly Progress Meetings.

Task 1.2 - Progress Reports

The CONSULTANT will deliver monthly progress reports that detail the work completed during the previous month and the work planned for the following month. These reports will be included in the request for monthly progress payments.

Task 1 Deliverables

- Meeting agenda (PDF).
- Meeting minutes (PDF).
- Monthly progress reports (PDF).

TASK 2: DATA GATHERING AND CONDITION ASSESSMENT

Task 2.1 - Data Gathering

The CONSULTANT will collect and review previous data and reports relating to the current conditions and design, existing equipment, piping and electrical to be demolished, and planned improvements of the scoped facilities. Data collection will include a variety of sources based on the best available data. The following data request list is anticipated, and other additional data may be requested as available and as needed.

- Previous structural assessment reports.
- Existing as built or record drawings.
- Autocad files.

Task 2.2 - Condition Assessment

In addition to the site visits previously conducted, the CONSULTANT may conduct additional field visits to assess current conditions.

TASK 3: DETAILED DESIGN

Using the Electrical Master Plan, the CONSULTANT will prepare detailed design contract documents, which will include progress submittals at the 60%, 100%, and Issued for Bid design milestones. Design documents will include drawings, technical specifications, and opinion of probable construction cost (OPCC) as outlined in each detailed design progress submittal task below.

Drawings will be done in 3D using Carollo's standards.

Task 3.1 - 60% Design

Using the project definition in the Electrical Master Plan, the CONSULTANT will develop detailed design drawings and technical specifications to a 60% complete level. The 60% design shall include the following:

1. General Drawings: Cover, index of drawings, general abbreviations/symbology/notes.
2. Civil Drawings: Overall site plan.

3. Structural Drawings: Any necessary structural repair plans, photographs, and details; modifications; notes and typical details.
4. HVAC and Plumbing Drawings: Plans for each of the repurposed rooms; Schematics, sections, and typical details; and equipment layout to confirm dimensions
5. Electrical Drawings: Single line drawings, RIO riser diagrams, power plans, site lighting plans; Switchgear, MCCs elevation drawings, Equipment layout drawings, to confirm room dimensions.
6. Instrumentation and Control Drawings:
    a. 60% Technical Specifications for major equipment and elements of work, including electrical switchgear, air-conditioning.
    b. A preliminary Engineer's Opinion of Probable Construction Cost (OPCC).

Task 3.1.1. - 60% Design Review Meeting

The 60% design documents will be delivered to the CITY for review. A review workshop with the CONSULTANT and the CITY will be held to present and review the 60% design documents. The CITY's review comments will be logged, and responses provided.

Task 3.2 - 100% Design

The CONSULTANT will develop the design documents to a 100% completion level. The CITY's comments on the 60% design documents will be addressed and incorporated into the design. The design will detail the requirements for bidding and construction of the project and shall be suitable to initiate permitting review by the regulatory agencies identified in Task 5. The CONSULTANT will develop a full set of project specifications, including front end documents (Division 00), using the CITY's standard front-end documents (Instruction to Bidders, General Covenants and Conditions, Supplementary General Conditions, and other applicable provisions and appendices). Project specifications will be modified as necessary by the CONSULTANT to conform to the requirements of the CITY's standard front-end documents. The CONSULTANT will develop a conceptual construction schedule to determine the period of time required for construction and define substantial and final completion durations. The 100% design shall include the following:

1. 100% Design Drawings.
2. 100% Design Specifications.
3. Updated 100% Design Engineer's OPCC.
4. Schedule of Bid Items.

Task 3.2.1. - 100% Design Review Meeting

The 100% design documents will be delivered to the CITY for review. A review workshop with the CONSULTANT and the CITY will be held to present and review the 100% design documents. Design documents will be revised to address CITY comments and submitted for permitting review by the regulatory agencies identified in Task 5. The CITY's review comments will be logged, and responses provided.

Task 3.3 - Issued for Bid Documents

The CONSULTANT will attend one meeting with the CITY's procurement department to understand the procurement requirements for the Issued for Bid Documents. The CONSULTANT will update the design drawings and specifications to incorporate requirements for procurement, permitting review comments from Task 5, and the CITY's 100% Design review comments to develop Issued for Bid documents. The 100% design OPCC will be updated, if required, to address changes incorporated into the Issued for Bid documents. The Issued for Bid documents will be provided to the CITY to bid the project and to procure a Contractor.

Task 3 Deliverables

1. 60% Design Drawings (PDF).
2. 60% Design Technical Specifications (PDF).
3. Preliminary Engineer's OPCC (PDF).
4. 60% Design Review Meeting Agenda and Meeting Minutes.
5. 60% Design Review Comment Log.
6. 100% Design Drawings (PDF).
7. 100% Design Specifications and Schedule of Bid Items (PDF).
8. Updated 100% Design Engineer's OPCC (PDF).
9. 100% Review Meeting Agenda and Meeting Minutes.
10. 100% Design Review Comment Log.
11. Bid Documents Procurement Meeting Agenda and Meeting Minutes.
12. Issued for Bid Drawings (PDF, one signed and sealed full size hard copy).
13. Issued for Bid Specifications (PDF, one signed and sealed bound copy).
14. Updated Issued for Bid Engineer's OPCC (PDF).

TASK 4: PERMITTING

Task 4.1 - FDEP Permit

We assume that the Florida Department of Environmental Protection (FDEP) in Palm Beach County will not require a permit for work that should be considered maintenance and minor repairs. We will prepare an overview of the work and submit and request a waiver from the FDEP for the construction permit for this portion of the work.

Task 4.2 - Pompano Beach Building Department Permit

The CONSULTANT will submit the 100% Design Drawings to the City of Pompano Beach Building Department for dry-run review and approval. Permit applications will be prepared and provided to the CITY for signatures, as required. The CONSULTANT will revise design plans to address comments and resubmit to the Building Division as required to obtain approval. One meeting with the Building Department has been assumed to discuss and resolve any outstanding comments. The contractor

awarded the construction contract will be responsible for obtaining the actual Building Department permits for construction.

Task 4 - Deliverables

- Responses to FDEP RFIs and comments.
- Completed Pompano Beach Building Department Permit Applications (pdf and one hard copy of each required application).
- Signed and Sealed 100% design drawing (pdf and hard copies, as required by regulatory agencies).

TASK 5: BIDDING

Task 5.1 - Bidding Services

The CONSULTANT will assist the CITY in procuring a contractor for construction of the project by providing the following services during the bidding process.

1. Coordinate with the CITY's purchasing department to prepare the documents for bidding and in developing the advertisement for bid project description.
2. Pre-Bid Conference: Attend one Pre-Bid Conference and field visit.
3. Bidder RFIs: Provide responses to bidder's Request for Information (RFI). The CITY will receive all bidders' questions and forward them to the CONSULTANT for review and response. Carollo will revise the responses based upon the CITY's comments and acceptability to the CITY for amendment of the bid documents. The CITY will be responsible for receiving and distributing RFI responses to all bidders.
4. Addendum: If in responding to bidder's questions, a significant clarification or change to the design is required, the CONSULTANT will prepare up to two addenda to revise the Issued for Bid documents. The CITY will be responsible for receiving and distributing RFI responses to all bidders.
5. Evaluation of Bids: Attend the bid opening. Prepare a tabulation of received bids and evaluate up to two bids to confirm they are responsive and meet the minimum qualifications. It is assumed that the lowest bid will be reviewed first and if it is confirmed that the bid is responsive and meets the minimum qualifications, then no additional bid reviews will be required. Should the lowest bid not meet the requirements, the second lowest bid will be reviewed. It has been assumed that the CITY'S Purchasing Department will also review the bids to determine they are responsive and meet the criteria for necessary bonds, insurance, etc. Provide an award recommendation letter to the CITY.

Task 5.2 - Conformed Documents

The CONSULTANT will develop Conformed Documents by updating the Issued for Bid documents to incorporate modifications resulting from the bid-phase period RFIs and addenda. Following preparation

of the Conformed Construction Drawings and Specifications, the CONSULTANT shall make such documents available to the CITY and the contractor awarded the project.

Task 5: Deliverables

1. RFI Responses.
2. Addendum Revised Documents.
3. Bid Award Recommendation Letter (pdf).
4. Conformed Drawings (pdf, one half size and one full size hard copy).
5. Conformed Specifications (pdf, one bound hard copy).

SCHEDULE

The services described above are anticipated to be completed in accordance with the following summary. The CONSULTANT will make efforts to keep the project on schedule within reason. However, there are many factors which may affect this overall schedule, and this will require prompt attention and involvement from the CITY to maintain project progress.

The schedule below is the CONSULTANT's best estimate based on preliminary information, and may vary based upon available data, meeting schedule, permitting, bidding process, and contractor's availability and schedule. A detailed project schedule will be provided following notice to proceed.

Task No.	Task Description	Estimated Duration from NTP (weeks)
1	Project Management	19
2	Data Gathering and Condition Assessment	1
3	Detailed Design	24
4	Permitting	4
5	Bidding	4

Schedule Notes:

- The schedule assumes that the CITY will complete all reviews within (2) weeks of receiving the submittals.
- Four weeks have been assumed for permitting.
- The bidding duration is assumed to be approximately four weeks.

PROJECT FEE

The total compensation and billing method are shown in the table below.

Task No.	Task Description	Fee ($)	Billing Method
1	Project Management	$44,488	Lump Sum
2	Data Gathering and Condition Assessment	$23,959	Lump Sum
3	Detailed Design	$1,454,866	Lump Sum
4	Permitting	$29,803	Lump Sum
5	Bidding and Conformed Documents	$37,825	Lump Sum
	Total Fee	$1,590,941	

The City shall make payments to Carollo for services performed in accordance with the following requirements:

Charges will be invoiced on a monthly basis as a percent complete by task.

SUBCONSULTANTS

Gamboa Engineering will be a subconsultant for electrical engineering.

ASSUMPTIONS AND CITY RESPONSIBILITIES

Due to the nature of this project, certain assumptions apply to this Scope of Services. To the extent possible, these assumptions are stated within this document and are reflected in the budget. If the project task requirements are different from the assumptions presented in this Scope of Services, or if the CITY desires additional services, the resultant change in scope will serve as a basis for amending this project assignment or initiating the development of a new project assignment as agreed to by both the CITY and CONSULTANT. The following assumptions and CITY responsibilities apply to this project:

- The CONSULTANT shall be entitled to rely upon the accuracy of the data and information supplied by the CITY without independent review or evaluation.
- The CITY shall attend all workshops and review meetings and facilitate site visits to the facilities to maintain the progress of the project according to the schedule.
- The CITY will provide all required information within the period established in the schedule contained in this Scope of Services. The schedule is based on timely receipt of data and the bid process from the CITY. The CITY shall review draft deliverables and provide comments to the CONSULTANT on a prompt basis.
- Investigations and condition assessment will be limited to visual observation. It has been assumed that the condition of the structures is such that non-destructive or destructive testing is not required. If the investigation and condition assessment determine the condition of the structures is different than assumed and structural testing is recommended, the CONSULTANT will notify the CITY and discuss modifications to the scope of work to include the recommended testing.
- No topographic survey or geotechnical analysis is required or will be conducted for this scope.
- The CITY will provide its standard front-end documents (Division 00) for use in the bid documents.
- The schedule is based on timely receipt of data and the bid process from the CITY. The CITY shall review draft deliverables and provide comments to the CONSULTANT on a prompt basis.
- The CITY will be responsible for all permitting fees.
- Bidding services do not include services for any bid protests.
- Third party litigation services or expert witness services are not included.
- The period required for obtaining permit approval is beyond the control of CONSULTANT, except for issues concerning the permitting of the design and CONSULTANT's ability to respond to permitting agency requests for information. CONSULTANT will submit permitting information and respond to requests for information promptly.
- In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for potential projects, Consultant has no control over cost or price of labor and material; unknown or latent conditions of existing equipment or structures that may affect operation and maintenance costs; competitive bidding procedures and market conditions; time or quality of performance of third parties; quality, type, management, or direction of operating personnel; and other economic and operational factors that may materially affect the ultimate project cost or schedule. Therefore, Consultant makes no warranty that CITY's actual project costs, financial aspects, economic feasibility, or schedules will not vary from Consultant's opinions, analyses, projections, or estimates.

ATTACHMENT A: DETAILED FEE BREAKDOWN

Please contact us with any questions.

Sincerely,

CAROLLO ENGINEERS, INC.

Liz Fujikawa
Vice President, Client Services Manager

Laura Baumberger
Senior Vice President, Client Services Director

LF:tb

EXHIBIT B

INSURANCE REQUIREMENTS

CONSULTANT shall not commence services under the terms of this Agreement until certification or proof of insurance detailing terms and provisions has been received and approved in writing by the CITY's Risk Manager. If you are responding to a bid and have questions regarding the insurance requirements hereunder, please contact the City's Purchasing Department at (954) 786-4098. If the contract has already been awarded, please direct any queries and proof of the requisite insurance coverage to City staff responsible for oversight of the subject project/contract.

CONSULTANT is responsible to deliver to the CITY for timely review and written approval/disapproval Certificates of Insurance which evidence that all insurance required hereunder is in full force and effect and which name on a primary basis, the CITY as an additional insured on all such coverage.

Throughout the term of this Agreement, CITY, by and through its Risk Manager, reserve the right to review, modify, reject or accept any insurance policies required by this Agreement, including limits, coverages or endorsements. CITY reserves the right, but not the obligation, to review and reject any insurer providing coverage because of poor financial condition or failure to operate legally.

Failure to maintain the required insurance shall be considered an event of default. The requirements herein, as well as CITY's review or acceptance of insurance maintained by CONSULTANT, are not intended to and shall not in any way limit or qualify the liabilities and obligations assumed by CONSULTANT under this Agreement.

Throughout the term of this Agreement, CONSULTANT and all subcontractors or other agents hereunder, shall, at their sole expense, maintain in full force and effect, the following insurance coverages and limits described herein, including endorsements.

A. Worker's Compensation Insurance covering all employees and providing benefits as required by Florida Statute, Chapter 440. CONSULTANT further agrees to be responsible for employment, control and conduct of its employees and for any injury sustained by such employees in the course of their employment.

B. Liability Insurance.

(1) Naming the City of Pompano Beach as an additional insured as CITY's interests may appear, on General Liability Insurance only, relative to claims which arise from CONSULTANT's negligent acts or omissions in connection with CONSULTANT's performance under this Agreement.

(2) Such Liability insurance shall include the following checked types of insurance and indicated minimum policy limits.

Type of Insurance		Limits of Liability		
GENERAL LIABILITY:		Minimum 1,000,000 Per Occurrence and $2,000,000 Per Aggregate		
* Policy to be written on a claims incurred basis				
XX	comprehensive form	bodily injury and property damage		
XX	premises - operations	bodily injury and property damage		
__	explosion & collapse hazard			
__	underground hazard			
XX	products/completed operations hazard	bodily injury and property damage combined		
XX	contractual insurance	bodily injury and property damage combined		
XX	broad form property damage	bodily injury and property damage combined		
XX	independent contractors	personal injury		
XX	personal injury			
__	sexual abuse/molestation	Minimum $1,000,000 Per Occurrence and Aggregate		
__	liquor legal liability	Minimum $1,000,000 Per Occurrence and Aggregate		
AUTOMOBILE LIABILITY:	☐	Minimum $1,000,000 Per Occurrence and $2,000,000 Per Aggregate. Bodily injury (each person) bodily injury (each accident), property damage, bodily injury and property damage combined.		
XX	comprehensive form	☐ Minimum $10,000/$20,000/$10,000 (Florida's Minimum Coverage)		
XX	owned			
XX	hired			
XX	non-owned			
REAL & PERSONAL PROPERTY				
___	comprehensive form	Agent must show proof they have this coverage.		
EXCESS LIABILITY			Per Occurrence	Aggregate
__	other than umbrella	bodily injury and property damage combined	$2,000,000	$2,000,000
PROFESSIONAL LIABILITY			Per Occurrence	Aggregate
XX	* Policy to be written on a claims made basis		$1,000,000	$1,000,000

(3) If Professional Liability insurance is required, CONSULTANT agrees the indemnification and hold harmless provisions set forth in the Agreement shall survive the

termination or expiration of the Agreement for a period of three (3) years unless terminated sooner by the applicable statute of limitations.

C. Employer's Liability. If required by law, CONSULTANT and all subcontractors shall, for the benefit of their employees, provide, carry, maintain and pay for Employer's Liability Insurance in the minimum amount of One Hundred Thousand Dollars ($100,000.00) per employee, Five Hundred Thousand Dollars ($500,000) per aggregate.

D. Policies: Whenever, under the provisions of this Agreement, insurance is required of the CONSULTANT, the CONSULTANT shall promptly provide the following:

(1) Certificates of Insurance evidencing the required coverage;

(2) Names and addresses of companies providing coverage;

(3) Effective and expiration dates of policies; and

(4) A provision in all policies affording CITY thirty (30) days written notice by a carrier of any cancellation or material change in any policy.

E. Insurance Cancellation or Modification. Should any of the required insurance policies be canceled before the expiration date, or modified or substantially modified, the issuing company shall provide thirty (30) days written notice to the CITY.

F. Waiver of Subrogation. CONSULTANT hereby waives any and all right of subrogation against the CITY, its officers, employees and agents for each required policy. When required by the insurer, or should a policy condition not permit an insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then CONSULTANT shall notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy which includes a condition to the policy not specifically prohibiting such an endorsement, or voids coverage should CONSULTANT enter into such an agreement on a pre-loss basis.

Exhibit C

E-04-20 Addendum 4
Carollo Engineers Inc.
Supplier Response

Event Information

Number: E-04-20 Addendum 4
Title: Master Plan Update, Design and Consulting Services for
Type: Request for Qualifications
Issue Date: 1/14/2020
Deadline: 2/20/2020 02:00 PM (ET)
Notes: Pursuant to Florida Statutes Chapter 287.055 "Consultants' Competitive Negotiation Act" the City of Pompano Beach invites professional firms to submit qualifications and experience for consideration to provide professional design and consulting engineering services, including: advanced water treatment systems, electrical system master planning, bid specifications, permitting services, bidding assistance, construction services and certifications to the City for the project listed below:

Project: Master Plan Update, Design and Consulting Services for:
Water Treatment Plant 5 kV Electrical System

The City will receive sealed proposals until **2:00 p.m. (local), February 20, 2020**. Proposals must be submitted electronically through the eBid System on or before the due date/time stated above. Any proposal received after the due date and time specified, will not be considered. Any uncertainty regarding the time a proposal is received will be resolved against the Proposer.

Proposer must be registered on the City's eBid System in order to view the solicitation documents and respond to this solicitation. The complete solicitation document can be downloaded for free from the eBid System as a pdf at: https://pompanobeachfl.ionwave.net/CurrentSourcingEvents.aspx. The City is not responsible for the accuracy or completeness of any documentation the Proposer receives from any source other than from the eBid System. Proposer is solely responsible for downloading all required documents. A list of proposers will be read aloud in a public forum.

Contact Information

Contact: Jeff English
Address: Purchasing
1190 NE 3rd Avenue
Building C
Pompano Beach, FL 33060
Phone: (954) 786-4098
Fax: (954) 786-4168
Email: purchasing@copbfl.com

Carollo Engineers Inc. Information

Contact: Elizabeth Fujikawa
Address: 2728 North University Drive
Coral Springs, FL 33065
Phone: (954) 837-0030
Email: efujikawa@carollo.com

By submitting this Response I affirm I have received, read and agree to the all terms and conditions as set forth herein. I hereby recognize and agree that upon execution by an authorized officer of the City of Pompano Beach, this Response, together with all documents prepared by or on behalf of the City of Pompano Beach for this solicitation, and the resulting Contract shall become a binding agreement between the parties for the products and services to be provided in accordance with the terms and conditions set forth herein. I further affirm that all information and documentation contained within this response to be true and correct, and that I have the legal authority to submit this response on behalf of the named Supplier (Offeror).

Elizabeth Fujikawa — *Signature*

efujikawa@carollo.com — *Email*

Submitted at 2/20/2020 9:34:21 AM

Requested Attachments

Solicitation Proposal — PompanoBeach-ElectricalMasterPlan-SOQ0220.pdf

Electronic version of proposal must be uploaded to the Response Attachments tab. The file size for uploads is limited t o 250 MB. If the file size exceeds 250 MB the response must be split and uploaded as two (2) separate files.

Local Business Program Forms — LocalBusinessParticipationForm.pdf

Local Business Program Forms from the attachments tab are to be completed and uploaded to this tab.

Tier 1 / Tier 2 Local Business Form — Tier1-Tier2ComplianceForm.pdf

To comply with the City's Local Business Program, confirming or denying your status as a Tier-1 or Tier-2 vendor, you must complete this form and upload it to the Response Attachments tab.

Response Attachments

CarolloEngineers-FinancialStatements-Confidential.PDF

Carollo Engineers Financial Statements (Confidential)

Bid Attributes

1	**Extension of prices, terms and conditions to other governmental entities** If awarded the contract resulting from this bid, will your company agree to extend the same prices, terms and conditi ons to other governmental entities? (Note -- Optional, agreement not required for contract award.) Indicate by selec ting yes or no from the drop down menu. Yes
2	**Conflict of Interest** For purposes of determining any possible conflict of interest, all bidders must disclose if any City of Pompano Beac h employee is also an owner, corporate officer, or employee of their business. Indicate either "Yes" (a City employee is also associated with your business), or "No". (Note: If answer is "Yes", you must file a statement with the Supervis or of Elections, pursuant to Florida Statutes 112.313.)Indicate yes or no below with the drop down menu. No

3 Drug-Free Workplace

Whenever two or more bids which are equal with respect to price, quality, and service are received for the procurement of commodities or contractual service, a bid received from a business that certifies that it has implemented a Drug-free Workplace Program shall be given preference in the award process. If bidder's company has a Drug-free Workplace Program as outlined in General Conditions, section 32., indicate that by selecting yes in the drop down menu.

Yes

4 Local Business Participation Percentage

If you have indicated local business participation on the Local Business Participation Form Exhibit A enter the percentage of the contract that will be performed by local Pompano Beach businesses.

10%

5 Vendor Certification Regarding Scrutinized Companies Lists (Any Dollor Amount)

Section 215.4725, Florida Statutes, prohibits agencies from contracting (at any dollar amount) with companies on the Scrutinized Companies that Boycott Israel List, or with companies that are engaged in a boycott of Israel. As the person authorized to electronically sign on behalf of Respondent, I hereby certify by selecting the box below that the company responding to this solicitation is not listed on the Scrutinized Companies that Boycott Israel List. I also certify that the company responding to this solicitation is not participating in a boycott of Israel, and is not engaged in business operations in Syria or Cuba. I understand that pursuant to sections 287.135 and 215.4725, Florida Statutes, the submission of a false certification may subject company to civil penalties, attorney’s fees, and/or costs. Select yes for Agree, No for disagree on the drop down menu.

Yes

6 Terms & Conditions

Check the box indicating you agree to the terms and conditions of this solicitation.

Agree

7 Acknowledgement of Addenda

Check this box to acknowledge that you have reviewed all addenda issued for this solicitation.

Yes

Supplier Award

E-04-20 Addendum 4

Master Plan Update, Design and Consulting Services for

Award Date: 7/28/20

Carollo Engineers Inc.

Contact Information

Contact: Jeff English
Address: Purchasing
1190 NE 3rd Avenue
Building C
Pompano Beach, FL 33060
Phone: (954) 786-4098
Fax: (954) 786-4168
Email: purchasing@copbfl.com

Carollo Engineers Inc.

Contact: Elizabeth Fujikawa
Address: 2728 North University Drive
Coral Springs, FL 33065
Phone: (954) 837-0030
Email: efujikawa@carollo.com

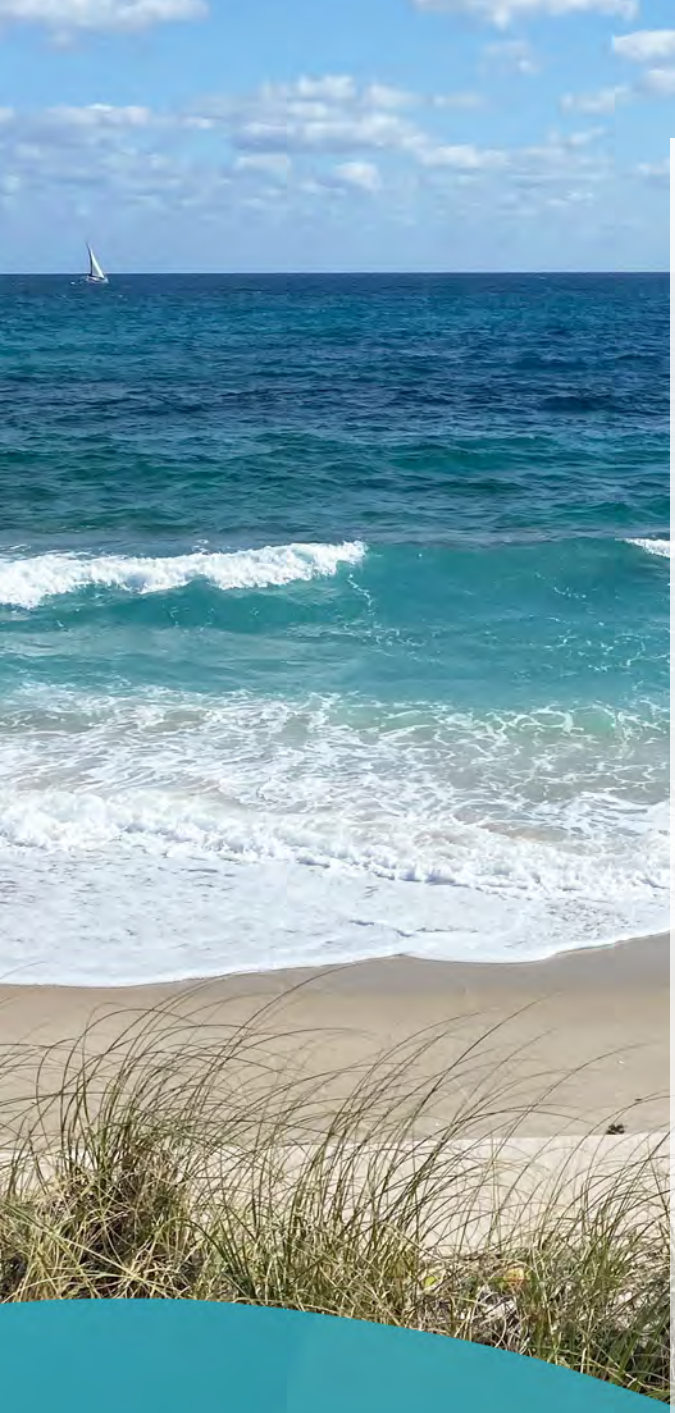
CITY OF POMPANO BEACH

Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System

QUALIFICATIONS // E-04-20 // FEBRUARY 2020

carollo

Engineers...Working Wonders With Water®



Title Page

PROJECT NAME
Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System

PROJECT NUMBER
E-04-20

NAME OF THE PROPOSER'S FIRM
Carollo Engineers, Inc.

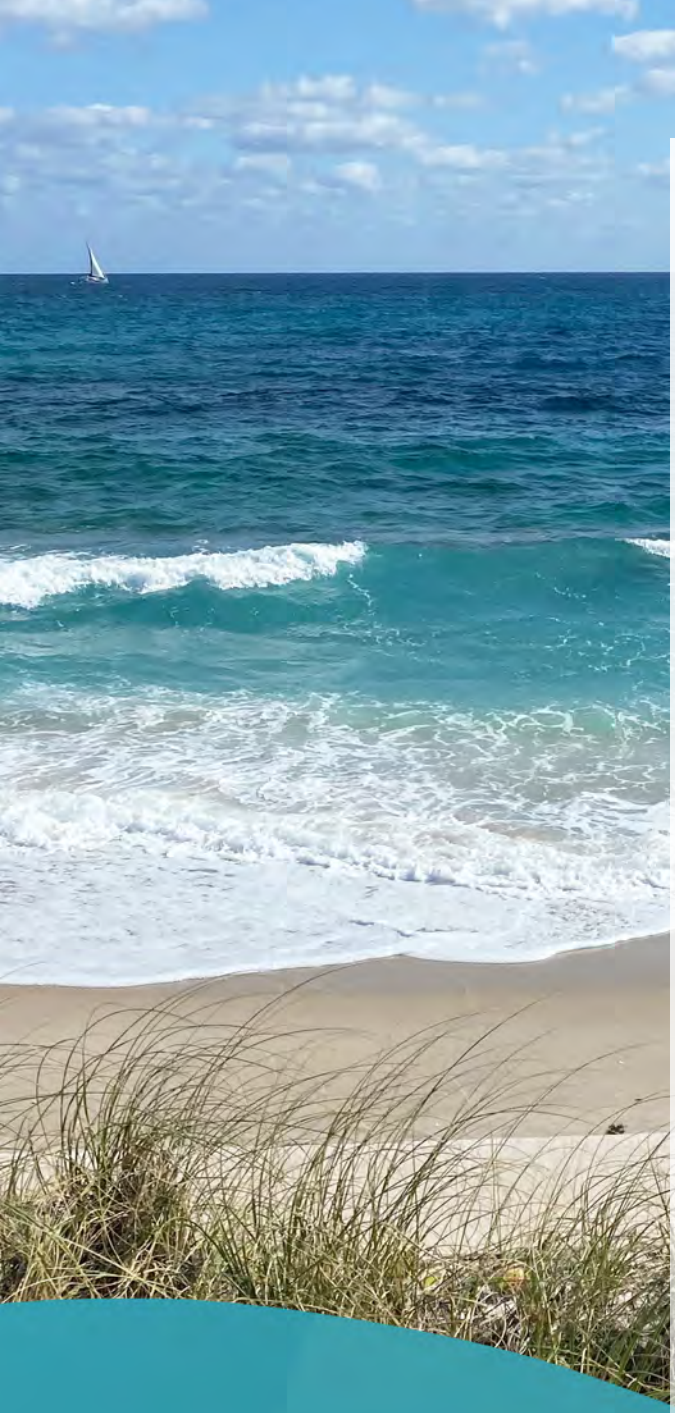
ADDRESS
2728 North University Drive, Building 2700
Coral Springs, Florida 33065

PHONE NUMBER
954-837-0030

NAME OF CONTACT PERSON
Liz Fujikawa, PE, LEED AP, BCEE
Principal-in-Charge

DATE
February 20, 2020

carollo
Engineers...Working Wonders With Water®



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[Sample Electrical Master Plan]

carollo

Engineers...Working Wonders With Water®

Engineers...Working Wonders With Water®

2728 North University Drive, Building 2700, Coral Springs, Florida 33065
P. 954.837.0030 F. 954.837.0035

February 20, 2020

City of Pompano Beach
Purchasing Office
1190 N.E. 3rd Avenue, Building C (Front)
Pompano Beach, FL 33060

Subject: Request for Qualifications E-04-20 Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5kV Electrical System

Dear Selection Committee Members:

For your 2012 Electrical Master Plan, we demonstrated the value of innovative, cost-saving thinking, providing the City with significant capital savings while increasing redundancy and reliability for an aging equipment system. This Master Plan Update project will be critical for your long-term operations—the decisions made now will affect the City for years to come.

The City needs a consulting team deeply committed to finding and implementing the best solution for an aging electrical system, one that addresses both short- and long-term needs. This team must be committed to finding and implementing lasting solutions and must be driven to think creatively, implement innovative ideas, and create proven designs ideally suited to your needs. We are that team, offering the following key features and benefits:

- **A Partnership with the City.** We have worked for the City on numerous projects over the past eight years, allowing us to work in true partnership with your staff to promptly and creatively solve your needs. We are proven throughout Florida and have successfully completed local projects for you and others, such as Margate, Boynton Beach, Delray Beach, Sunrise, Palm Beach County, Miami-Dade County, and the South Florida Water Management District.
- **No Learning Curve.** We have worked on nearly every portion of your treatment facilities. That knowledge will allow us to start work right away, without delay for data requests, reviews, site visits, etc.
- **Designs that Yield Reliable, Maintainable, and Safe Facilities.** Carollo provides only water- and wastewater-related services. Because of this singular focus, we refine our ideas each day, providing clients with facilities that are more reliable, maintainable, and safe to use.
- **Exceeding Schedule and Budget Expectations.** We know your facilities, and our team members have no learning curve, meaning we waste no time learning about you and your needs. We recently completed the procurement documents and process for the South Florida Water Management District's L-8 Reservoir, Pump Station, and Inflow Structure 9 months ahead of their 18-month schedule. Furthermore, our capital cost estimating experience will yield "no surprises" and no delay at bid time.

As required in the Request for Qualifications, we have provided corporate information below:

Complete Corporate Name: Carollo Engineers, Inc.
Federal Tax Identification Number: 86-0899222
Carollo Headquarters Address: 2700 Ygnacio Valley Road, Suite 300, Walnut Creek, CA 94598
Corporate Phone and Fax Numbers: (925) 932-1710 | (925) 930-0208
Local Office Address: 2728 North University Drive, Building 2700, Coral Springs, FL 33065
Local Office Phone and Fax Numbers: (954) 837-0030 | (954) 837-0035
Point of Contact Regarding this Submission:

Elizabeth (Liz) Fujikawa, PE, LEED AP, BCEE
Vice President/Principal-in-Charge
Ph: (954) 837-0030 | efujikawa@carollo.com

Our entire team looks forward to the opportunity to work with the City on this project.

Sincerely,

CAROLLO ENGINEERS, INC.

Elizabeth Fujikawa, PE, LEED AP, BCEE
Vice President/Principal-in-Charge

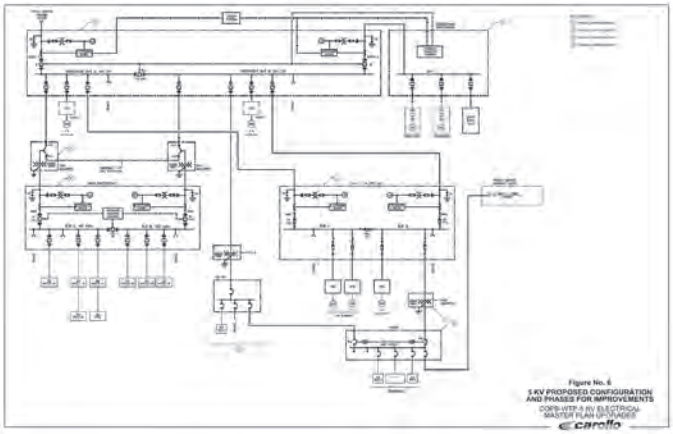
We acknowledge receiving Addendums #1-4.

1. Technical Approach

Our proposed approach builds on our previous work and includes innovative ideas that result in an Electrical Master Plan and improvements that will stand the test of time.

The Pompano Beach Water Treatment Plant (WTP) provides drinking water to City residents and businesses. It is critical that the WTP remain in continuous operation, even under extreme conditions such as power outages and tropical storms. As a result, it is essential that the electrical system is highly reliable to keep treatment processes and pumping systems in operation and energy efficient to reduce operating costs. In 2012, Carollo and Gamboa Engineers assessed the electrical system and found that the majority of the power distribution system in the lime softening plant was near the end of its useful life and needed a significant upgrade to maintain a reliable and safe power distribution system.

The project objectives are to increase the reliability of the power distribution system for the water treatment plant by not only electrical equipment replacement, but also incorporating state-of-the-art technology, and redesigning the system to provide additional redundancy and prevent single points of failure. The Carollo team will use our substantial knowledge of the plant to partner with City staff to deliver a long-lasting electrical system that meets current goals and future expansions, including capital budget constraints and cash flow needs. Then the Carollo team will document the work through an updated Electrical Master Plan.



Carollo's extensive knowledge of the City's electrical system is shown in our 2012 Electrical Master Plan.

Carollo has worked on nearly every part of the Pompano Beach WTP, located at 1205 NE 5th Ave.

PROPOSED PHASES OF WORK: WE HAVE A DRAFT PLAN TO COMPLETE YOUR IMPROVEMENTS

The electrical improvements identified in the original Electrical Master Plan are grouped into six phases, as outlined below. The improvements included in this project are in Phases III, IV, V, and VI, as highlighted in red in the table. The phases are not necessarily in the order of construction.

Phases of Work in the Electrical Master Plan

Phase	Description	Work Completed to Date	Work to be Completed
I	5 kV Improvements at HSP 1-4 Building	Construction Complete*	None
II	Switchboard and Transformer at HSP 1 - 4 Building	Construction Complete*	None
III	Renovation of HSP 5-6 Building	None	New Electrical Room and Building Upgrades
IV	5 kV Improvements at HSP 5-6 Building	None	5 kV Improvements
V	Substations TU-1, TU-2, and TU-3 Improvements**	Transfer Pump Station Construction in Progress*	TU-1, TU-2 and TU-3 Improvements, including a New Electrical Building
VI	Miscellaneous Improvements	Membrane Feed Pump VFD Replacement* UFO Facility Power Supply*	MCC Assessment Ancillary Electrical and Water System Improvements

* Design and construction administration provided by Carollo and Gamboa Engineers

** The Transfer Pump Station improvements are currently under construction with a projected completion date of August 2020.

The Phase I and II improvements were successfully completed in 2014 and 2016, with the design and construction administration by Carollo and Gamboa Engineers. The new electrical systems have greatly increased reliability, longevity, and energy efficiency for the High Service Pump (HSP) 1 - 4 Building.

Construction of Phases I and II Electrical Improvements were successfully completed by our proposed project team.

We have a draft plan for the remainder of the improvements necessary to complete the work, and of course, this will be reviewed with the City for consensus. The draft plan is highlighted below by phase. The order of work will be modified during design to create a logical sequence of construction.

PHASE III IMPROVEMENTS: BRINGING HSP 5-6 BUILDING INTO THE 21ST CENTURY

The goal of the Phase III improvements is to prepare the HSP 5-6 Building for the replacement of electrical equipment in Phase IV.

To achieve this goal, the following improvements are included in the Phase III work:

- **Repurpose the FPL vault/room to a new electrical room.** The new room will provided the needed space for new electrical equipment. Having the new equipment in a separate room allows for the demolition of existing aged equipment in the existing electrical room with minimal impact to plant operations.
- **Modify the existing HVAC, plumbing, fire protection, and lighting systems to bring the building up to code.**
- **Assess upgrades to the two pumps and the engine drive.** Previous designed hurricane hardening and access control features will be incorporated into the design.
- **Relocate and replace the existing indoor 5-kV to 480-volt transformer and switchboard in the pump room, since it is at the end of its useful life.** Design switchboard with dual breakers to facilitate periodic inspection and maintenance.

The existing FPL vault will be converted into an electrical room.

All aspects of the HSP 5-6 Building will be considered for renovation with the goal of making it as safe and reliable as possible.

A substation transformer will be installed outside the HSP 5-6 Building.

PHASE IV IMPROVEMENTS: ADDING STATE-OF-THE-ART SWITCHGEAR AND PANELS

Phase IV improvements will replace the majority of 5-kV electrical equipment in the HSP 5-6 Building. This includes upgrading the critical 5-kV switchgear, which distributes power to the majority of the lime softening treatment and pumping facilities. This alone will significantly increase the reliability of the water treatment plant.

The following improvements are included in Phase IV:

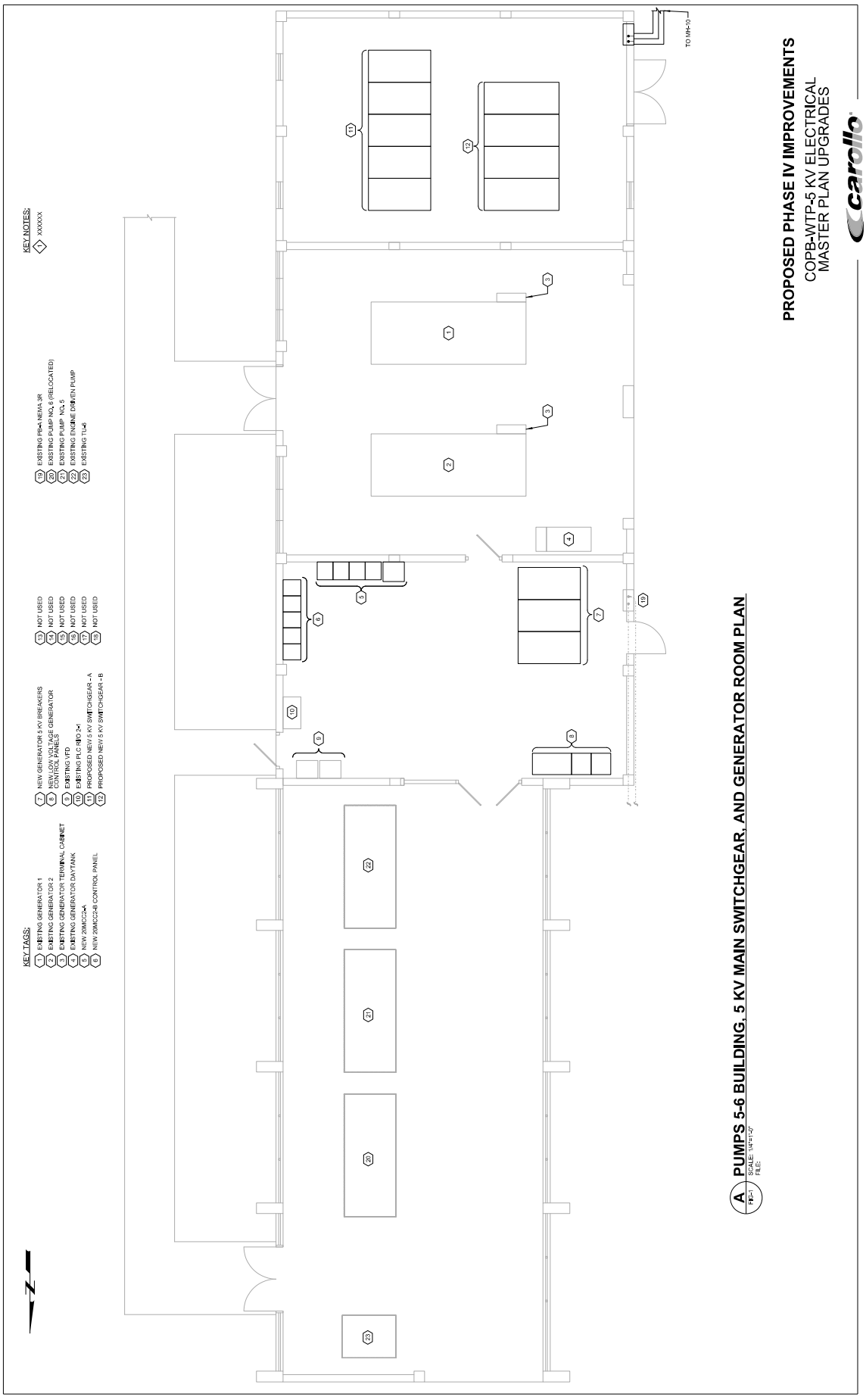
- **Replace the 5-kV starters for high service pumps 5 and 6** with 600-HP VFDs.
- **Replace the 480-volt motor control center in the main electrical room with two sources of power supply breakers and a tie-breaker for isolation of half of the MCC.** The ability to isolate either half of the MCC will increase reliability, add flexibility for maintenance, and reduce the magnitude of shut-down for making future connections.
- **Replace the existing main 5-kV switchgear, which acts as the backbone of the power distribution system.**
- **Relocate the low voltage controls for the two standby generators.** The control cabinets are to be separated from the 5-kV equipment, to minimize the risks of arc flash hazards.
- **Coordinate with FPL for replacement of existing power supply transformers with new City-owned outdoor substation transformers.**

The proposed modifications in Phase IV will significantly increase the reliability of the water treatment plant

Exterior 5-kV switches to be removed.

Example of separate low-voltage control cabinets for synchronizing generators.

Example of a 5-kV switchgear design, which will replace the existing obsolete main switchgear in the Pumps 5-6 building.



A possible layout of the new electrical equipment in HSP 5-6 Building.

PHASE V IMPROVEMENTS: A NEW ELECTRICAL BUILDING!

The Phase V improvements will:

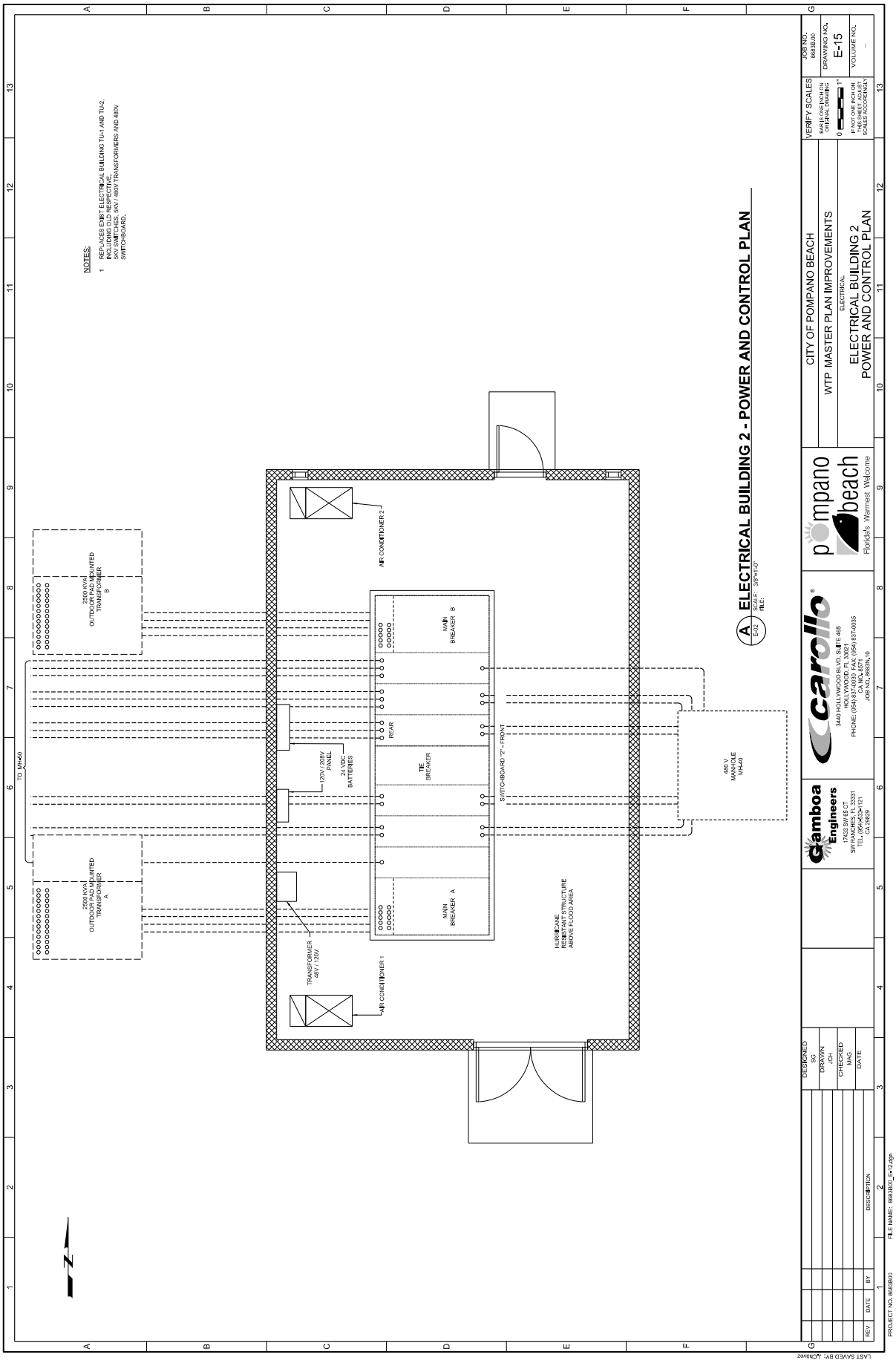
- Upgrade the power distribution system in Electrical Building TU-1.
- Upgrade the power distribution system in Electrical Building TU-2.
- Provide new power feeders to the Transfer Pump Station.

The Transfer Pump Station improvements are currently under construction with a projected completion date of August 2020. Carollo and Gamboa Engineers performed the design and are now doing the construction administration of these improvements.

The remaining work to be completed under this project is summarized as follows:

- **Remove the existing indoor 5-kV switches in each Electrical Building (TU-1 and TU-2).**
- **Remove the indoor 5-kV/480-volt transformers in Electrical Buildings TU-1 and TU-2, and replace them with two outdoor pad-mounted transformers located adjacent to Electrical Building TU-2.** This will reduce the indoor heat load and provide space in the Electrical Buildings for additional electrical improvements.
- **Replace the existing building with a taller structure that has ample space and air conditioning.** The existing Electrical Building TU-2 was constructed with prefabricated wall panels and it has minimum overhead clearances.
- **Remove the 480-volt switchboards in Electrical Buildings TU-1 and TU-2, and replace them with a single double-ended 480-volt switchboard that supplies power to the transfer pumps, chemical building, and dewatering building.** The new switchboard is to be located in the new electrical building with ideal conditions for regular maintenance, thereby ensuring a reliable power distribution system for the lime softening treatment facilities.
- **Review the design of the new electrical building with City staff to determine if additional rooms are desired, such as a bathroom, lab room, or storage room.** Environmentally responsible and resource-efficient design features will also be considered.
- **Perform geotechnical borings and topographical surveying as part of the building design work.**

Example of a 480-v switchgear design with a center tie-breaker to provide redundancy.



Conceptual layout of the new electrical building. The Carollo team is ready to review the layout with the City and rapidly advance the design.

PHASE VI IMPROVEMENTS: MODERNIZING ELECTRICAL SYSTEMS ACROSS THE ENTIRE PLANT

- **Assess the existing 480-volt motor control centers (MCCs) throughout the lime softening treatment facilities.** Most of the MCCs were installed in the 1980s and are near the end of their useful life. Carollo and Gamboa Engineers will present the results of the assessment to City staff and identify the upgrades to be completed as part of this project.
- **Upgrade and replace aged MCC equipment to increase safety and reliability.** In general, new MCCs should consist of a double-ended scheme with two sources of input power and a tie circuit breaker, for convenience to isolate half of the MCC for periodic inspection or maintenance.
- **Update the Electrical Master Plan document as each phase of the work is completed.** The Carollo team will meet with City staff to review the progress of work and identify additional electrical and controls improvements to be incorporated.
- **Complete the designs and provide construction administration for the miscellaneous electrical improvements identified from the assessment of MCCs and updates to the Electrical Master Plan.**

MCC at Dewatering Building is in need of upgrades.

WHAT ARE THE BENEFITS TO OUR APPROACH?

ACHIEVING LASTING RELIABILITY THROUGH THOUGHTFUL DESIGN

The approach to your electrical system design will have lasting impacts on the WTP for at least the next 20 years. Good design choices will be celebrated by plant staff nearly every day of successful operation. The Carollo design team will focus on maximizing reliability for all systems that support the water treatment facilities. This will be achieved with the following design features:

- Expedite revisions to electrical master plan and design based on Carollo/Gamboa Engineers' substantial knowledge of the existing water treatment plant.
- Comply with NFPA-70E standard for electrical safety in the workplace.
- Have the ability to isolate breakers and panels with minimal impact to critical facilities.
- Provide multiple sources of power to major electrical facilities, per EPA Class I Reliability Guidelines.
- Make standby power available from the two diesel engine generators.
- Provide adequate space for operation and maintenance of equipment.
- Provide spare conduits and empty MCC buckets for ease of future installations.

Redundant air conditioning units designed by Carollo.

New redundant air handler units designed by Carollo with features to control humidity in electrical rooms and increase electrical equipment reliability.

*"Water system reliability is **absolutely essential.**"*

— EPA Drinking Water Handbook

MEETING BUDGET AND SCHEDULE THROUGH COST AND SCHEDULE CONTROL

Cost Control

The Carollo team is committed to being good stewards of the City's resources by minimizing the costs associated with the electrical improvements. To control cost, the following measures will be implemented:

- Carollo will hold a value engineering workshop with the City and key staff during the preliminary design phase. The scope of the improvements and initial cost estimate will be reviewed. Design alternatives will be presented along with associated costs in order to make financially responsible decisions early in the project.
- Accurate cost estimates will be produced under the direction of the project manager and with input from staff from each discipline. Prices will be obtained from equipment suppliers and from cost databases such as ENR magazine, the Handy Whitman Water Utilities Index, and RS Means.
- Carollo believes in listing multiple equipment suppliers to achieve a competitive price. Carollo staff will reach out to each supplier for pricing, to gain feedback on potential alternative approaches, and to confirm the best technology is being selected for the application.

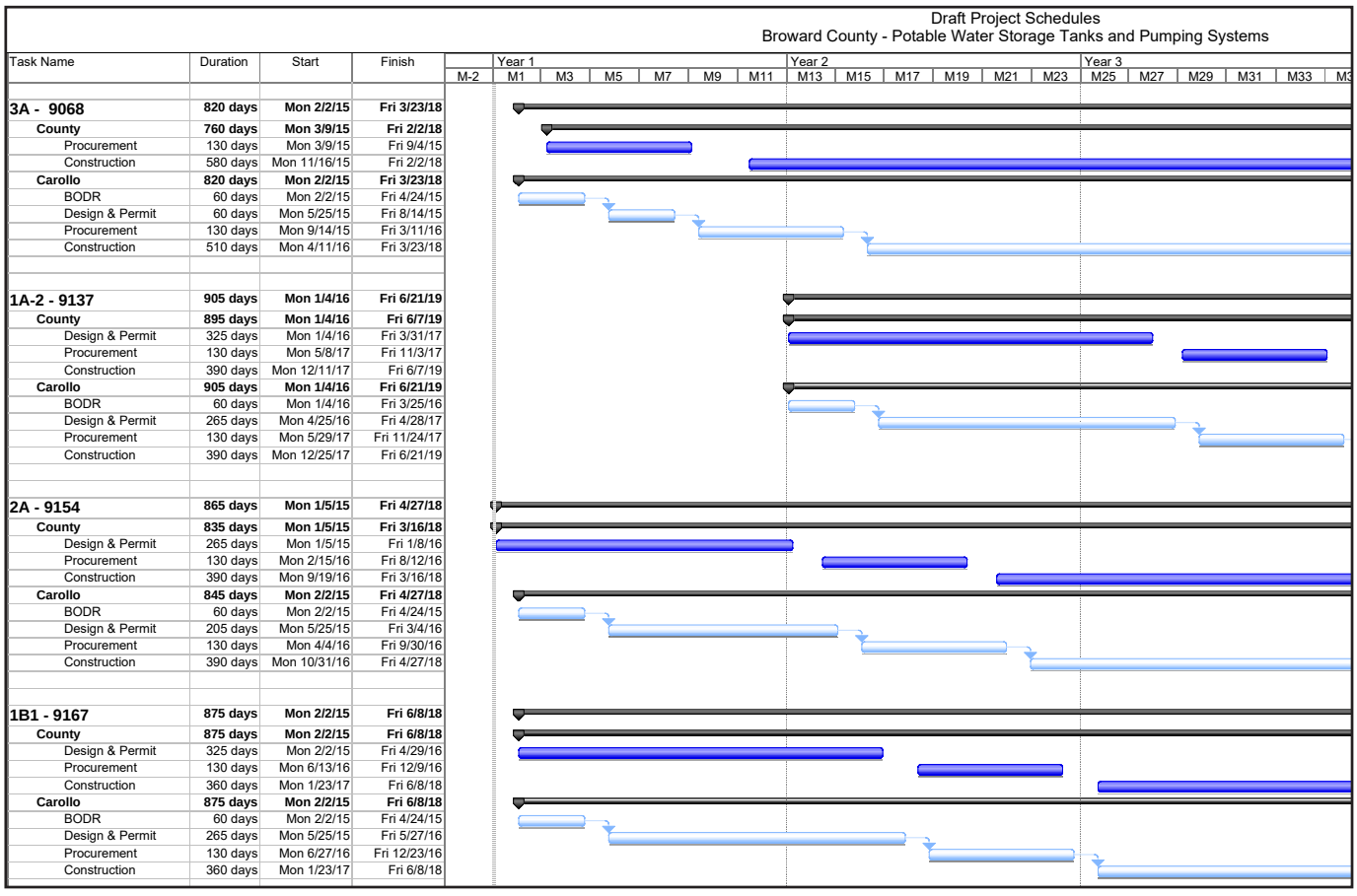
We previously identified significant cost savings for replacing the electrical equipment in the HSP 5-6 Building. The electrical room is too small for the proposed improvements; however, rather than constructing a new electrical building, we identified the alternative of expanding the existing electrical room. This will save an estimated $200,000 to $300,000. We will continue this approach to finding creative cost-saving alternatives.

Schedule Control

Carollo is committed to driving the project forward to complete these upgrades in accordance with an agreed timeline. An overall schedule will be developed, including draft and final deliverables for the work identified in each phase. Milestone dates will be identified, along with a critical path. Carollo can be trusted to complete deliverables by the agreed dates.

The project manager will take an active approach in managing team members to complete tasks in a timely manner. Regular communication will take place with discipline staff, City staff, permit agencies, and the contractor.

Carollo will include intermediate milestones in the construction contract documents, in addition to overall substantial completion. These milestones will help ensure the contractor is actively working throughout the construction period. The contractor's initial schedule will be reviewed in detail by Carollo. Progress schedules will also be reviewed monthly.



Task Name	Duration	Start	Finish
3A - 9068	**820 days**	**Mon 2/2/15**	**Fri 3/23/18**
County	**760 days**	**Mon 3/9/15**	**Fri 2/2/18**
Procurement	130 days	Mon 3/9/15	Fri 9/4/15
Construction	580 days	Mon 11/16/15	Fri 2/2/18
Carollo	**820 days**	**Mon 2/2/15**	**Fri 3/23/18**
BODR	60 days	Mon 2/2/15	Fri 4/24/15
Design & Permit	60 days	Mon 5/25/15	Fri 8/14/15
Procurement	130 days	Mon 9/14/15	Fri 3/11/16
Construction	510 days	Mon 4/11/16	Fri 3/23/18
1A-2 - 9137	**905 days**	**Mon 1/4/16**	**Fri 6/21/19**
County	**895 days**	**Mon 1/4/16**	**Fri 6/7/19**
Design & Permit	325 days	Mon 1/4/16	Fri 3/31/17
Procurement	130 days	Mon 5/8/17	Fri 11/3/17
Construction	390 days	Mon 12/11/17	Fri 6/7/19
Carollo	**905 days**	**Mon 1/4/16**	**Fri 6/21/19**
BODR	60 days	Mon 1/4/16	Fri 3/25/16
Design & Permit	265 days	Mon 4/25/16	Fri 4/28/17
Procurement	130 days	Mon 5/29/17	Fri 11/24/17
Construction	390 days	Mon 12/25/17	Fri 6/21/19
2A - 9154	**865 days**	**Mon 1/5/15**	**Fri 4/27/18**
County	**835 days**	**Mon 1/5/15**	**Fri 3/16/18**
Design & Permit	265 days	Mon 1/5/15	Fri 1/8/16
Procurement	130 days	Mon 2/15/16	Fri 8/12/16
Construction	390 days	Mon 9/19/16	Fri 3/16/18
Carollo	**845 days**	**Mon 2/2/15**	**Fri 4/27/18**
BODR	60 days	Mon 2/2/15	Fri 4/24/15
Design & Permit	205 days	Mon 5/25/15	Fri 3/4/16
Procurement	130 days	Mon 4/4/16	Fri 9/30/16
Construction	390 days	Mon 10/31/16	Fri 4/27/18
1B1 - 9167	**875 days**	**Mon 2/2/15**	**Fri 6/8/18**
County	**875 days**	**Mon 2/2/15**	**Fri 6/8/18**
Design & Permit	325 days	Mon 2/2/15	Fri 4/29/16
Procurement	130 days	Mon 6/13/16	Fri 12/9/16
Construction	360 days	Mon 1/23/17	Fri 6/8/18
Carollo	**875 days**	**Mon 2/2/15**	**Fri 6/8/18**
BODR	60 days	Mon 2/2/15	Fri 4/24/15
Design & Permit	265 days	Mon 5/25/15	Fri 5/27/16
Procurement	130 days	Mon 6/27/16	Fri 12/23/16
Construction	360 days	Mon 1/23/17	Fri 6/8/18

Example overall schedule with multiple phases.

AVOIDING DELAY BY PROVEN PERMITTING EXPERIENCE

When it comes to obtaining complex environmental and building-related permits, the Carollo team has a reputation of efficiently obtaining the required permits and effectively negotiating reasonable permit conditions. This outcome is achieved by the following approach:

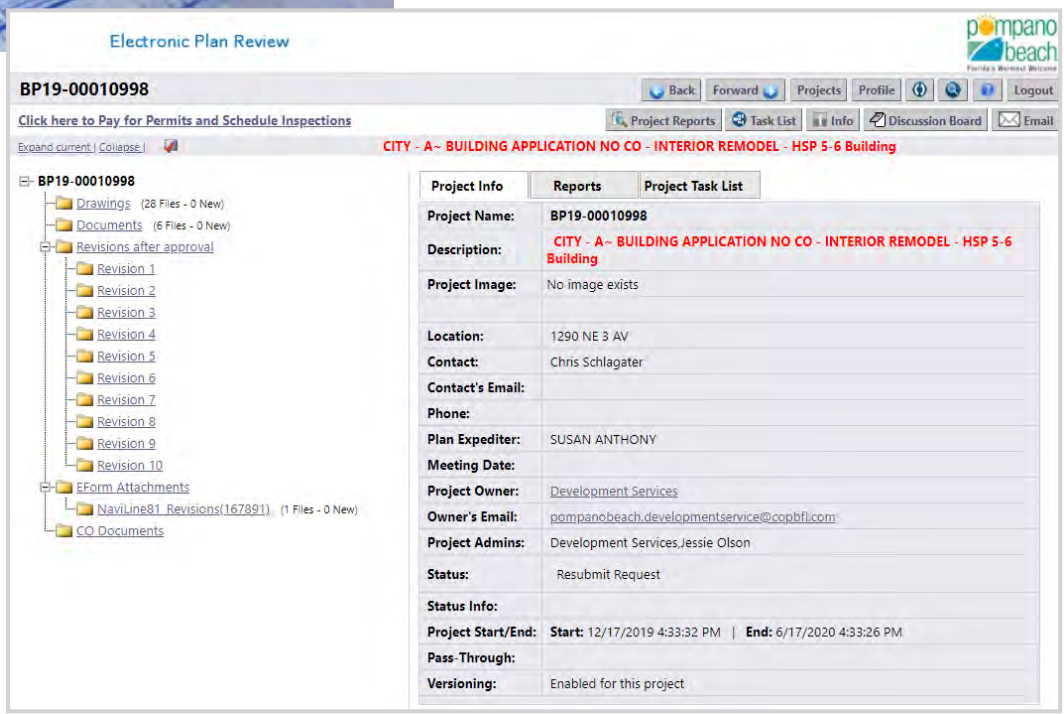
- **Early Involvement of the Regulatory Agency.** Carollo has demonstrated on previous City projects that early regulatory agency involvement and clear communication prevent surprises during the project's later stages.
- **Establishing a Level of Trust.** Through our past work with the City and regulatory agencies, our team has established a solid reputation of trust and a spirit of cooperation, not confrontation.
- **Open Lines of Communication.** We believe in open communication with regulators to advise them of project changes and developments. If the project's design or schedule changes, this communication is important so accommodations can be made ahead of time.

The anticipated permits for this project are as follows:

- **Department of Environmental Protection (DEP):** Specific Permit to Construct PWS Components and National Pollutant Discharge Elimination System (NPDES) Permit (in coordination with the contractor).
- **Broward County Environmental Protection and Growth Management Department (EPGMD):** Surface Water Management License Modification, Environmental Review Approval, and Transportation Concurrency.
- **City of Pompano Beach Planning and Zoning Department:** Development Review Committee (DRC) Approval and Architectural Appearance Committee (AAC) Approval.
- **City of Pompano Beach Building Department:** Dry Run Review Comments, Landscaping Approval, and Construction Permit (in coordination with the contractor).

Regulatory review comments on projects to date have been minimal, were quickly addressed, and did not require significant rework (thus keeping the project on schedule and budget).

ePlan website with review comments for a Carollo project.



MINIMIZING RATE INCREASES: SRF FUNDING SUPPORT

Selecting a team with in-depth knowledge of the funding application process, a solid understanding of the project the City is seeking to implement, the ability to identify merits that improve a project's chance of loan award, and strong relationships with Florida Department of Environmental Protection (FDEP) staff will best position the City for a Drinking Water State Resolving Fund (DWSRF) loan. Securing a DWSRF loan is an important component of the Project's implementation, as it offers low-interest rates that will save the City in financing costs and enable the project to move forward.

Carollo's recent success in guiding our clients through the SRF application process means we know what to prioritize to make sure you get your funding agreement in a timeline manner. This effort will include evaluating your project to identify application readiness and identifying potential project enhancements (e.g. energy or water efficiency aspects, environmental improvements, etc.) to increase the project's priority score in order to increase a project's chance for award. We will work with the City to develop and submit the required documentation, including the Request for Inclusion Form, Facility Plan, Site Certification, and Plans/Specifications, in a timely manner to ensure a highly competitive and complete SRF application is delivered to FDEP.

In the last 5 years, Carollo has had great success securing grants and loans for our clients, including $110 million in grants, $400 million in SRF loans.

Carollo will provide the City with:

- Individuals with SRF loan application experience as well as experience in water and infrastructure design.
- A team who has recently completed SRF loan applications for projects of similar size and complexity and has successfully secured over $400 million in SRF funding.
- Guidance in providing the financial backing that is critical to securing the loan.
- Strong leadership with staff who bring extensive knowledge of bridging the gap between planning, design, and construction and know how to keep your SRF funding efforts on track.

Carollo recently supported Bay County Utilities Services in securing SRF funding for three of its projects.

Selecting a team with in-depth knowledge of the funding application process, a solid understanding of the project you are planning to implement; the ability to identify merits that improve a project's chance of loan award, and solid relationships with FDEP will best position the City for a DWSRF loan. In addition, as requested, Carollo can evaluate the availability of other sources of grant or low interest financing to complement the SRF program.

CONSTRUCTION SERVICES: MANAGING SCHEDULE, BUDGET, AND INSTALLATION

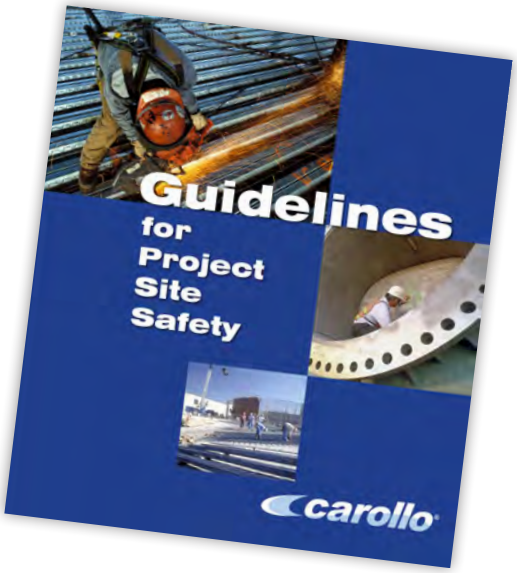
The Carollo team has the staff and experience to help bring the design to reality in a seamless manner. Our philosophy for construction services is:

- Ensure that the City gets what it paid for, which is a quality end product.
- Deliver a smooth transition from design to construction to startup to continued operation.
- Minimize shut-downs associated with tie-ins of new components.
- Protect the City from costly change orders during construction.
- Prevent claims after construction is completed.

Risk management on behalf of the City is the central theme of our construction administration services. We will actively serve to protect the interests of the City through the bidding and construction period.

Regular communication is an essential part of every successful construction project. Carollo will support open lines of communication between the City, the construction contractor, and other stakeholders. To move the project forward and resolve outstanding issues, the Carollo Team will schedule regular progress meetings. As our previous work demonstrates, our team members will also be available for impromptu meetings in the field.

Our team is very familiar with the City's approach to staffing utility department construction projects. We will provide qualified onsite personnel as required to oversee construction activities. Multi-discipline inspections will take place to review the installed work and help ensure it meets the specified quality.



Carollo has produced guidelines for project site safety, which include do's and don'ts on the job site.

Conflicts and delays often occur during construction. As issues arise, our team will focus on solutions instead of blame. We will quickly develop potential solutions, present a recommendation to the City, and help move the project forward. Our team has the tools and skills to manage conflicts and changes in an efficient manner.

Where possible, changes that affect ongoing construction will be resolved at the field level. Changes that include cost adjustments will be addressed as soon as possible to minimize additional cost and schedule impacts.

All construction activities must lead to successful commissioning and startup. We will work closely with operations staff, the contractor, and equipment suppliers to minimize the challenges during startup. Having our experienced project team, which is knowledgeable about the treatment processes, will result in superior startup and commissioning. The submittal process, witnessing of testing, and operator training are just a few examples of how our team will support the City's goal of increasing reliability of the Pompano Beach WTP.

A Carollo engineer performing inspections for a substantial completion punch list.

2. Schedule

The Carollo Team understands the need to keep this project on schedule.

On the following page, we have provided an overall schedule for the Electrical Master Plan Update Project. The project starts with preparing a revised Electrical Master Plan for the improvements identified in Phases III, IV, V, and VI, as summarized in *Section 1. Technical Approach*. A workshop will be held with key staff from the Carollo team and the City. After agreement on a path forward, the SRF funding application will be submitted and detailed design will begin. Note that Carollo and Gamboa Engineers have already prepared preliminary drawings for most of the identified work and thus the 60 percent drawings and specifications can be produced quickly and efficiently.

After 100 percent design is complete, submittals will be made to permit agencies and to advance the SRF loan. A final quality review will be performed prior to bidding. After award, Carollo will assist the City to finalize the SRF loan. Construction is estimated at 23 months (500 working days). The construction work will include the startup of various new electrical components in separate phases. An overall commissioning period is identified to take place in early 2024. This projection will be revised as the project progresses.

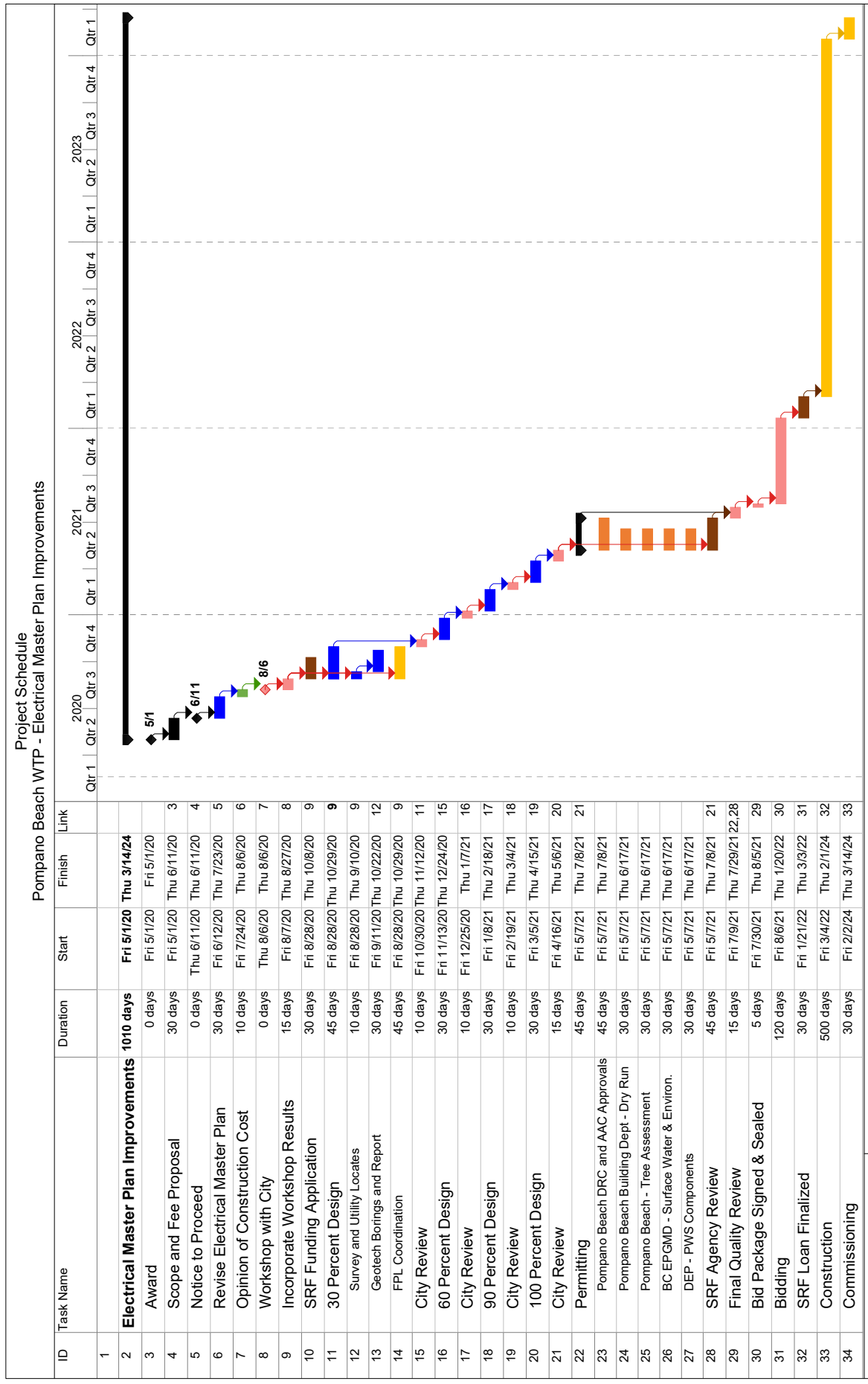
Shown below are past City projects that we have completed while maintaining the schedule.

Demonstrated Ability to Complete City Projects within Budget and On Time

Project	Role	Contract Budget	Final Budget	Key Deliverable	Deliverable on Time?
Concentrate Pipeline Assessment	Prime	$13,500	$13,500	Technical Memorandum	Yes
Design of Membrane Concentrate Pipeline	Prime	$46,859	$46,859	Construction Documents	Yes
Electrical Master Plan - Phases I and II, and Design	Prime	$222,995	$227,995	Technical Memorandum	Yes
Lime versus Nanofiltration Water Treatment Plant Evaluation	Prime	$51,845	$51,845	Technical Memorandum	Yes
Concentrate Blending Study	Prime	$24,983	$24,983	Technical Memorandum	Yes
Electrical Master Plan Misc Design/Construction Services	Prime	$198,000	$198,000	Construction Documents	Yes
Power Supply for the UFO Office	Prime	$26,600	$26,600	Construction Documents	Yes
Reuse Treatment Plant Permit Renewal	Prime	$59,264	$59,264	Permit Submittal	Yes
Transfer Pump Station - Additional Services	Prime	$33,500	$33,500	Technical Memorandum	Yes
Water Master Plan	Prime	$197,866	$197,866	Master Plan Report	Yes
Water Supply Facilities Work Plan 2018 Update	Prime	$66,046	$66,046	Work Plan Report	Yes
WTP Transfer Pump Station Improvements	Prime	$99,707	$99,707	Construction Documents	Yes
Hurricane Hardening of HSP 5-6 Building	Prime	$71,500	$71,500	Construction Documents	Yes

Project Schedule
Pompano Beach WTP - Electrical Master Plan Improvements

ID	Task Name	Duration	Start	Finish	Link
1					
2	**Electrical Master Plan Improvements**	**1010 days**	**Fri 5/1/20**	**Thu 3/14/24**	
3	Award	0 days	Fri 5/1/20	Fri 5/1/20	
4	Scope and Fee Proposal	30 days	Fri 5/1/20	Thu 6/11/20	3
5	Notice to Proceed	0 days	Thu 6/11/20	Thu 6/11/20	4
6	Revise Electrical Master Plan	30 days	Fri 6/12/20	Thu 7/23/20	5
7	Opinion of Construction Cost	10 days	Fri 7/24/20	Thu 8/6/20	6
8	Workshop with City	0 days	Thu 8/6/20	Thu 8/6/20	7
9	Incorporate Workshop Results	15 days	Fri 8/7/20	Thu 8/27/20	8
10	SRF Funding Application	30 days	Fri 8/28/20	Thu 10/8/20	9
11	30 Percent Design	45 days	Fri 8/28/20	Thu 10/29/20	**9**
12	Survey and Utility Locates	10 days	Fri 8/28/20	Thu 9/10/20	9
13	Geotech Borings and Report	30 days	Fri 9/11/20	Thu 10/22/20	12
14	FPL Coordination	45 days	Fri 8/28/20	Thu 10/29/20	9
15	City Review	10 days	Fri 10/30/20	Thu 11/12/20	11
16	60 Percent Design	30 days	Fri 11/13/20	Thu 12/24/20	15
17	City Review	10 days	Fri 12/25/20	Thu 1/7/21	16
18	90 Percent Design	30 days	Fri 1/8/21	Thu 2/18/21	17
19	City Review	10 days	Fri 2/19/21	Thu 3/4/21	18
20	100 Percent Design	30 days	Fri 3/5/21	Thu 4/15/21	19
21	City Review	15 days	Fri 4/16/21	Thu 5/6/21	20
22	Permitting	45 days	Fri 5/7/21	Thu 7/8/21	21
23	Pompano Beach DRC and AAC Approvals	45 days	Fri 5/7/21	Thu 7/8/21	
24	Pompano Beach Building Dept - Dry Run	30 days	Fri 5/7/21	Thu 6/17/21	
25	Pompano Beach - Tree Assessment	30 days	Fri 5/7/21	Thu 6/17/21	
26	BC EPGMD - Surface Water & Environ.	30 days	Fri 5/7/21	Thu 6/17/21	
27	DEP - PWS Components	30 days	Fri 5/7/21	Thu 6/17/21	
28	SRF Agency Review	45 days	Fri 5/7/21	Thu 7/8/21	21
29	Final Quality Review	15 days	Fri 7/9/21	Thu 7/29/21	22,28
30	Bid Package Signed & Sealed	5 days	Fri 7/30/21	Thu 8/5/21	29
31	Bidding	120 days	Fri 8/6/21	Thu 1/20/22	30
32	SRF Loan Finalized	30 days	Fri 1/21/22	Thu 3/3/22	31
33	Construction	500 days	Fri 3/4/22	Thu 2/1/24	32
34	Commissioning	30 days	Fri 2/2/24	Thu 3/14/24	33



Project No: 300.51 PM001
Author: MNL
Date: Tue 2/18/20

Task
Milestone
Summary

E Master Plan Schedule.mpp

Carollo Engineers

3. Project Team Form

COMPLETE THE PROJECT TEAM FORM ON THE ATTACHMENTS TAB IN THE EBID SYSTEM. PROPOSERS ARE TO COMPLETE FORM IN ITS ENTIRITY AND INCLUDE THE FORM IN YOUR PROPOSAL THAT MUST BE UPLOADED TO THE RESPONSE ATTACHMENTS TAB FOR THE RFQ IN THE EBID SYSTEM.

PROJECT TEAM

RFQ NUMBER E-04-20

Federal I.D.# 86-0899222

PRIME

Role	Name of Individual Assigned to Project	Number of Years Experience	Education, Degrees
Principal-in-Charge	Elizabeth Fujikawa	33	MS Environmental Engineering; BS Chemistry
Project Manager	Mark Ludwigson	18	MS Engineering; BS Engineering Mechanics
Lead Facility Engineer	Mark Ludwigson	18	MS Engineering; BS Engineering Mechanics
Technical Advisor	Bob Cushing	30	PhD/MS Civil Engineering; BS Petroleum Engineering
Technical Advisor	Mark Pellish	34	BS Electrical Engineering

SUB-CONSULTANT

Role	Company Name and Address of Office Handling This Project	Name of Individual Assigned to the Project
Lead Electrical Engineer	Gamboa Engineers, LLC	Mario Gamboa
	17433 SW 65 CT	
	Southwest Ranches, FL 33331	
Lead Building Designer	DK Architects	Andre Capi
	61 NE 1st Street, Suite 2	Blaise McGinley
	Pompano Beach, FL 33060	
Architecture	DK Architects (see address above)	Andre Capi
Site Plan	DK Architects (see address above)	Andre Capi
Permitting	DK Architects (see address above)	Jan Wirt
Surveying	Compass Point Surveyors, PL	Benjamin Wiser
	3195 N. Powerline Road #112	
	Pompano Beach, Florida 33069	
Geotechnical	Quest Engineering Services & Testing, Inc.	R.N. Sailappan
	2737 NW 19th St.	
	Pompano Beach, FL 33069	

4. Organizational Chart

Carollo delivers services to our clients with a passion for success.

We have combined local and national resources from Carollo, Gamboa Engineers, DK Architects, Compass Point Surveyors, and Quest Engineering to develop a roster of specialized expertise in electrical master planning that is a direct match to your project requirements.

KEY TEAM MEMBERS

As shown in the organizational chart below, Carollo's team will be led by our Project Manager/Lead Facility Engineer, Mark Ludwigson; Principal-in-Charge, Liz Fujikawa; Lead Electrical Engineer, Mario Gamboa; and Technical Advisors, Bob Cushing and Mark Pellish.

Project Manager/Lead Facility Engineer

Mark Ludwigson, PE

Mark has over 18 years of experience and has worked solely in the water environment industry since 2004. He is passionate about water systems and has brought success to a variety of water projects, whether serving as project manager or project engineer. Mark is trusted for civil, mechanical, and process design discipline work.

Mark has worked on projects for the City as well as clients, such as Broward County, Margate, Sunrise, Delray Beach and North Miami Beach.

Mark will serve as the point of contact for the Carollo team. He will be responsible for the day-to-day control of the project and leadership of the project team.

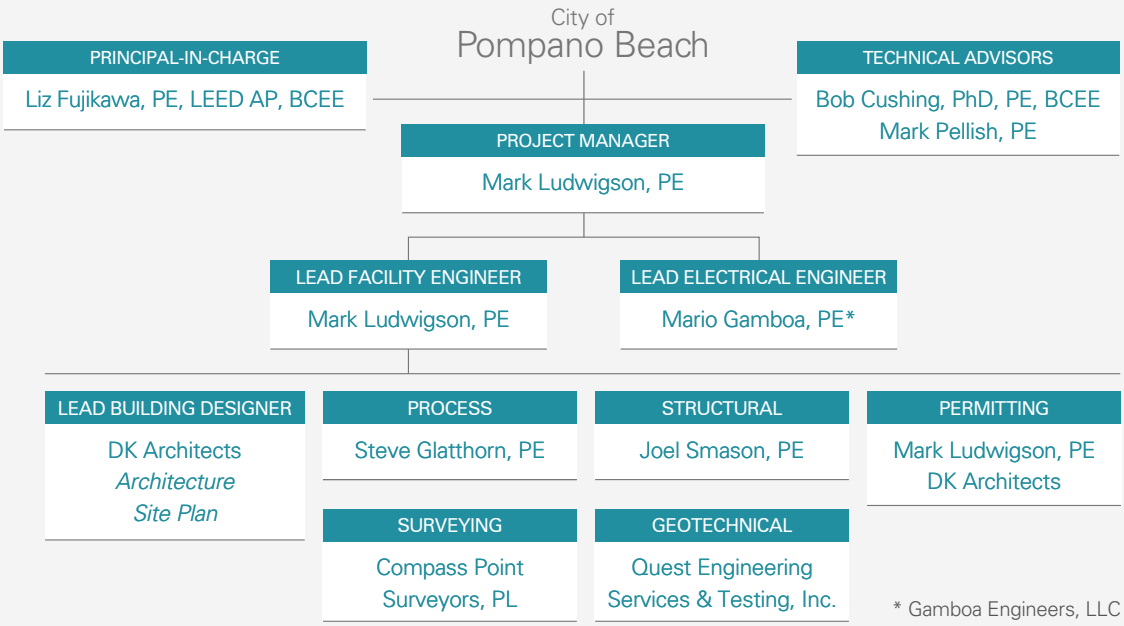
Principal-in-Charge

Liz Fujikawa, PE, LEED AP, BCEE

Liz has over 33 years of experience managing vast and complex water and wastewater projects. She has excellent communication skills, and will be able to work with you to understand your needs, and, in turn, translate those needs to our team.

Liz has worked with the City and other southeast Florida clients, including Boynton Beach, Broward County, South Central Regional Wastewater Treatment and Disposal Board, and Miami-Dade County.

Liz will be responsible for ensuring that Mark has all of the resources that he needs to keep the project on schedule.



* Gamboa Engineers, LLC

Lead Electrical Engineer

Mario Gamboa, PE

Mario has 39 years of experience in electrical engineering. He founded Gamboa Engineers, LLC in 2012. (See the firm profile on page 20.)

He was formerly Carollo's, Chief Electrical Engineer for over 15 years. Due to Mario's close relationship with Carollo, the firms work seamlessly in delivering innovative ideas.

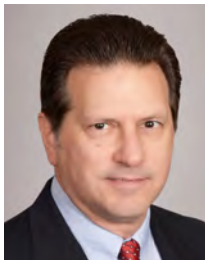
Mario will be responsible for all of the study, design and construction management of the electrical components of this project.

Technical Advisors

Bob Cushing, PhD, PE, BCEE

Bob has over 30 years of experience in the water industry. He has coupled fundamental concepts with sound engineering practices to provide creative, innovative, and enduring solutions to challenges faced by water utilities. He has been responsible for numerous successful treatment facility planning and design projects.

Bob will provide consultation on facility-related issues.



Mark Pellish, PE

Mark has 34 years of experience, specializing in electrical engineering projects. He has served as a professional engineer in the areas of design, permitting, and bidding and construction. Mark's expertise consists of design of electrical power distribution systems for water and wastewater treatment plants, pump stations, manufacturing plants, office buildings, warehouses, and other commercial facilities.

Mark will provide consultation on electrical-related issues.

MANAGEMENT PLAN

Carollo proposes to use a simple organization structure to allow for ease of communication between you and our Project Manager, **Mark Ludwigson**. Our Project Manager will be responsible for blending the facility design with the electrical engineering needs, control project schedule and budget, and coordinate our Lead Electrical Engineer, **Mario Gamboa**. And as always, our Principal-in-Charge, **Liz Fujikawa**, will monitor your project for Carollo's commitment of our resources and as a general check on your satisfaction with our services. Our Technical Advisors, **Bob Cushing** and **Mark Pellish**, will use their extensive experience provide expert advice to the project team.

QUALIFICATIONS OF TECHNICAL STAFF (KEY PERSONNEL)

As requested in the RFQ, below you will find our Technical Staff's (Key Personnel's) qualifications/education/experience on Similar Projects. For greater detail, please refer to *Section 6. Resumes of Key Personnel*.

SUBCONSULTANTS

To provide the most value to the City for this Electrical Master Plan, Carollo has selected an exceptional lineup of subconsultants to complement the technical expertise of our staff. On page 20, we have provided brief firm profiles for each subconsultant, demonstrating the expertise each brings to the Team.

Qualifications of Technical Staff (Key Personnel)

Name/Firm/Role/ Years of Experience	Education/Licenses	Experience on Similar Projects
Mark Ludwigson, PE Carollo Project Manager/ Lead Facility Engineer 18 Years of Experience	MS Engineering, University of Wisconsin BS Engineering Mechanics, University of Wisconsin Professional Engineer, FL, WI	▪ Project manager for finished water transfer pump station improvements at the City of Pompano Beach's WTP. This project incorporated electrical improvements. ▪ Project manager for the City of Pompano Beach's Concentrate Disposal project. ▪ Project manager for a new potable water storage tank and pump station at Site 1B1 and Site 3A for Broward County, FL. This project incorporated new electrical systems. ▪ Project manager for a new potable water storage tank at Site 2A for Broward County, FL. This project incorporated new electrical systems. ▪ Project engineer for the City of Sunrise, FL, Sawgrass WTP, which included electrical improvements. ▪ Project manager for electrical design services for water treatment facilities for the City of North Miami Beach (NMB Water), FL.

Qualifications of Technical Staff (Key Personnel) (cont.)

Name/Firm/Role/ Years of Experience	Education/Licenses	Experience on Similar Projects
Liz Fujikawa, PE LEED AP, BCEE Carollo Principal-in-Charge 33 Years of Experience	MSE Environmental Engineering, University of Michigan BS Chemistry, University of Illinois, Urbana-Champaign Professional Engineer, FL, IL, WI LEED Accredited Professional	▪ Project manager for the City of Pompano Beach's Electrical System Master Plan for the water treatment plant. ▪ Project manager for the City of Pompano Beach's Electrical System Phase I Upgrades. ▪ Project manager for Owner's Representative Services for the City of Pompano Beach's Electrical System energy efficiency project. ▪ Project manager for an evaluation of long-range treatment by Lime Softening versus Nanofiltration for the City of Pompano Beach. ▪ Project manager for the Broward County, FL, Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. ▪ Project manager for the City of Boynton Beach, FL, Ion Exchange Treatment System and East WTP Improvements Progressive Design-Build.
Mario Gamboa, PE Gamboa Engineers Lead Electrical Engineer 39 Years of Experience	BS Electrical Engineering; Engineering Management Graduate Studies, Both Florida International University Electrical Engineer, FL, CA Master Electrician, Various FL Counties	▪ Electrical engineer for the City of Pompano Beach's Water Treatment Plant, Electrical Assessment and Electrical Master Plan for Upgrades and Urgent Replacement of 5-KV Power Distribution System. ▪ Electrical engineer for the City of Pompano Beach's Water Treatment Lime Softening Plant, Electrical Improvements Phase I, Phase II and Phase III projects. ▪ Electrical engineer for a new potable water storage tank and pump station at Site 1B1 and Site 3A for Broward County, FL. ▪ Electrical engineer for a new VPSA Oxygen Generation Facility at the Miami-Dade Water and Sewer Department, FL, CDWWTP. ▪ Electrical engineer for the Manatee County, FL, SWWRF Electrical Master Plans. ▪ QA/QC for the Manatee County, FL, SEWRF and NRWRF Electrical Master Plans.
Bob Cushing, PhD, PE, BCEE Carollo Technical Advisor 30 Years of Experience	PhD Civil Engineering; MS Civil Engineering; BS Petroleum Engineering, All University of Texas, Austin Professional Engineer, FL, IL, NC, SC, VA	▪ Technical advisor for the City of Boynton Beach, FL, MIEX System. ▪ Technical advisor for the City of Boynton Beach, FL, Utilities Management Optimization Plan. ▪ Technical advisor for the City of Sunrise, FL, Sawgrass Water Treatment Plant Ion Exchange project. ▪ Technical advisor for the design of the Miami-Dade Water and Sewer Department, FL, 225-mgd Hialeah and Water Treatment Plants. ▪ Technical advisor and project director for the 54-mgd ultrafiltration (UF) Lake Manatee Water Treatment Plant, Manatee County, FL. ▪ Principal-in-charge for the preliminary expansion design for the City of Venice Gardens, FL, Water Treatment Facility.
Mark Pellish, PE Carollo Technical Advisor 34 Years of Experience	BS Electrical Engineering, Lehigh University Professional Engineer, FL, AR, PA	▪ Electrical engineer for the Seminole County, FL, Markham Regional Water Treatment Plant Upgrades. ▪ Electrical engineer for the Tampa Electric Company, FL, TEC Polk Power Station RO Water Treatment Plant. ▪ Electrical engineer for the City of Oldsmar, FL, RO Water Treatment Plant. ▪ Electrical engineer for the Pinellas County, FL, Pinellas County WTE Water Treatment Plant. ▪ Electrical engineer for the Peace River Water Authority, FL, Peace River Facility Expansion. ▪ Electrical engineer for the City of Clermont, FL, Sunburst Lane Water Treatment Plant System Upgrades.

Gamboa Engineers, LLC | Electrical Engineering

Gamboa Engineers, LLC is a consulting firm specialized in planning, designing, and engineering support during construction of electrical power distribution, process controls and instrumentation systems with focus in support of water treatment/distribution facilities and wastewater treatment facilities. The firm also has a broad range of experience in system integration and designing SCADA system for monitoring and control of geographically dispersed water and wastewater pumping facilities.

Gamboa Engineers provides a safe, economical and functional design; satisfying the customers needs on time and on budget. The firm has strong analysis and design capabilities with a broad range of experience and in-depth knowledge of construction and maintenance.

DK Architects | Architecture, Site Plan, Permitting

DK Architects is an architecture design firm located in Pompano Beach. They have been in Florida for 40 years, and, because of this and their deep understanding of local needs, they are one of the most trusted firms in the area. DK Architects provides a wide range of services, including fast tracking, value engineering, construction management, prototype development and project feasibility. Additionally, their architectural firm can also provide inspections, windstorm certifications, and site assessments.

DK takes great pride in its history of collaboration with the City of Pompano Beach, including Continuing Services Contracts with both the City and the Pompano Beach CRA, successfully completing projects, such as Briny Avenue Streetscape and Undergrounding, BaCA and Ali Cultural Center adaptive re-uses and new construction.

Compass Point Surveyors, PL | Surveying

Compass Point Surveyors is a modern survey firm that uses the latest technology to provide their clients with the best service in the most efficient manner possible. Established in 2006, Compass Point provides surveying services from the Florida Keys north to the City of Jupiter. Field crews regularly use GPS receivers, robotic total stations and data collectors linked to their office staff with cell phone WiFi. They use the latest CAD software and surveying modules to produce accurate and encompassing plans, digital files, and CAD drawings.

Compass Point is experienced in preparing boundary, ALTA, title, topographic, construction, route, design and quantity surveys in addition to preparing legal descriptions and elevation certificates. Their team has almost 80 years of field and office surveying experience.

Quest Engineering Services & Testing | Geotechnical

Quest Engineering Services & Testing, Inc. (QuEST), located in Pompano Beach, was founded in 1998 by R.N. Sailappan, P.E. Prior to that, R.N. was the branch manager of a large nation-wide engineering firm in Fort Lauderdale. QuEST was established to provide the complex engineering services and capabilities of a large firm, but with the personalized service and attention to detail of a small firm.

QuEST provides geotechnical services, including investigation of subsurface conditions and materials, assessing risks posed by site conditions, design of earthworks and structural foundations, and monitoring of site conditions and earthwork and foundation construction. They have successfully completed large commercial, educational, and residential projects as well as municipal projects throughout South Florida.

CURRENT AND PROJECTED WORKLOAD

Workload/Availability of Our Firm

As a highly ranked national firm that specializes in water and wastewater projects, Carollo continuously executes a high volume of work across a wide range of disciplines.

We currently have a vast client portfolio in Florida, serving clients through stand-alone and continuing services contracts. Our southeast Florida client based includes water work for you, as well as Broward County, Margate, Sunrise, Pembroke Pines, Fort Lauderdale, among others.

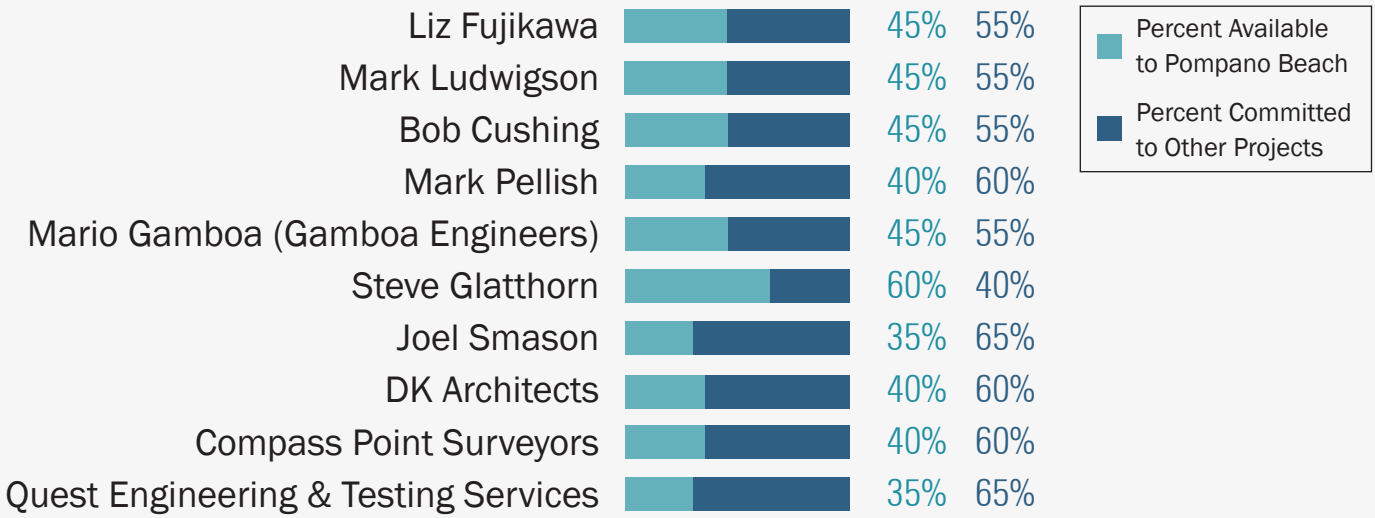
Our firm-wide workload committed to active and pending projects generally ranges between 65 and 70 percent. As a result, we have more than ample capacity to respond to our client's needs regardless of the size and nature of the work.

We are confident that our key team members and firm have the capacity and resources to deliver your projects within your desired time-frame.

Workload/Availability of our Personnel

The graphic on the next page summarizes each staff member's availability to participate in this project. The level of availability indicated in this graph shows that staff have ample capacity for this project and we can hit the ground running.

Existing and Projected Workloads/Percentage of Availability



5. Statement of Skills and Experience of Project Team

During our 87-year history, Carollo has successfully led the industry in innovative, cost-saving solutions. According to *Engineering News Record* (ENR), we are ranked number ONE among all engineering firms that work solely in water.

WE ARE A LOCAL FIRM WHO UNDERSTANDS YOUR ISSUES

We are also experts in the local concerns of utilities like yours in South Florida, addressing your day-to-day needs as well as Broward County WWS, the South Central Regional Wastewater Treatment and Disposal Board, Palm Beach County, Miami-Dade County, Sunrise, and Margate. We understand the issues that you are facing: aging infrastructure; water reliability; meeting treatment goals; managing energy costs; accounting for variability in chemical and labor costs; providing for future flexibility; and meeting regulatory requirements of FDEP and the Health Department.

What Does All This Mean?

Carollo brings a proven track record of projects completed on time and within budget, with an emphasis on industry-leading technology to maximize your dollars.

WHAT SETS US APART?

Our Industry Leadership

Carollo only provides services supporting water and wastewater-related services. We focus on the water/wastewater industry, fostering a reputation for leadership and innovation. Our leadership role is exemplified by the following:

- **First engineering firm in the waterworks industry to apply computational fluid dynamics (CFD)** the groundbreaking application was optimization of the hydraulic characteristics of an ozone contact chamber. We recently developed a CFD model for your IX contactor design. Improving on the design we did for Palm Beach County's system, incorporated alternating mixer directions to create a more uniform resin bed, which lowered resin loss, and increased efficiency resin contact.
- **Pioneered the use of UV irradiation for drinking water** treatment via multiple research projects with WaterRF and construction of the first full-scale UV validation facility in North America.
- **First engineering firm to incorporate micro- or ultrafiltration in conjunction with lime softening treatment.** This concept was pioneered by Carollo and tested on pilot scale operations in the Midwest. Full-scale, award winning facilities employ this exciting technology, now being utilized by numerous other clients seeking superior water quality at an affordable price.
- **Carollo developed the use of biological active filtration** for the removal of a host of compounds from drinking water supplies, including nitrates, MIB & geosmin, pharmaceutical compounds, perchlorate, and a host of other contaminants. Several pilot testing programs are now underway and full-scale facilities being designed to incorporate these customized removal technologies at vastly reduced cost when compared to alternative treatment technologies, such as RO treatment.
- Multiple times over the last 10 years, **Carollo has led the industry with the most number of papers accepted for presentation at national conferences** (i.e., AWWA, ACE, and WEFTEC), and has consistently been in the top three regarding number of papers presented. Our leadership in the industry has also been recognized with the award of several WaterRF, WateReuse Foundation, and Water Environment Federation research projects.

Award-Winning Recognition

State of the Art MIEX® System

- This project won an award from the Florida Institute of Consulting Engineers.
- The system is the largest MIEX System of its type in North America.
- The system has saved PBC approximately $310,000/year in operations costs.

Expansion to 11.6 mgd

- This project won the 2012 Florida Section Design-Build Institute of America (DBIA) Award for Water/ Wastewater projects.
- Provided pilot testing, design, and construction phase services for the membrane treatment system.

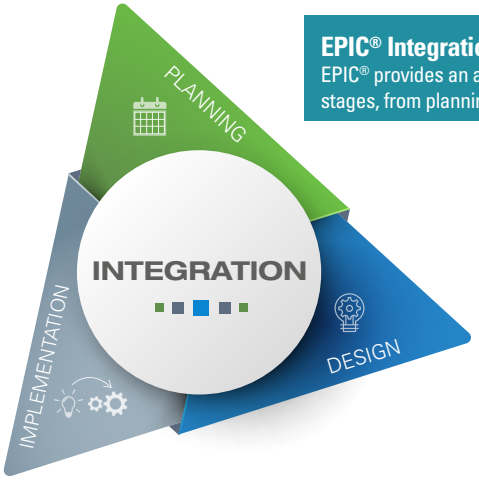
Design of Pump Station and Inflow Structure

- The L-8 Flow Equalization Basin Project received the “Engineering Project of the Century” Award from the Florida Engineering Society.

CAROLLO'S ELECTRICAL EXPERIENCE

Carollo has a dedicated electrical, programming, instrumentation and control (EPIC®) design center. Our EPIC® group, which integrates the two disciplines for seamless design, consists of more than 92 engineers and technicians, making the group one of the largest in the water and wastewater industry. This group of dedicated electrical and instrumentation engineers and technicians supports a full array of electrical services for clients throughout the country, including:

- EI&C system planning and design.
- Comprehensive electrical system studies.
- SCADA system programming and integration.
- PLC programming and HMI configuration.
- Arc flash studies.
- Advanced automation and process optimization.
- System testing and commissioning.
- Networking.
- Intelligent MCCs and P&IDs.



EPIC® Integration
EPIC® provides an array of services at all stages, from planning to implementation.

Electrical Safety Design

Carollo's electrical team has designed upgrades and equipment replacements for literally hundreds of water and wastewater facilities nation-wide. As routine practice, Carollo's electrical designs integrate many "Safety By Design" features to enhance maintainability of equipment and safety O&M personnel. These features include main-tie-tie-main switchgear and motor control centers, arc-resistent equipment, remote circuit breaker racking and controls, maintenance-mode switching, advanced protection relaying schemes, and isolation of high arc flash incident energy equipment.

CAROLLO'S MASTER PLAN EXPERIENCE

Carollo has completed over 20 master plans throughout Florida, many of them have been in the past 5 years as the economy has recovered and municipalities are able to proactively plan out future capacity and aging infrastructure replacement needs. Typically, all of our master plans that include treatment plants and pumping

stations have an electrical system component. Our master planning approach brings the benefit of not only replacing aging equipment, but also, increasing the level of reliability and redundancy over what was initially provided with the original design.

A summary of Carollo's recent Florida master planning experience is provided in the table on the next page.

GAMBOA ENGINEERS' ELECTRICAL MASTER PLAN EXPERIENCE

Our electrical subconsultant on this Electrical Master Plan is Gamboa Engineers, LLC, which was founded by Mario Gamboa, PE, who was formerly Carollo's Chief Electrical Engineer for over 15 years. Gamboa Engineers is an MBE and SBE, specializing in electrical and instrumentation and control (I&C) engineering. Due to Mario's close relationship with Carollo, the firms work seamlessly in delivering innovative ideas, primarily in south Florida. Gamboa Engineers is currently providing electrical and I&C engineering on projects with Carollo for Pompano Beach, Broward County Water and Wastewater Services, Margate, Boynton Beach, and the South Central Regional WWTP.

Gamboa Engineers specializes in master planning, design and construction management of water and wastewater projects for municipalities. Work has included electric energy and automation for water treatment, wastewater treatment and pumping stations. The firm has provided electrical design and instrumentation for 115 kV substations, medium voltage class (5-kV through 38-kV) and low-voltage power distribution systems, including prime and standby power generations systems, power for large pumps-motors with 5 kV variable speed controls systems, lighting systems, life safety systems, grounding, lightning protection, and automation systems.

OUR PROJECT TEAM ROUTINELY TACKLES COMPLEX PROJECTS

As a specialist in water services, Carollo is routinely tasked with addressing projects that have complex issues to be solved. A few examples of these follow:

- **Upgrading while Maintaining Water Production.** Nearly every one of our project requires that the plant maintain continuous water production, or at most, only brief shutdowns are allowable. We solve those needs by using approaches, such as specifying temporary power (such as a portable generator), making hot taps on pipelines, doing channel tie ins with divers, and designing a new system to easily be placed online through a parallel replacement process.
- **Permitting Approvals.** We have a number of examples where permitting approval was challenging, such as the case of "first applications" of new treatment processes, where a delay in regulatory approval can be detrimental to a schedule. Our approach is always to keep the regulatory Agencies involved from the project onset, the earlier they are tied in to the planned work, the earlier we can respond to their questions and concerns, and that leads to maintaining our client's schedules.
- **Upgrading Existing Systems.** Integrating a new electrical system into an aged water treatment plant has a whole array of issues that must be addressed, such as fitting modern components into spaces laid out 30 years ago, running underground ductbanks through congested yards, and upgrading ventilation systems to accommodate heat loads.

PROJECT DESCRIPTIONS

Starting on page 27, we include the five descriptions you requested of similar projects we've completed.

OUR PARTNERING APPROACH KEEPS YOU ENGAGED

"The work performed by Carollo consistently met or exceeded our expectations, particularly with respect to proactive and effective communication between all parties."

– Paul Mattausch, Water Department Director
Collier County, FL

Carollo's Recent Florida Master Planning Experience

Client / Project	Project Elements					
	Electrical System Assessment and Planning	Capacity Planning	Condition Assessment	Treatment and Pump Station Planning	Cost Estimating	CIP Development and Funding
Boynton Beach Utilities Management Optimization Plan		●		●	●	●
Town of Davie Utility Master Plan		●	●	●	●	●
Orange County Utilities North, East, and South Water Reclamation Facilities Condition Assessments, Asset Management Plans, and Facilities Master Plans	●	●	●	●	●	●
Pompano Beach Electrical Master Plan	●		●		●	●
Manatee County Master Lift Station Asset Management Plan	●		●	●	●	
Daytona Beach Wastewater Master Plan	●	●	●	●	●	●
Palm Beach County Water Master Plan Updates		●			●	●
Deerfield Beach Integrated Master Plan	●	●	●	●	●	●
Manatee County Wastewater Collection System Master Plans		●		●	●	●
Pompano Beach Water Master Plan Update		●	●	●	●	●
Manatee County Water Southwest, Southeast, and North Water Reclamation Facilities Condition Assessments and Asset Management Plans	●	●	●	●	●	●
Orange County Utilities Potable Water Supply Facilities Condition Assessments, Asset Management Plans, and Facilities Master Plans	●	●	●	●	●	●
City of Tampa David L. Tippin Water Treatment Facility Master Plan	●	●	●	●	●	●
Pasco County Southeast Wastewater Treatment Plant Condition Assessment and Facility Plan	●	●	●	●	●	●
St. Petersburg Southwest Water Reclamation Facility Asset Management			●		●	
Orlando Utilities Commission Plant System Electrical Reliability Project	●		●		●	
Bay County Military Point Advanced Wastewater Treatment Facility Asset Repair and Replacement Plan			●		●	
Pinellas County Reclaimed Water Master Plan		●		●	●	●

SELECTION OF CAROLLO'S OTHER SIMILAR PROJECTS NOT INCLUDED AS DESCRIPTIONS

In addition to the five project descriptions that you requested in the RFQ, we have provided a selection of Carollo's other Florida projects that show experience of similiar size and complexity in the table below.

Selection of Carollo's Other Florida Experience of Similar Size and Complexity

Client/Project Name	Role	Engineering Disciplines	Fee	Construction Cost
City of Margate - East WTP and WWTP Improvements	Prime	A, C, CM, E, H, P, PM, S	$1.4 Million	$11 Million
City of Boynton Beach - Ion Exchange System	Prime	A, C, CM, E, H, P, PM, S	$1.2 Million	$11 Million
Palm Beach County - WTP No. 2 Ion Exchange System	Prime	A, C, CM, E, H, P, PM, S	$900,000	$8 Million
Palm Beach County - WTP No. 2 Filter Improvements	Prime	A, C, CM, E, H, P, PM, S	$750,000	$13 Million
City of Boynton Beach - Utilities Management Optimization Plan	Prime	A, C, E, H, P, PM, S	$1.08 Million	TBD
Manatee County - North, Southeast, and Southwest Wastewater Collection System and Reclamation Facility Master Plan Updates	Prime	PM	$722,986	N/A
South Central Regional Wastewater Treatment and Disposal Board - WWTP Blower and Efficiency Upgrades - Progressive DB	Prime	C, CM, E, H, P, PM, S	$1 Million	$11 Million
South Florida Water Management District - L8 Reservoir Intake Structure and Pump Station	Prime	A, C, CM, E, H, P, PM, S	$7 Million	$65 Million
South Florida Water Management District - C43 PS S-470 Pump Station Design	Prime	A, C, CM, E, H, P, PM, S	$3.5 Million	$65 Million

Engineering Disciplines:
A=Architectural, C=Civil, CM=Construction Management, E=Electrical, H=HVAC, P=Plumbing, PM=Process Mechanical, S=Structural

ELECTRICAL IMPROVEMENTS AS PART OF CONSULTING SERVICES ENGINEERING CONTRACT

CITY OF POMPANO BEACH, FLORIDA

Carollo, under the Consulting Services Engineering Contract for the City, completed several studies and designs. Relevant projects that have been completed (or are ongoing) include:

Electrical Master Plan and Engineering Services

Carollo and Gamboa Engineers developed an electrical master plan for upgrading the electrical 5 kV power distribution system for the lime softening treatment facilities. Existing electrical equipment was assessed throughout the plant. Potential improvements were identified and discussed with City staff. A technical memorandum was developed with specified recommendations grouped into five separate phases of construction. Cost estimates were created for each phase.

Engineering services also included a short-circuit analysis, protective device coordination analysis, and arc-flash analysis for safety and protection of O&M personnel. Additional services also included serving as the Owner's Representative for an energy efficiency project being performed by Siemens. This work was associated with the installation of new variable frequency drives (VFDs) for the speed control of 700-HP high service water pumps.

Electrical Improvements for Master Plan Phases I and II

Implementation of the electrical improvements identified in the master plan began with Phase I work and was followed with Phase II work. These improvements provided for critical needs at the HSP 1-4 Building. Carollo and Gamboa Engineers produced the design documents and assisted the City with bidding and awarding to contractors.

Phase I improvements included removal of an existing standby generator and ancillary items, HVAC improvements, 5 kV duct banks, new 5kV MCCs, lighting for electrical rooms, and fire alarm system upgrades. Phase II improvements included replacement of obsolete 5 kV / 480V transformers, 480 volt switchboards, new MCC for backwash pumps, intercepting and extending the power feed to the public works building, and modifying the power feed to existing pumps.

The improvements significantly improved the reliability of the electrical system and helped maintain compliance with current building and life safety codes.

WTP Transfer Pump Station Improvements

As part of the Phase V improvements, the scope includes pump, motor, and VFD selection for five vertical mixed-flow pumps, upgrades to electrical equipment at the transfer station, a new duck bank for 5 kV wiring to provide redundancy, and ancillary improvements for HVAC, access, lighting, stairway, and level control.

ROLE OF THE FIRM

Prime

PROJECT SIZE

Design Fee of $520,000 (Design and Construction Admin.)

CONSTRUCTION COST

$4.5 Million

COMPLETION DATE

Construction scheduled for completion in 2020

TEAM INVOLVEMENT

Liz Fujikawa, Principal-in-Charge (PIC)
Mark Ludwigson, Project Manager (PM)
Mario Gamboa, Electrical
Joel Smason, Structural

REFERENCE

Randy Brown, Utilities Director
954-545-7044 | randolph.brown@copbfl.com

NEW ELECTRICAL SYSTEMS FOR BROWARD COUNTY PUMP STATIONS

BROWARD COUNTY, FT. LAUDERDALE, FLORIDA

Carollo was selected to provide planning, design, and construction phase services for three of Broward County's facilities, including new electrical power feeds, power distribution, a new electrical room, and standby power. A summary of the electrical work at each site is as follows.

District 3A: The high service pump station at Site 3A supplies potable water to the Fort Lauderdale–Hollywood International Airport. Reliability is of extreme importance for this facility. Carollo and Gamboa Engineers designed a new electrical system with robust features including the following: a new 13-kV transformer, a spacious electrical room with air conditioning, a double ended switchboard with a tie-breaker in the middle, a Tier 2 engine generator with a fuel tank, a fiber optic loop around the property, and the latest VFD technology for 200 HP pumps. Construction is scheduled for completion in 2020.

District 1B1: The new high service pump station at Site 1B1 is located in a flood plain, so all electrical equipment was designed to be 2 feet above the 100 flood elevation. A new power feed was designed for the pump station which included up to 6-foot wide duct banks. Work includes a new transformer on a new easement with FPL, an air conditioned electrical room, a double ended switchboard, new MCC and PLC, a Tier 2 engine generator with a fuel tank, and the latest VFD technology for 125 HP pumps. Construction is scheduled for completion in 2020.

District 2A: Carollo and Gamboa Engineers provided master planning services for a new high service pump station and electrical building at Site 2A. The new pump station features 500 HP pumps with VFDs and advanced controls. Carollo provided design recommendations for a new electrical building that includes 13-kV, 5-kV, and 480-V electrical equipment to distribute power throughout the 2A WTP. Standby generators were also included in the design.

New Pump Station Construction at District 1B1.

ROLE OF THE FIRM

Prime

PROJECT SIZE

Design Fee of $4 Million

CONSTRUCTION COST

$27.3 Million

COMPLETION DATE

Ongoing

TEAM INVOLVEMENT

Liz Fujikawa, PIC
Mark Ludwigson, PM
Mario Gamboa, Electrical Engineer
Joel Smason, Structural

REFERENCE

Steven Doyle, Construction Project Manager Supervisor
954-831-0962 | sdoyle@broward.org

SRWRF AND NRWRF ELECTRICAL MASTER PLANS

MANATEE COUNTY, BRADENTON, FLORIDA

Carollo developed Electrical Master Plans for both the Southeast Regional Water Reclamation Facility (SEWRF) and North Regional (NRWRF), in parallel, to guide the development of electrical projects targeted to deal with aging infrastructure and population increase. Condition assessments of existing equipment, reliability and analysis of single points of failure, electrical safety, high maintenance components, and utility reliability and costs were all analyzed as part of the planning process.

Recommendations for improvements were then made related to operational improvements for safety and reliability, short-term or immediate improvements that are low cost or easy to implement but high value, and larger scale Capital Improvement Projects. All electrical systems and equipment were evaluated at both sites and opinions of upgrade costs provided for each proposed project.

A final master plan report was created for each facility to summarize existing conditions and recommended upgrades. The project came in under budget due to efficiencies gained by providing master plans for both facilities in parallel.

ROLE OF THE FIRM

Prime

PROJECT SIZE

N/A

CONSTRUCTION COST

$138,538 (SEWRF) / $114,104 (NRWRF)

COMPLETION DATE

2018

TEAM INVOLVEMENT

Bob Cushing, PIC
Mario Gamboa, QA/QC

REFERENCE

Chuck Froman, Wastewater Facilities Superintendent
941-792-8811 | chuck.froman@mymanatee.org

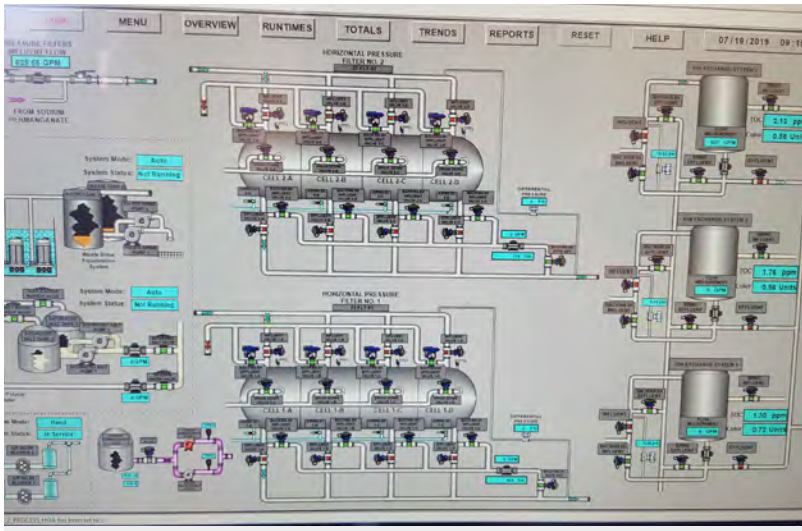
ELECTRICAL IMPROVEMENTS AT THE SAWGRASS WATER TREATMENT PLANT

CITY OF SUNRISE, FLORIDA

Carollo provided design and construction administration services for ion exchange improvements project at the Sawgrass WTP. Work included a new Electrical/Chemical Building with state of the art electrical and controls equipment. A new power feed was routed over 1,000 feet from a new 600 amp breaker to the new electrical building.

The main electrical room is air conditioned and includes space for maintenance activities. It includes a new transformer, MCC, control panels, power panels, lighting panels, an air handling unit, and access control features. The new electrical system provides power and controls for over 100 water treatment devices, each with associated control logic and alarms. New control panels were designed with large touch screens and SCADA interface. New VFDs were provided for advanced pump control.

The new system was successfully commissioned in 2019.



ROLE OF THE FIRM

Prime

PROJECT SIZE

Design Fee of $680,000

CONSTRUCTION COST

$8.9 Million

COMPLETION DATE

August 2016 (Design), November 2019 (Construction)

TEAM INVOLVEMENT

Mark Ludwigson, Project Engineer
Joel Smason, Structural

REFERENCE

Timothy Welch, Director of Utilities
954-888-6055 | twelch@sunrisefl.gov

ELECTRICAL DESIGN SERVICES FOR WATER TREATMENT FACILITIES

CITY OF NORTH MIAMI BEACH (NMB WATER), FLORIDA

Carollo provided electrical planning and design services for the City of North Miami Beach (NMB Water). Carollo and Gamboa Engineers played a key role in solving several electrical and controls challenges at the Norwood WTP. The following is a summary of the services provided:

- Served as the on-call electrical engineering consultant for the Norwood WTP. This included receiving urgent calls at any time of day and responding promptly to help troubleshoot issues.
- Assessed the reliability of the existing FPL power services to the Norwood WTP.
- Designed for the additional of a third separate FPL power sources for the WTP. Gamboa Engineers worked closely with FPL in assessing the existing power supply grid and identifying a means to have a third power source for the WTP.
- Provided onsite troubleshooting of a malfunctioning generator circuit breaker at a water well. Identified the problem and coordinated with Caterpillar for repairing of defective controls.
- Investigated the cause of a power failure that led to a decrease in pressure in the distribution system and an associated boil water alert.
- Coordinated with FPL for the replacement of two power feeders for two high service pump stations.
- Provided technical assistance for troubleshooting of a malfunctioning transfer switch circuit breaker at the Operations Center. Coordinated with the equipment supplier for the modification of defective controls.
- Reviewed a failure of a voltage surge protective device that interrupted continuous critical electric power to the plant SCADA system. Gamboa Engineers identified the cause of failure and recommended replacement of two damaged voltage surge protective devices.
- Created drawings for a new power distribution scheme to increase the reliability of the electrical system. This included the design of additional power distribution equipment in electrical rooms.
- Coordinated with FPL for surge arrestor repairs, provided a scheme for an additional surge protecting devise on existing older equipment, and designed for grounding system improvements.

ROLE OF THE FIRM

Prime

PROJECT SIZE

Design Fee of $100,000

CONSTRUCTION COST

$450,000

COMPLETION DATE

2018

TEAM INVOLVEMENT

Liz Fujikawa, Principal-in-Charge
Mark Ludwigson, Project Manager
Mario Gamboa, Electrical Engineer
Joel Smason, Structural

REFERENCE

Chris Catlin, Water Operations Consultant for NMB Water/Jacobs
651-491-1242 | chris.catlin@jacobs.com

6. Resumes of Key Personnel

Each team member has demonstrated experience that comes only from years of practice in their respective disciplines and the creativity and drive to find a successful solution by thinking outside the box.

On the following pages, we have provided two-page resumes for key personnel for both Carollo (the prime) and our subconsultants.

We have a provided mini-bios for Carollo's key team members and brief descriptions of our subconsultants' firm profiles in *Section 4. Organizational Chart*.

As requested in the RFQ, the Carollo team will have a **LEED-accredited professional**. In fact, we will have TWO staff with LEED accreditation for this project: **Liz Fujikawa**, the Principal-in-Charge, and **Andre Capi from DK Architects**.

Our Proposed Lead Electrical Engineer, Mario Gamboa, Meets All of Your Criteria

- ✔ **Is a registered Professional Engineer in the State of Florida.**
- ✔ **Will act as the Engineer of Record for the electrical design.**
- ✔ **Has 39 years of design experience in South Florida.**
- ✔ **Is based in Southwest Ranches in Broward County.**
- ✔ **Has experience developing and implementing 12 Electrical Master Plans.**

As requested in the RFQ, we are providing a copy of one of Mario's previous Electrical Master Plans in *Section 13. Appendix*.

Office Location

Coral Gables, FL

Education

MS Engineering, University of Wisconsin, Milwaukee, 2010

BS Engineering Mechanics, University of Wisconsin, Madison, 2001

Licenses

Professional Engineer, Florida, Wisconsin

Certification

Certificate, Project Management Bootcamp, PSMJ Resources, 2017

Certificate, Six Sigma Green Belt, Management and Strategy Institute, 2014

Certificate, Project Management Qualified, Management and Strategy Institute, 2014

Certificate, Quality Management in the Design Organization, American Society of Civil Engineers, Florida, 2014

Certified, 10-Hour OSHA Construction Safety and Health, Safe-Con, LLC, 2013

Certificate, Confined Space Attendant, Entrant, and Entry Supervisor, Symbiont, Wisconsin, 2009

Mark N. Ludwigson, PE

Mark Ludwigson has 18 years of engineering experience with projects across the country. He has worked solely in the water environment industry since 2004 and is passionate about water systems. Mark was the lead engineer for a prominent circular clarifier manufacturer for a number of years. He has brought success to a variety of water projects, whether serving as project manager or project engineer. Mark is trusted for civil, mechanical, and process design discipline work.

Relevant Experience

→ Project manager for finished water transfer pump station improvements at the City of Pompano Beach, Florida, Water Treatment Plant. The pump station has a rated capacity of 35 mgd and feeds two ground storage tanks. The design includes resizing of five 50-HP vertical mixed flow pumps, the addition of VFDs, new 5 kV switchgear, HVAC upgrades, and miscellaneous structural improvements.

→ Project manager for the City of Pompano Beach, Florida, Concentrate Disposal project. Alternatives for disposal of membrane concentrate were developed and compared, including introducing concentrate into a reclaimed water plant. A new concentrate disposal pipeline was designed and permitted. Construction was completed in November 2017.

→ Project manager for construction of improvements at the City of Delray Beach, Florida, Water Treatment Plant. Work included rehabilitation of a lime softening clarifier, eight sand filters, and a new sodium hypochlorite tank. Construction was completed in February 2020.

→ Project manager for a new potable water storage tank and pump station at Site 3A for Broward County, Florida. Improvements include a 2.5-MG pre-stressed concrete ground storage tank with special architectural features, 11.5-mgd high service pump station, sodium hypochlorite and ammonium sulfate feed systems, 4-log disinfection system, new wastewater lift station, a new FPL transformer, electrical room, and associated improvements.

→ Project manager for a new potable water storage tank and pump station at Site 1B1 for Broward County, Florida. Improvements include a 1.5-MG pre-stressed concrete ground storage tank, 8.0-mgd high service pump station, sodium hypochlorite and ammonium sulfate feed systems, special flood hazard area protection, a new electrical room, and associated improvements.

→ Project manager for a new potable water storage tank at Site 2A for Broward County, Florida. Improvements include a new 5.0-MG pre-stressed concrete ground storage tank, rehabilitation of an existing 5.0-MG ground storage tank, demolition of two existing ground storage tanks, chemical feed system modifications, yard piping up to 60-inch diameter, and a site drainage enhancements. Design included the layout of a new 30-mgd pump station with four vertical turbine pumps in cans and a new electrical building.

→ Project engineer for a new water storage tank and high service pump station at a Naval Air Station in Key West, Florida. Project included a new 0.5-MG glass lined steel tank and a pump station with vertical turbine pumps and electrical power supply.

→ Project engineer and quality reviewer for three pump stations at the South Florida Water Management District, Florida, C-43 reservoir project. The pump stations have rated flows of 1,500 CFS, 225 CFS, and 125 CFS. The pumps are vertical mixed flow types, with motor sizes vary in size from 2,500 HP to 75 HP. New electrical facilities were included in the pump station designs, including 5 kV equipment.

→ Project engineer for the City of Sunrise, Florida, Springtree Water Treatment Plant Phase II Improvements and Rehabilitation project. Work includes rehabilitating the solids contact clarifiers, replacement of a lime silo, concrete repairs, demolition of filters, a new 12-mgd transfer pump station, a new carbon dioxide storage and feed system, thickener supernatant return pipe

Mark N. Ludwigson, PE

Professional Affiliations

American Water Works Association

Florida Water Environment Association

Water Environment Federation

Awards

Kelman Award, Top Magazine Article, Central States Water Environment Association, 2012

Graduate Student Paper Competition Winner, Water Environment Federation, 2011

modifications, and improvements to the lime sludge thickening and dewatering process, including new rotary drum vacuum filters.

→ Project engineer for the City of Sunrise, Florida, Sawgrass Water Treatment Plant Ion Exchange and Other Improvements project. Work includes the addition of a 3-mgd ion exchange treatment system, sodium permanganate feed system, a new chemical building, and a degasifier cleaning system utilizing hydrochloric acid.

→ Project engineer for the City of Sunrise, Florida, Southwest Water Treatment Plant Ion Exchange and Other Improvements project. Mr. Ludwigson designed for the addition of an ion exchange treatment system, lime storage silo, and lime slaker and feed system.

→ Project manager for an evaluation of lime feed improvements for the City of North Miami Beach and NMB Water, Florida. The project involved evaluation of the existing lime feed storage and feed systems. Several upgrade alternatives were recommended, including layouts and cost estimates.

→ Project engineer for construction management services for the Palm Beach County Water Utilities Department, Florida, Water Treatment Plant No. 2 Filter Replacement project in West Palm Beach, Florida. This project includes a new filter structure with dual media filters rated for an initial capacity of 16.4 mgd and designed to be high rated to an ultimate capacity of 25 mgd. The filter structure also includes a clearwell, transfer and backwash pumps, air scour blowers, electrical room, and chemical feed connections.

→ Project engineer for construction management services for the City of Sunrise, Florida, Sawgrass Water Treatment Plant Rerate Improvements project. This project includes vertical turbine transfer pump replacements to increase rated pumping capacity from 32 mgd to 40 mgd. It also includes upgrading the sodium hypochlorite metering pumps and replacing the plant air compressor.

→ Project engineer for the City of Sunrise, Florida, Southwest Water Treatment Plant Ion Exchange and Other Improvements project. Mr. Ludwigson designed for the addition of an ion exchange treatment system, lime storage silo, and lime slaker and feed system.

→ Project manager for the City of North Miami Beach and NMB Water, Florida, Membrane Treatment System Improvements. The design included the following improvements for the reverse osmosis and nanofiltration membrane treatment systems: addition static mixers on the raw water lines, replacement of sulfuric acid and antiscalant chemical feed system components, and replacement of craddles for membrane supports.

→ Project engineer for sulfuric acid feed system modifications for the City of Sunrise, Florida, Sawgrass Water Treatment Plant. This project includes pump and piping modifications for feeding sulfuric acid at a reverse osmosis treatment system.

Publications/Presentations

→ Ludwigson, M.N, Rago, L, Greenfield, J. "Horizontal or Vertical? High-Service Pump Selection." Florida Water Resources Journal, 54-59, December 1, 2016.

→ Ludwigson, M.N., Butt, J. "Performance of Remote Wet Weather Treatment Facilities." Paper presented at the American Water Works Association Illinois Section Watercon Conference, Springfield, Illinois, March 20, 2012.

→ Ludwigson, M.N. "An Introduction to Biology for Everyone." Editor, Amazon Direct Publishing, January 1, 2012.

→ Ludwigson, M.N. "Sustainability Comparison Framework with Reduced Subjective Bias and Application to Two Odor Control Systems." Water Environment Federation Technical Exhibition and Conference, October 16, 2011.

Elizabeth Fujikawa, PE, LEED AP, BCEE

Elizabeth Fujikawa, a vice president with Carollo, has more than 33 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 WTP (1,000 mgd), and the Metropolitan Water Reclamation District of Greater Chicago's Stickney WRP (1,200 mgd).

Office Location

Coral Gables, FL

Education

MSE Environmental Engineering, University of Michigan, 1986

BS Chemistry, University of Illinois, Urbana-Champaign, 1984

Licenses

Professional Engineer, Florida, Illinois, Wisconsin

Civil Engineer, Delaware

Certification

LEED Accredited Professional, Green Building Certification Institute, 2006

Professional Affiliations

American Water Works Association

International Ozone Association

Relevant Experience

→ Project manager for the City of Pompano Beach, Florida, Electrical System Master Plan for the water treatment plant. The project consisted of master planning and design services for replacement and upgrade of electrical power distribution system with state-of- the-art equipment and materials.

→ Project manager for the City of Pompano Beach, Florida, Electrical System Phase I Upgrades. Work included 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, construction support services.

→ Project manager for Owner's Representative Services for the City of Pompano Beach, Florida, Electrical System energy efficiency project. Served as Owner's Representative during upgrades by Siemens to reduce energy usage at the water treatment facility.

→ Project manager for an evaluation of long-range treatment by Lime Softening versus Nanofiltration for the City of Pompano Beach, Florida. The project evaluated advantages and disadvantages to bring the existing lime softening treatment plant into a 20-year life-cycle condition versus an expansion of the nanofiltration treatment plant.

→ Project manager for the Broward County, Florida, Potable Water Storage Tanks, Pumping Systems, and Chemical Systems. This project includes the assessment, design and construction phase management of new ground storage tanks, new high service pump stations, and new sodium hypochlorite and ammonia feed and storage systems for disinfection. These improvements will be implemented at four locations within the County.

→ Project manager for a Bulk Sodium Hypochlorite Storage and Feed Facility for the South Central Regional Wastewater Treatment and Disposal Board, Florida, South Central Regional Wastewater Treatment plant. The facility will receive and store 12.5% sodium hypochlorite and meter the feed to the inlet to the tertiary filters for reuse.

→ Project manager for the City of Boynton Beach, Florida, Ion Exchange Treatment System and East Water Treatment Plant Improvements Progressive Design-Build. This project includes initial engineering and constructability evaluations, permitting, design, and construction of a 16.0-mgd ion exchange system, associated ancillary systems, and raw water transmission main modifications.

→ Project manager for the Central Lake County Joint Action Water Agency, Illinois, Ozone System Upgrade project. The project evaluated Air Fed versus Oxygen Fed (Vacuum Swing Adsorption) alternatives to supply the ozone generators. The project was designed and constructed using packaged Vacuum Swing Adsorption units.

→ Technical reviewer for the Miami-Dade County, Florida, 225-mgd Hialeah-Preston Water Treatment Plant chemical systems improvements.

→ Staff engineer for the Tampa Bay Water, Florida, Hydrogen Sulfide Treatment Improvements at the Lithia Water Treatment Plant. The current hydrogen sulfide removal facility will be replaced with a new, more reliable process. This new 45-mgd hydrogen sulfide removal facility will use ozone treatment and the project will be

Elizabeth Fujikawa, PE, LEED AP, BCEE

delivered with the Engineer-Procure-Construction Management approach.

→ Project manager for a pilot study for the Central Lake County Joint Action Water Agency, Illinois. Conducted a pilot study for treatment process selection for treatment of water from Lake Michigan. Primary issues were taste and odor and high turbidities up to 350 NTU. Pilot included the study of the impacts of ozonation on coagulation and filtration; evaluation of dissolved air flotation and a continuous backwashing filter; and benefits of granular activated carbon.

→ Project manager for the Central Lake County Joint Action Water Agency, Illinois, design of ozonation process. System consisted of a 50-mgd air fed ozone system with conventional contactors.

→ Project manager for the City of Oshkosh, Wisconsin, study and design of a new 16-mgd water treatment plant that treats low-turbidity, high TOC Lake Winnebago water. The treatment processes included an intermediate ozonation system for *Cryptosporidium* inactivation. System consisted of a LOX fed ozone process with conventional contactors.

→ Project manager for an ozone facilities retrofit project for the City of Green Bay, Wisconsin, 40-mgd surface water treatment plant to provide primary disinfection for *Cryptosporidium* inactivation. System consisted of a LOX fed ozone process with conventional contactors.

→ Project manager for an ozone feasibility study for the City of Chicago Department of Water Management, Illinois. The study evaluated the retrofit of ozone into the 300-mgd South Filtration Plant and the 1,000-mgd Jardine Filtration Plant to provide taste and odor control.

→ Project engineer for an oxidation retrofit program for the Metropolitan Water District of Southern California. Responsible for the development of the oxygen separation portion of the equipment prepurchase packages for the Jensen (750 mgd) and Mills (220 mgd) filtration plants.

→ Project engineer for the Preliminary Design of Filtration Plants for the City of Milwaukee, Wisconsin. Evaluated alternatives for gas feed and ozone generation equipment as part of the preliminary design for the Howard Avenue (105 mgd) and Linnwood (275 mgd) filtration plants. Also responsible for preparing the mechanical portion of the preliminary design of the ozonation facilities for the Howard Avenue Plant.

→ Responsible for preparing an Operations and Maintenance Manual for the City of Fort Worth, Texas, Eagle Mountain Water Treatment Plant 30-mgd ozonation system, Texas. The system provided disinfection and taste and odor removal.

→ Project manager for the Rend Lake Conservancy District, Illinois, 27-mgd Lime Softening Plant Upgrades. The upgraded processes include conventional rapid mixing, upflow lime softening clarifiers, and split parallel treatment using microfiltration membranes and conventional dual media filtration. Chemical systems included sodium hypochlorite, aqua ammonia, alum, fluoride, polymer, polyphosphate and lime.

→ Principal-in-charge for the City of Highland Park, Illinois, Water Treatment Plant Upgrade Design. Upgrades included raw water capacity improvements, conversion of portion of the sedimentation basins to low-pressure membranes, and chemical system improvements.

→ Principal-in-charge for planning and design of capacity upgrades to the City of Evanston, Illinois, 108-mgd Water Treatment Plant. Alternatives for capacity upgrades were microfiltration versus the addition/ rerating of dual media filters. Design improvements included rehabilitation of dual media filters, and structural and architectural improvements to the filter process area.

→ Project manager for the Lake Michigan Water Supply Project for the Central Lake County Joint Action Water Agency, Illinois. Responsible for preliminary, detailed designs, and construction-phase management of the raw water intake, pump station, water treatment plant's ozonation system, and booster pump station and standpipes.

Gamboa
Engineers Innovating with Energy and Automation

Mario A. Gamboa, P.E.
Lead Electrical Engineer
Office Location: Southwest Ranches, FL

Mr. Gamboa will be the Lead Electrical and Controls Engineer, responsible for the Master Plan, Design, and related interconnections with SCADA Systems for the plant electrical upgrades, in accordance with the City of Pompano Beach design criteria and standards, including power distribution systems from the FPL power source and medium voltage switchgear, through underground duct-banks, transformer rooms, new main electrical rooms, layout of new 480 arc resistant switchgear, motor control centers, power flow analysis, control schematics and ancillary support system such as LED lighting, grounding and lightning protection, conduit and wiring schedules, During the construction phase, Mr. Gamboa will act as the Lead Electrical Engineer, for review of submittals, response to RFIs, evaluate proposal for any changes, address construction constraints, and provide input for project schedule update.

Mr. Gamboa professional experience spans 39 years of Electrical Engineering experience in the water and wastewater field working for and with Carollo Engineers in projects and municipalities throughout the United States, Florida, including City of Pompano Beach Utilities Department

Relevant Project Experience Related to RFQ – E04-20

- ✓ **39 years in electrical engineering and related value engineering; engineering management, construction management of numerous municipal and industrial projects**
- ✓ **Substantial knowledge of the City of Pompano Beach Water Treatment Plant Power Distribution systems, including the existing 5 KV switchgear, recent upgrades to the 480 volts switchboards, motor control centers and familiar with older equipment that it is reaching the end of its useful life.**
- ✓ **Expertise with means and methods of construction for electrical and automation systems.**
- ✓ **Significant Water Treatment Plant project experience**
- ✓ **Substantial Experience in electrical design and automation of Lime Softening and RO Membrane systems**

Relevant Responsibilities	Relevant Expertise
♦ Electrical Engineering Management	♦ Compliance with Pertinent Codes and Standards
♦ Basis of Electrical Design Criteria	♦ Project Phasing & Scheduling
♦ Collaborate and Coordinate with Water Treatment Process Design and Construction Team	♦ Engineering Management of Municipal, Industrial and Commercial Projects
♦ Design of Electric Power Distribution Systems	♦ Lime Softening Systems
♦ Synchronizing of Standby Power Generator Auxiliary Support Systems	♦ Membrane Filtering System
♦ Quality Control of Electrical and Automation Design	♦ Pump Stations
♦ Testing of Electrical and SCADA systems	♦ Power Studies and Load Flows
♦ Electrical and SCADA System Start-Up & Commissioning	♦ Electrical & Instrumentation Opinion of Cost
	♦ Value Engineering of Electrical and Control Systems

- ✓ Lead electrical engineer for the City of Pompano Beach Water Treatment Lime Softening Plant, Electrical Master Plan and Urgent Improvements Phase I, II and III projects. These projects included separate phases for the design and construction to replace 5 kV power distribution Motor Control Center, 480 volts power distribution switchgear, 5 kV /480 volts transformers, replace 480 volts variable frequency drives.
- ✓ Quality control electrical engineer to assist the City of Pompano Beach Water Utilities Department with review of separate design for 600 HP pump's speed controls with 5 kV VFDs and addition of programmable logic controllers.
- ✓ Quality control electrical engineer to assist the City of Pompano Beach Water Utilities Department, with review of design documents for electrical upgrades to the west water production wellfield. The projects included 13 kV-480 volts pad mounted transformers, 13 kV cable Splitter cabinets and underground 13 kV cables.

- ✓ Lead electrical engineer for the Master Plan for Upgrades to 5 KV and 480 V Electrical System, Southwest Water Reclamation Facility, Manatee County, Bradenton, Florida. Performed inspection, condition assessment of 5 KV power distribution switchgear; 5 kV switchgear to synchronize two 2 MW generators, numerous 5 kV/480 V substation transformers, 480 V motor control centers, lighting panelboards, provided options to reduce quantity of electrical equipment, expansion of existing electrical building for installation of new equipment while maintaining the plant in continuous operation and opinion of construction cost.

- ✓ Lead electrical engineer for the design of CD 2.27 - two new 90 tons per day Vacuum Pressure Swing Adsorption (VPSA) oxygen production system, CDWWTP, Miami Dade WASD, Miami, Florida. Design includes 13 KV/5 KV substation transformers, 13 KV/480 V substation transformers, 5 KV motor starters, arc flash resistant switchgear, motor control centers, instrumentation for VPSA process control, additional DO instruments for oxygen reactors, VFDs for oxygen booster pressure blowers and interconnection with the plant SCADA system.

- ✓ Lead electrical engineer for the Southwest Water Reclamation Facility Electrical Power Distribution Improvements, City of St. Petersburg, Florida. Project included design of 12 kV switchgear, 2 - 2,000 kW -5 kV generators for standby power, 12 kV- 480 volts substation transformers, and underground duct-banks and electrical manholes.

- ✓ Lead electrical engineer for Northwood Water Treatment Plant, Electrical Power Distribution Assessment, City of North Miami Beach, Florida. Project included assessment of FPL redundant 13 KV electric services and their interconnections with existing 480 volts power distribution switchgear to assure power reliability. Gamboa Engineers coordinated with FPL the required modifications to existing 13 kV pad mounted switches.

- ✓ Lead electrical engineer for the Central County Water Reclamation Facility Phase 2 Expansion and Main Lift Station Upgrade, Sarasota County Utilities Department, Florida. Project included design of an upgrade to the 480 volts power distribution and SCADA system with additional FP&L utility, transformers, a 480 volts-4000 A switchgear with provisions to synchronize two 1200 KW generators, motor control centers, underground duct-banks. pumps with variable frequency (speed) controllers, and new programmable controllers.

- ✓ Lead Electrical engineer for the South-Central Regional Water Reclamation Facility, Blowers and Efficiency Upgrades Project, Delray Beach, Florida. Design included new 400 hp aeration blowers and its interconnection to 5 KV motor control centers, additional 480 volts motor starters in motor control centers, new instrumentation for monitoring and control of aeration process system, new PLCs and its interconnection with the plant SCADA system.

- ✓ Lead electrical engineer for the City of Plantation Regional Wastewater Plant and Central Water Plant Pump Speed Controller Upgrade project, City of Plantation Utilities Department, Florida. Design included new 480 volts MCCs, VFDs, underground duct-banks, electric manholes, new programmable automation controllers, and temporary power provisions to maintain the existing plant in continuous operation. Wastewater processes included modifications to the existing deep well pumps, RAS pumps, and water storage transfer pumps.

- ✓ QA/QC for the Manatee County, Florida, Southeast Regional Water Reclamation Facility and North Regional Water Reclamation Facility Electrical Master Plans. The project guided the development of electrical projects targeted to deal with aging infrastructure and population increase.

- ✓ Electrical engineer for Odessa and US 41 Booster Pumping Stations – Pressure Modifications Projects, Tampa Bay Water. Project includes Analysis of utility power, switchboard, 250 HP VFDs, 75 HP VFDs and standby power generator, to comply with NFPA-72E and electrical system modifications.

- ✓ Lead electrical engineer for design of co- generator controls to synchronize two methane gas cogeneration units with six standby diesel generator units. This work included retrofit of existing 480-volt generators to synchronize 3MW of on-site generators with the utility 12-k service at Union Sanitary District, Alvarado Wastewater Treatment Facility, Union City, California.

Office Location

Sarasota, FL

Education

PhD Civil Engineering, University of Texas, Austin, 1993

MS Civil Engineering, University of Texas, Austin, 1990

BS Petroleum Engineering, University of Texas, Austin, 1984

Licenses

Professional Engineer, Florida, Illinois, North Carolina, South Carolina, Virginia

Professional Affiliations

American Academy of Environmental Engineers, Board Certified Environmental Engineer

American Water Works Association, (AWWA) Florida Section AWWA

- Founding Chair Region 10

Founding Director International Ultraviolet Association

Water Environment Federation

Reviewer for: ASCE Journal of Environmental Engineering
Environmental Science and Technology
Journal of the American Waterworks Association
Water Research

Robert S. Cushing, PhD, PE, BCEE

Dr. Robert Cushing is senior vice president with Carollo. He has 30 years of experience in applied environmental science and engineering. Throughout his career, Bob 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.

Bob is an internationally recognized expert in water quality and treatment having authored over 100 publications and presentations. He has practiced nationally, providing service to a broad cross-section of the industry, from some of the largest utilities (e.g., New York City and Washington, D.C.) to very small applications with important and unique issues (e.g., Ouray National Fish Hatchery, Utah).

Relevant Experience

→ Technical advisor for the City of Boynton Beach, Florida, MIEX System. This project involved a new organics removal MIEX system for Western Wellfield water with the use of excess treatment capacity for hardness removal at the EWTP. Western Wellfield water will be pumped to the East WTP, where the new 16-mgd MIEX system (expandable to 20-mgd) will utilize a proprietary anion exchange resin to remove organics. This MIEX treated water will then be treated in the softening basins, as well as partially bypassed around the softeners to ultimately increase the EWTP capacity.

→ Technical advisor for the City of Boynton Beach, Florida, Utilities Management Optimization Plan. This project consists of developing a model to calculate real time rates, CIP (budget, cash flow, expenditures), budget status, provide GIS access, and modeling of water, sewer, stormwater, and reuse. Model should also answer whether to expand, repair, or upgrade due to new regulations, and what the potential cost impact will be.

→ Technical advisor for the City of Sunrise, Florida, Sawgrass Water Treatment Plant Ion Exchange project. The treatment scheme conserves water and lowers cost relative to utilizing NF membrane treatment, which also increases the overall facility water recovery. The potable water is also improved as the blended water is higher in hardness and alkalinity, which will result in better water quality and will minimize the distribution system's corrosion potential.

→ Technical advisor for the design of the Miami-Dade Water and Sewer Department, Florida, 225-mgd Hialeah and Water Treatment Plants. This project identified and recommended process modifications and improvements to the conventional softening water treatment plants on the existing site or remotely to address a reclassification of one of the water sources as Ground Water Under the Direct Influence of Surface Water.

→ Technical advisor and project director for the 54-mgd ultrafiltration (UF) Lake Manatee Water Treatment Plant, Manatee County, Florida. Project included design and construction phase engineering services for the retrofit of media filters at the plant. At time of design, this represented the largest MF/UF retrofit in the US and Florida's largest low-pressure membrane facility. Project components included: new pre-screens, UF membrane system, backwash system, CIP system, and integration with existing infrastructure. Key tasks include evaluation of existing pretreatment for compatibility with UF, prequalification of membrane system suppliers, predesign and membrane procurement documents, membrane supplier evaluation and selection, pilot testing, permitting, final design, construction phase services, and start-up and warranty.

→ Principal-in-charge for the preliminary expansion design for the City of Venice Gardens, Florida, Water Treatment Facility. The preliminary engineering report was generated to obtain the construction permit prior to detailed design. The expansion of the facility includes upgrades and expansion

Robert S. Cushing, PhD, PE, BCEE

of five existing membrane trains, including conversion from single stage to two stage arrays and the addition of interstage boost energy recovery devices for flux balancing and energy savings. New post treatment facilities include a new degasifier and chemical scrubber for hydrogen sulfide removal, a carbon dioxide solution feed system for pre-degasifier pH adjustment, and post treatment alkalinity recovery. The carbon dioxide system, in conjunction with a new scale inhibitor system, allows for acid free operation of the RO system.

→ Technical advisor for the Collier County, Florida, Northeast Regional Water Treatment Plant. This $70-million Greenfield 10-mgd brackish RO treatment plant (expandable to 40-mgd) includes a design that must respond to degrading water quality and more than 8-mg/L of hydrogen sulfide. Key features of the RO design include no-acid pretreatment, noise isolation of the RO feed pumping, accessibility to all instruments and valves, and pressure exchanges for energy recovery.

→ Principal-in-charge for the City of Palm Coast, Florida, Nanofiltration Water Treatment Plant expansion from 2.5 to 9.6-mgd. Florida Water Services selected Carollo and Harn R/O Systems as the design build team to design, permit, and construct the expansion in a challenging schedule of only 13 months. Design build services included the re-design of existing nanofiltration equipment and chemical feed systems, the addition of four additional membrane trains, and two additional degasification towers. Re-design of the existing process saves the owner approximately $100,000 per year in O&M costs by taking advantage of new technology that was not available when the plant was originally constructed in 1992.

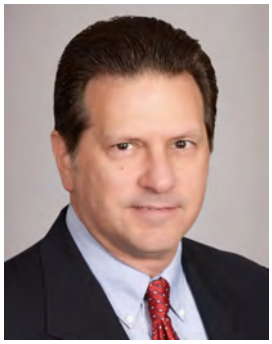
→ Principal-in-charge for the expansion of South Island Public Service District, South Carolina, Water Treatment Plant from 1.5 to 3 mgd. The expansion included the evaluation of how to maximize the use of South Island Public Service District's existing reverse osmosis equipment and evaluation of the electrical and mechanical infrastructure to assess any required upgrades. Carollo developed designs and specifications for new reverse osmosis treatment equipment and associated electrical and mechanical system upgrades, as well as the pretreatment equipment that included a heat exchanger and cooling tower process, used to cool South Island Public Service District's geothermal, brackish groundwater from 122°F to 104°F.

→ Principal-in-charge for the design/build delivery of the Florida Government Utility Authority, Florida, Golden Gate Water Treatment Plant Reverse Osmosis Expansion - Phase III. Carollo served as the Engineer of Record and provided engineering service related to permitting, shop drawing review, and construction inspection.

→ Principal-in-charge for the preliminary design of the Town of Ave Maria, Florida, Reverse Osmosis Water Treatment Plant. The project involves a new 1.5-mgd Water Treatment Plant located on a new site that provides water for a new community development. Ultimate site capacity requires that infrastructure be provided for expansion to 9-mgd. Reverse osmosis system designed to remove hardness and color from an iron contaminated anaerobic groundwater supply.

→ Technical director for the master plan of United Water Florida's St. Johns Forest River System. This project consisted of the evaluation of three treatment options, RO, NF, and EDR, to treat a 5-mgd brackish groundwater supply. Of key concern was the mitigation of impacts associated with shallow aquifer use on local wetlands and disposal of concentrated by-product water.

→ Technical advisor for the three Santa Clara Valley Water District, California, Water Treatment Plants with the ultimate capacities of 40-mgd, 100-mgd, and 120-mgd. Basis of design criteria were developed and design considerations prepared, including hydraulics, layouts, and electrical aspects for both low-pressure high output and medium-pressure systems.



Mark A. Pellish, PE

Mark Pellish specializes in electrical engineering projects. He has served as a professional engineer in the areas of design and permitting and bidding and construction. As a project electrical engineer, Mark's expertise consists of the design of electrical power distribution systems for water and wastewater treatment plants, pump stations, manufacturing plants, office buildings, warehouses, and other commercial and industrial facilities.

Office Location

Orlando, FL

Education

BS Electrical Engineering, Lehigh University, 1985

Licenses

Professional Engineer, Florida, Pennsylvania, Arkansas

Professional Affiliations

National Society of Professional Engineers
Florida Engineering Society

Relevant Experience

→ Electrical engineer for the Seminole County, Florida, Markham Regional Water Treatment Plant Upgrades. Responsible for design of an expansion and upgrade of the Markham Regional Water Treatment Plant to include ozonation for hydrogen sulfide removal and ion exchange for reducing total organic carbon. The expansion also included a new 1.5-MG ground storage tank, new chlorine and fluoride storage and feed systems, additional high service pumps, and standby electrical generators to provide capacity for treating 17.28 mgd. The project also included a new operations building designed to meet the Florida Green Building Coalition certification standards.

→ Electrical engineer for the Tampa Electric Company, Florida, TEC Polk Power Station RO Water Treatment Plant. Responsible for design of a new reverse osmosis water treatment plant. Includes underground 4,160-volt service to medium voltage switchgear, three 2,000 KVA service transformers, double-ended 5000 amp, 480-volt main switchgear, multiple variable frequency drives for various motors, five motor control centers for constant speed pumps, lighting, grounding, lightning protection, and DCS controls.

→ Electrical engineer for the City of Oldsmar, Florida, RO Water Treatment Plant. Responsible for the electrical design of a new 4-mgd reverse osmosis water treatment plant and six remote well sites. The design included 2,400-amp electrical service, two 750 KW standby diesel generators with automatic transfer switches, 480-volt distribution switchgear, motor control centers, and variable frequency drives for three 200-hp RO feed pumps and three 50 hp booster pumps. The design also included interior and exterior lighting, lightning protection, grounding, and LEED-certification of the combined RO process and administration office building.

→ Electrical engineer for the Pinellas County, Florida, Pinellas County WTE Water Treatment Plant. Responsible for the design of a new water treatment plant using reverse osmosis and microfilter technologies. Includes two 1600-amp motor control centers, provisions for portable standby generator hookup, variable frequency drives for RO feed and booster pump motors, lighting, grounding, lightning protection, and controls.

→ Electrical engineer for the Peace River Water Authority, Florida, Peace River Facility Expansion. Responsible for additions to the power distribution system. Upgraded the incoming 23-KV electrical service and added 23-KV switchgear, pad mounted transformers, and 480 volts distribution equipment throughout the facility. Included medium voltage starters for 500 hp pumps, variable frequency drives, motor control centers, and reduced-voltage solid-state starters for 100 hp, 200 hp and 300 hp pump motors. Also included one 1,400 KW and two 1,250 kW standby generators, and new generator control switchgear. Scope of services included planning, design, and construction-phase services.

→ Electrical engineer for the City of Clermont, Florida, Sunburst Lane Water Treatment Plant System Upgrades. Responsible for the design of a water treatment plant upgrade, including new electrical service and new standby generator. Scope of services included design for Phase II expansion of the Sunburst Lane Water Treatment Plant. Team members were responsible for a new 2-MG ground storage tank with cascade tray aerator; pump station with motor control center and four high-service pumps and water piping.

Mark Pellish, P.E.

→ Electrical engineer for the City of Leesburg, Florida, Royal Highlands Water Treatment Plant HSP Station. Responsible for the design of addition of high service pumps to a water treatment plant.

→ Electrical engineer for the Seminole County, Florida, Markham Regional Water Treatment Plant Phase IIB Expansion. Responsible for the design of water treatment plant expansion, including a new standby generator, motor control center and solid-state reduced voltage motor starters.

→ Electrical engineer for the City of Clermont, Florida, Greater Hills Water Treatment Plant. Responsible for upgrades to a water treatment plant and three remote well sites, including new electrical service and standby generator.

→ Electrical engineer for the City of Oviedo, Florida, Mitchell Hammock Water Treatment Facility. Responsible for the design of a 3,000-amp main switchboard, 600-amp motor control centers, and variable frequency drives for 125-hp transfer pumps and 300-hp high service pumps. Scope of services included preliminary and final engineering design services for the City's new 10-mgd Mitchell Hammock Water Treatment Facility. The facility was designed to treat groundwater containing hydrogen sulfide using a forced-draft aeration process and it was master planned for future expansion that includes nanofiltration.

→ Electrical engineer for Sarasota County, Florida, Venice Gardens Water Treatment Plant Upgrade. Responsible for the design of a water treatment plant upgrade, including new electrical service, new standby generator, high service pumps with variable frequency drives and controls.

→ Project manager for the City of Apopka, Florida Grossenbacher Water Treatment Plant Variable Frequency Drives Upgrades. Responsible for the coordination of the project and the electrical design of the project. Was also responsible for the design of a new 2,000-amp main switchboard, four 200 hp variable frequency drives, a new reduced voltage solid-state starter for a 200-hp well pump and a motor control center. Scope of services included improvements to the operation of the existing high service pumps at the Grossenbacher WTP, modifying a portion of the high service pump room for electrical equipment.

→ Project engineer for Seminole County, Florida, Markham Regional Water Treatment Plant Phase IIA. Responsible for the electrical design of the project. Scope of services included design of expansion of the Markham Regional Water Treatment Plant for Seminole County. Final design included addition of new ground storage tank, two new high service pumps with variable frequency drives, and additional chemical feed equipment.

→ Electrical engineer for Brevard County, Florida, Barefoot Bay Water Treatment Plant Expansion Final Design. Responsible for design of a water treatment plant expansion, including upgraded electrical service and new standby generator.

→ Electrical engineer for Orange County, Orlando, Florida, Eastern Regional Water Supply Facility. Responsible for the design which added two 200-hp well pumps to the existing system. Included were two loop-fed 300-KVA, 4160V-480V pad mounted transformers, motor control centers and reduced-voltage solid state starters for the well pumps.

→ Electrical engineer for Peace River Water Authority, Arcadia, Florida, Peace River Option. Responsible for additions to the 23 KV and 480-volt distribution system between the plant and remote pump stations and wellfields. Added variable frequency drives and reduced-voltage solid-state starters for 100 hp, 200 hp and 300 hp pump motors. There was a 600-amp motor control center added for miscellaneous motor loads and six loop-fed 150 KVA, 23KV-480V step down transformers for ASR wellfield pumps. Scope of services included planning, design, and construction-phase services for expansion of a surface water treatment plant, addition of aquifer storage-recovery wells, raw water pumping and transmission and reservoir pumping and pipeline.

design kollaborative
architects / planners, inc.
AA C000554

Andre Capi

Andre Capi Director and Owner, received his Master Degree in Architecture at Tulane University, New Orleans. With more than 24 years' experience and excellent communication skills he coordinates planning design and design- build projects. He provides complete project services, overseeing all aspects of the Architecture firm from evaluation though design, quality control and construction of commercial, industrial, historical and residential projects. Permitting is facilitated by his extensive knowledge of building codes, planning and zoning ordinances and approval processes nationwide. As well as being LEED Certified and Leading the Company's Environmental and sustainable initiatives, Mr. Capi is a member of Florida Trust Historical Preservation and Leads the companies restoration, renovation and adaptive re-use efforts.

Education

Masters of Architecture from Tulane School of Architecture, New Orleans, LA 1988

Alumni Cardinal Gibbons High School Ft. Lauderdale, FL

Professional Memberships

Florida Trust for Historic Preservation

US Green Building Council

American Institute of Architects

LEED Accredited

Qualifications

LEED AP Certified Extensive knowledge of Building Codes and Planning and Zoning ordinances and permit processes nationwide Experienced in site evaluation (Due Diligence reports/ site feasibility studies for Ground up Construction, remodels, site planning. Office management skills consist of contracts, billing, scheduling and time tracking.

Relevant Experience

Historic Building/ Bailey Hotel Rehabilitation
Ali Cultural Center
Ali Block Development Site plan
165 Kitchen
CRA Office Remodel
Urban Farm
North Pompano Park Community Center
Briney Avenue Utility Underground and Streetscape Improvements
Sample McDougald House
Pompano Pier Renovation
East CRA Master Plan Design Survey
NW Neighborhood Sidewalks project
Old Pompano Civic

Andre Capi
President / Owner DK Architects

Professional Experience

1989 - Present
Design Kollaborative Architects/ Planners, Inc. Pompano Beach. FL Director of Architecture.
Historical Renovations for the City of Pompano Beach including the
Design-build community Development multi-family (condominium, townhouse, apartment and mixed-use) and affordable housing projects in Pompano Beach.

LEED AP Certified
Extensive knowledge of building codes and Planning and Zoning ordinances and permit processes nationwide
Experienced in site evaluation (due diligence reports / site feasibility studies) for ground up construction, remodels and site planning.
Office management skills (contracts, billing, scheduling, time tracking)

Philanthropic Affiliations

PACE Broward Pace Setter, Junior Achievement – Construction Committee, proud contributor to: A Child Is Missing, American Cancer Society, American Heart Assoc., Boys and Girls Club of Broward and Palm Beach Counties, Broward Outreach Center, Children's Diagnostic and Treatment Center, Cystic Fibrosis Foundation, Humane Society of Broward County, National Multiple Sclerosis Society, Jessica June Cancer Foundation, Kids in Distress, Leukemia and Lymphoma Society, Red Cross, Riverwalk Trust and Young Professionals for Covenant House

RESUME'

Name: R. N. Sailappan, P.E.

Education: B.S. (Naval Architecture), Cochin University of Science & Technology, Cochin, India, 1986
M.S. (Civil Engineering), Florida Atlantic University, Boca Raton, FL, 1991

Licenses: Professional Engineer, Registered in the State of Florida, 1993

Associations: Member, American Society for Testing of Materials (ASTM), 2010
Member, American Society of Civil Engineers (ASCE), 1994
Member (Former), Institution of Naval Architects (INA), India, 1987

Work Experience:

1998 - Present	Principal Quest Engineering Services & Testing, Inc. Pompano Beach, Florida.
1990 - 1998	Engineer & Manager Professional Service Industries, Inc. West Palm Beach, Ft. Lauderdale, Miami, FL
1988 - 1990	Graduate Research Assistant Dept. of Ocean Engineering, Florida Atlantic University Boca Raton, Florida
1986 - 1988	Naval Architect Mazagon Dock Ltd., Mumbai (Bombay), India

Relevant Skills: Geotechnical Studies and Foundation Design Recommendations
Foundation Installation Inspections & Pile Load Tests
Field and Laboratory Tests on Soil, Concrete, Masonry, Asphalt
Structural (Special/Threshold) Inspections
Environmental Site Assessments
Project Management, Marketing, Business Development

Relevant Projects: Miramar East Water Treatment Plant, Miramar, FL
Sawgrass Water Treatment Plant, Sunrise, FL
North Broward Waste Water Treatment Plant, Pompano Beach, FL
Utility Improvements, City of Sunrise, FL
Miami-Dade Water & Sewer Utility Improvements, Dade County, FL
Ft. Lauderdale/Hollywood International Airport, Ft. Lauderdale, FL

Publications

D. V. Reddy and R. N. Sailappan, "Acoustic Emission as a NDE Tool - Certain Laboratory and Field Investigations", December 1989.

D. V. Reddy, S. K. Lee, R. N. Sailappan, W. H. Hartt & M. Arockiasamy, "Fracture Mechanics Evaluation of the Durability of Fly Ash Concrete", December, 1991.

D. V. Reddy, S. K. Lee, R. N. Sailappan, W. Ahn, G. V. Jeedigunta, and K. P. Bethune, "Corrosion Resistance and Fracture Toughness of High Performance Concrete in the Marine Environment", May-June 1998.

Mr. Sailappan has over 30 years of engineering industry experience, with 28 of those years being in South Florida. He has worked on hundreds of projects such as roadways, utilities, public facilities, commercial projects, residential projects, stadiums and arenas, providing construction materials testing, geotechnical engineering, structural inspections, wind load evaluations as well as engineering consultations with regard to roofing, ground vibrations, light and sound analysis.

7. References

When you contact our references, we are confident you will hear phrases describing our services that include the words "innovation," "responsiveness," and "integrity."

As requested in the RFQ, we have provided references for three similar projects in the tri-county area (Broward, Palm Beach, and Miami-Dade). **We encourage you to contact them to learn more about their experience with us.**

Three References that Testify to the Quality of Our Team's Work

Reference Information	Client/Project Name	Scope of the Project/Carollo's Responsibilities	Cost
Steve Doyle, Construction Project Management Supervisor 954-831-0962 sdoyle@broward.org	Broward County, Ft. Lauderdale, FL, New Electrical Systems for Broward County Pump Stations	Carollo was selected to provide planning, design, and construction phase services for three of Broward County's high service pump stations, including new electrical power feeds, power distribution, a new electrical room, and standby power. A summary of the electrical work at each site is as follows: **District 3A:** Carollo and Gamboa Engineers designed a new electrical system, including: a new 13-kV transformer, an electrical room with air conditioning, a double-ended switchboard with a tie-breaker in the middle, a Tier 2 engine generator with a fuel tank, a fiber optic loop around the property, and the latest VFD technology for 200 HP pumps. **District 1B1:** A new power feed was designed for the pump station, which included up to 6-foot wide duct banks. Work includes a new transformer on a new easement with FPL, an air conditioned electrical room, a double ended switchboard, new MCC and PLC, a Tier 2 engine generator with a fuel tank, and the latest VFD technology for 125 HP pumps. **District 2A:** Carollo and Gamboa Engineers provided master planning services for a new high service pump station and electrical building at Site 2A. The new pump station features 500 HP pumps with VFDs and advanced controls. Carollo provided design recommendations for a new electrical building that includes 13-kV, 5-kV, and 480-V electrical equipment to distribute power throughout the plant. Standby generators were also included in the design.	$4 Million (Design); $27.3 Million (Construction)
Chris Catlin, Water Operations Consultant for NMB Water/Jacobs 651-491-1242 chris.catlin@jacobs.com	City of North Miami Beach and NMB Water, FL Electrical Design Services for Water Treatment Facilities	Carollo provided electrical planning and design services for the City of North Miami Beach and NMB Water, which is the water utility serving the region. Carollo and Gamboa Engineers played a key role in solving several electrical and controls challenges at the Norwood WTP.	$100,000 (Design)

Reference Information	Client/Project Name	Scope of the Project/Carollo's Responsibilities	Cost
Timothy Welch, Director of Utilities 954-888-6055 twelch@sunrisefl.gov	City of Sunrise, FL, Electrical Improvements at the Sawgrass WTP	Carollo provided design and construction administration services for ion exchange improvements project at the Sawgrass WTP. Work included a new Electrical/Chemical Building with state of the art electrical and controls equipment. A new power feed was routed over 1,000 feet from a new 600 amp breaker to the new electrical building. The main electrical room is air conditioned and includes space for maintenance activities. It includes a new transformer, MCC, control panels, power panels, lighting panels, an air handling unit, and access control features. The new electrical system provides power and controls for over 100 water treatment devices, each with associated control logic and alarms. New control panels were designed with large touch screens and SCADA interface. New VFDs were provided for advanced pump control.	$680,000 (Design); $8.9 Million (Construction)

Carollo has successfully completed a number of projects for the City of Pompano Beach since completing the Electrical Master Plan in 2012. Our team is very familiar with your facilities and permitting requirements, and, most importantly, we have established working relationships with your staff. As requested, we have summarized our past projects in the table below.

Carollo's Prior Projects with the City of Pompano Beach

Project	Role	Engineering Disciplines	Design Fee	Construction Cost
Concentrate Pipeline Assessment	Prime	C, E, PM	$13,500	N/A
Design of Membrane Concentrate Pipeline	Prime	C, E, PM, CM	$46,859	$100,000
Electrical Master Plan - Phases I and II, and Design	Prime	E, H, S	$227,995	N/A
Lime versus Nanofiltration Water Treatment Plant Evaluation	Prime	A, C, E, H, PM, S	$51,845	N/A
Concentrate Blending Study	Prime	PM	$24,983	N/A
Electrical Master Plan Misc Design/Construction Services	Prime	E, H, PM, S	$198,000	$1.7 Million
Power Supply for the UFO Office	Prime	C, E	$26,600	$200,000
Reuse Treatment Plant Permit Renewal	Prime	PM	$59,264	N/A
Transfer Pump Station - Additional Services	Prime	A, E, H, PM, S	$33,500	N/A
Water Master Plan	Prime	E, H, PM, S	$197,866	N/A
Water Supply Facilities Work Plan 2018 Update	Prime	C, PM	$66,046	N/A
WTP Transfer Pump Station Improvements	Prime	A, C, E, H, PM, S	$99,707	$2 Million
Hurricane Hardening of HSP 5-6 Building	Prime	A, E, H, PM, S	$71,500	$600,000

Engineering Disciplines:
A=Architectural, C=Civil, CM=Construction Management, E=Electrical, H=HVAC, P=Plumbing, PM=Process Mechanical, S=Structural

8. Office Locations

Carollo's Coral Springs office is approximately 9.9 miles away from the Pompano WTP on NE 3rd Avenue.

Carollo will provide responsive service from our Coral Springs office, which is 9.9 miles away from the City's WTP. We currently have 20 staff to serve the City from our Coral Springs and West Palm Beach offices, and this team has met nearly every need on your past projects with very few exceptions.

In addition to Gamboa Engineers, which in located in Southwest Ranches, FL, Carollo will be assisted by three Pompano Beach-based firms: DK Architects, Compass Point Surveyors and Quest Engineering Services & Testing.

Below is a map that shows the office locations.

Carollo's Local Office Location

2728 North University Drive,
Building 2700
Coral Springs, Florida 33065
Ph: 954-837-0030 | Fax: 954-837-0035

– Professional Staff: 6
– Administrative Staff: 1

Gamboa Engineers, LLC
17433 SW 65 CT
Southwest Ranches, FL 33331
Ph: 954-533-1121
– 6 Professional Staff
– 1 Administrative Staff

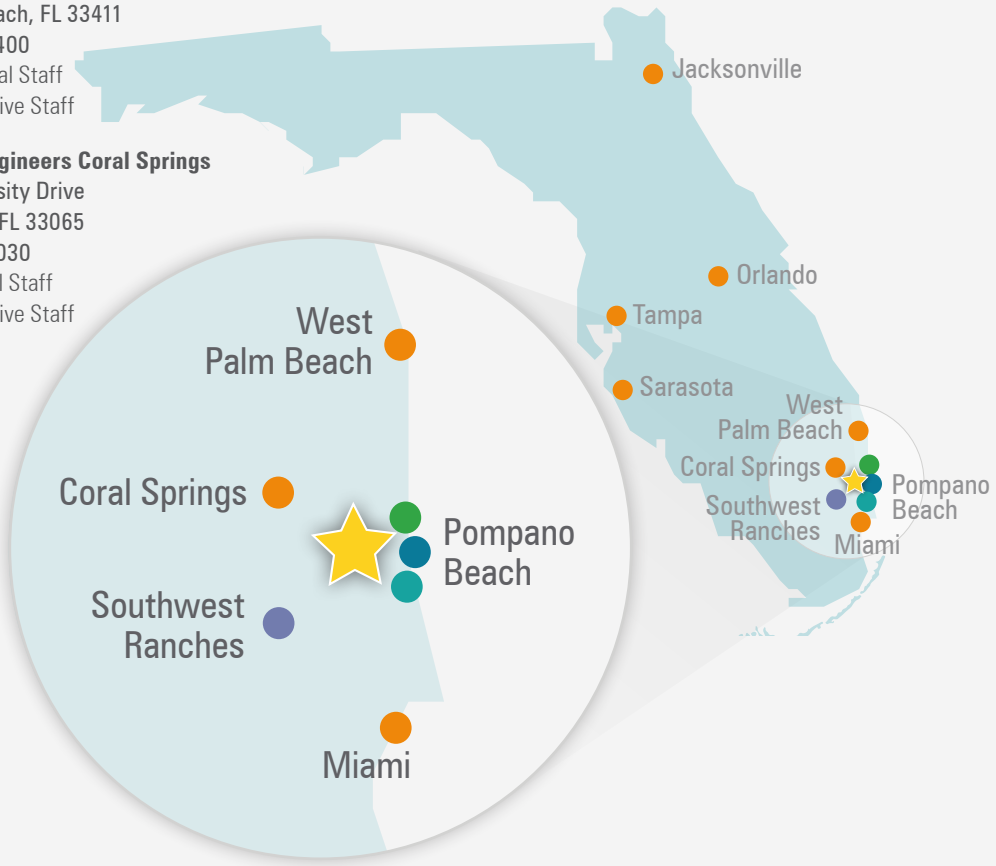
DK Architects
61 NE 1st Street, Suite 2
Pompano Beach, FL 33060
Ph: 954-941-3329
– 3 Professional Staff
– 1 Administrative Staff

Compass Point Surveyors, PL
3195 N. Powerline Road #112
Pompano Beach, Florida 33069
Ph: 954-332-8181
– 9 Professional Staff
– 2 Administrative Staff

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL 33069
Ph: 954-582-9800
– 7 Professional Staff
– 3 Administrative Staff

Carollo Engineers West Palm Beach
2056 Vista Pkwy Suite 400
West Palm Beach, FL 33411
Ph: 561-868-6400
– 12 Professional Staff
– 1 Administrative Staff

Carollo Engineers Coral Springs
2728 N University Drive
Coral Springs, FL 33065
Ph: 954-837-0030
– 6 Professional Staff
– 1 Administrative Staff



LOCAL BUSINESS EXHIBIT "A"
CITY OF POMPANO BEACH, FLORIDA
LOCAL BUSINESS PARTICIPATION FORM

Solicitation Number & Title: E-04-20, Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System Prime Contractor's Name: Carollo Engineers, Inc.

Name of Firm, Address	Contact Person, Telephone Number	Type of Work to be Performed/Material to be Purchased	Contract Amount or %
DK Architects	954-941-3329	Architecture, Site Plan, Permitting	TBD*
61 NE 1st St., Suite 2, Pompano Beach, FL 33060			
Compass Point Surveyors, PL	954-332-8181	Surveying	TBD*
3195 N. Powerline Rd #112, Pompano Beach, FL 33069			
Quest Engineering Services & Testing, Inc.	954-582-9800	Geotechnical	TBD*
2737 NW 19th St., Pompano Beach, FL 33069			

LOCAL BUSINESS EXHIBIT "A"

*Carollo is committed to meeting the required goal of 10% local business participation. The actual breakdown will be determined in the future.

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

New building facility design and site planning, permitting, LEED certification, and construction administration.

at the following price: T.B.D.

02-11-2020
(Date)

Design Kollaborative Architects/Planners,
(Print Name of Local Business Contractor)
61 NE 1st Street, Suite 2
(Street Address)
Pompano Beach, FL 33060
(City, State, Zip Code)
BY: _____
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

Surveying Services

at the following price: TBD

02-17-2020
(Date)

Compass Point Surveyors, PL
(Print Name of Local Business Contractor)
3195 N. Powerline Road #112
(Street Address)
Pompano Beach, Fl 33069
(City, State Zip Code)

BY: _____
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

Geotechnical Engineering, Construction Materials Testing and Special (Structural) Inspection Services

at the following price: _____

February 4, 2020
(Date)

Quest Engineering Services & Testing, In
(Print Name of Local Business Contractor)
2737 NW 19 Street
(Street Address)
Pompano Beach, FL - 33069
(City, State Zip Code)
BY: K. N. Sailappan
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

N/A

LOCAL BUSINESS EXHIBIT "C

LOCAL BUSINESS
UNAVAILABILITY FORM

BID # E-04-20

I,_____
(Name and Title)

of_____, certify that on the _____day of

_____, _____, I invited the following LOCAL BUSINESSES to bid work items to be performed in the City of Pompano Beach:

Business Name, Address	Work Items Sought	Form of Bid Sought (i.e., Unit Price, Materials/Labor, Labor Only, etc.)

Said Local Businesses:

☐ Did not bid in response to the invitation

☐ Submitted a bid which was not the low responsible bid

☐ Other:_____

Name and Title: _____

Date: _____

Note: Attach additional documents as available.

LOCAL BUSINESS EXHIBIT "D"
GOOD FAITH EFFORT REPORT
LOCAL BUSINESS PARTICIPATION

BID # E-04-20

1. What portions of the contract have you identified as Local Business opportunities?

Architecture, Site Plan, Permitting

Surveying

Geotechnical

2. Did you provide adequate information to identified Local Businesses? Please comment on how you provided this information.

Yes

3. Did you send written notices to Local Businesses?

☐ Yes ☑ No

If yes, please include copy of the notice and the list of individuals who were forwarded copies of the notices.

4. Did you advertise in local publications?

☐ Yes ☑ No

If yes, please attach copies of the ads, including name and dates of publication.

5. What type of efforts did you make to assist Local Businesses in contracting with you ?

Emails and phone calls

7. List the Local Businesses you will utilize and subcontract amount.

DK Architects	$TBD*
Compass Point Surveyors, PL	$TBD*
Quest Engineering Services & Testing, Inc.	$TBD*

*Carollo is committed to meeting the required goal of 10% local business participation. The actual breakdown will be determined in the future.

8. Other comments: _____

LOCAL BUSINESS EXHIBIT “D” – Page 2

_____

_____

_____

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 – 954-831-4000

VALID OCTOBER 1, 2019 THROUGH SEPTEMBER 30, 2020

DBA:
Business Name: D K ARCHITECTS PLANNERS INC

Receipt #: 315-291
Business Type: ENGINEER (CORP ARCHITECT/PLANNERS)

Owner Name: D K ARCHITECTS PLANNERS INC
Business Location: 24 NE 24 AVE
POMPANO BEACH

Business Opened: 12/17/1998
State/County/Cert/Reg: AR-6329
Exemption Code:

Business Phone:

Rooms	Seats	Employees	Machines	Professionals
		5		

For Vending Business Only

Number of Machines: **Vending Type:**

Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid
30.00	0.00	0.00	0.00	0.00	0.00	30.00

THIS RECEIPT MUST BE POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS

THIS BECOMES A TAX RECEIPT

WHEN VALIDATED

This tax is levied for the privilege of doing business within Broward County and is non-regulatory in nature. You must meet all County and/or Municipality planning and zoning requirements. This Business Tax Receipt must be transferred when the business is sold, business name has changed or you have moved the business location. This receipt does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.

Mailing Address:

D K ARCHITECTS PLANNERS INC
24 NE 24 AVE
POMPANO BEACH, FL 33062

Receipt #1CP-18-00009097
Paid 07/12/2019 30.00
07/11/2019 Effective Date

2019 - 2020

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

pompano beach
Florida's Warmest Welcome

CITY OF POMPANO BEACH
BUSINESS TAX RECEIPT
FISCAL YEAR: 2019 - 2020

Business Tax Receipt Valid from: October 1, 2019 through September 30, 2020

4459900 9/18/2019
COMPASS POINT SURVEYORS PL
3195 N POWERLINE RD #112

POMPANO BEACH FL 33069

THIS IS NOT A BILL

THIS IS YOUR BUSINESS TAX RECEIPT. PLEASE POST IN A CONSPICUOUS PLACE AT THE BUSINESS LOCATION.

BUSINESS OWNER: COMPASS POINT SURVEYORS PL
BUSINESS LOCATION: 3195 N POWERLINE RD 112 POMPANO BEACH FL

RECEIPT NO:	**CLASSIFICATION**
20-00087031	**PROFESSIONAL OFFICE (SEE REQUIREMENTS)**

NOTICE: A NEW APPLICATON MUST BE FILED IF THE BUSINESS NAME, OWNERSHIP OR ADDRESS IS CHANGED. THE ISSUANCE OF A BUSINESS TAX RECEIPT SHALL NOT BE DEEMED A WAIVER OF ANY PROVISION OF THE CITY CODE NOR SHALL THE ISSUANCE OF A BUSINESS TAX RECEIPT BE CONSTRUED TO BE A JUDGEMENT OF THE CITY AS TO THE COMPETENCE OF THE APPLICANT TO TRANSACT BUSINESS. **THIS DOCUMENT CANNOT BE ALTERED**.

BUSINESS TAX RECEIPTS EXPIRE SEPTEMBER 30TH OF EACH YEAR

pompano beach
Florida's Warmest Welcome

CITY OF POMPANO BEACH
BUSINESS TAX RECEIPT
FISCAL YEAR: 2019 - 2020

Business Tax Receipt Valid from: October 1, 2019 through September 30, 2020

4441289 9/24/2019
QUEST ENGINEERING SERVICES
& TESTING INC
2737 NW 19 ST
POMPANO BEACH FL 33069

THIS IS NOT A BILL

THIS IS YOUR BUSINESS TAX RECEIPT. PLEASE POST IN A CONSPICUOUS PLACE AT THE BUSINESS LOCATION.

BUSINESS OWNER: QUEST ENGINEERING SERVICES &
BUSINESS LOCATION: 2737 NW 19 ST POMPANO BEACH FL

RECEIPT NO:	**CLASSIFICATION**
20-00065333	**PROFESSIONAL OFFICE (SEE REQUIREMENTS)**

NOTICE: A NEW APPLICATON MUST BE FILED IF THE BUSINESS NAME, OWNERSHIP OR ADDRESS IS CHANGED. THE ISSUANCE OF A BUSINESS TAX RECEIPT SHALL NOT BE DEEMED A WAIVER OF ANY PROVISION OF THE CITY CODE NOR SHALL THE ISSUANCE OF A BUSINESS TAX RECEIPT BE CONSTRUED TO BE A JUDGEMENT OF THE CITY AS TO THE COMPETENCE OF THE APPLICANT TO TRANSACT BUSINESS. **THIS DOCUMENT CANNOT BE ALTERED**.

BUSINESS TAX RECEIPTS EXPIRE SEPTEMBER 30TH OF EACH YEAR

10. Minority Business Enterprises

Carollo will include two certified Minority Business Enterprises (MBEs) on our team: Gamboa Engineers, LLC, and Quest Engineering Services & Testing, Inc. We have included MBE certificates for each firm below. Gamboa Engineers has partnered with Carollo for all of our project for the City of Pompano Beach, with various percentages of participation depending on the scope of the work. For this project, we anticipate that Gamboa Engineers will have the majority role as the scope of work is primarily an electrical engineering based project.

Carollo's Two Minority Business Enterprises for the Electrical Master Plan Update

Fim Name	Type of Service	Percentage of Work
Gamboa Engineers, LLC 17433 SW 65 CT, Southwest Ranches, FL 33331 Ph: 954-533-1121 | mgamboa@gamboainc.com	Electrical Engineering	To be determined
Quest Engineering Services & Testing, Inc. 2737 NW 19th St., Pompano Beach, FL 33069 Ph: 954-582-9800 | Fax: 954-582-9836 sail@questengg.com	Geotechnical	To be determined

11. Litigation

Carollo has been involved in the following litigation in the past five (5) years related to the provision of professional services:

- In 2015, Carollo and a client were both the subject of a lawsuit filed by a homeowner related to dwindling water supplies and questioned water rights. Carollo was subsequently dismissed from the lawsuit, but that dismissal is now under appeal.
- In 2015, Carollo and others were the subject of a lawsuit filed by the spouse of deceased prison inmate alleging that contaminated water at the prison caused the inmate's death. Carollo was subsequently dismissed from the lawsuit.
- In 2015, Carollo, Carollo's client, and others were the subject of a lawsuit filed by an employee of the client who was injured while performing maintenance activities not related to Carollo's design improvements and/or Carollo services to the client. Carollo was subsequently dismissed from the lawsuit.
- In 2015, Carollo and a paint manufacturer were the subject of a lawsuit filed by a coatings subcontractor related to the subcontractor's failure to properly prepare the painting substrate and the resultant failure of the coating. The matter was submitted to mediation and thereafter settled with no admission of fault by Carollo.
- In 2016, Carollo and a client were both the subject of a civil lawsuit filed by the construction contractor on a water supply project related to the construction contractor's claim of changed subsurface conditions. Carollo was subsequently dismissed from the lawsuit.
- In 2017, Carollo was brought into a lawsuit between a client and the construction contractor claiming project delays related to the construction of a new wastewater treatment plant. Carollo denies responsibility for any of the claims. The lawsuit is in progress.
- In 2018, Carollo, the construction contractor, and the client were the subject of a lawsuit filed by property owners along a sewer interceptor realignment project where construction operations extended beyond the originally projected construction completion date. The matter was submitted to mediation and thereafter settled with no admission of fault by Carollo.
- In 2019, Carollo and several other large water engineering firms doing business in Florida were sued by a private citizen who has a history of suing governmental entities (i.e., his most recent lawsuit was against the Federal Reserve). The overall allegations of the citizen center around claims that Carollo was working with the other noted water firms to hide an alleged underground water source on the plaintiff's/citizen's property from our Florida clients. Carollo denies all the allegations. The lawsuit was dismissed, however the plaintiff has appealed the dismissal.

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
Acting Engineering Manager,
City of Oklahoma City, OK

12. City Forms

As requested in the RFQ, we placed the Project Team Form in *Section 3*. and the Local Business Forms in *Section 9*. The remaining forms are provided in this section.

DEVELOPING THE BEST SOLUTIONS

"I can always trust Carollo to make the right decisions for our projects. They focus on understanding our goals and objectives to ensure they develop the best solutions - not just a copy of some job off the shelf. Despite facing many difficult permitting, schedule and budget challenges, they always find a way to deliver and exceed our expectations. Their level of client service is second to none and I would highly recommend them for any project."

– Jay Simonton
CIP Project Manager, City of Yuma, AZ

COMPLETE THE PROPOSER INFORMATION FORM ON THE ATTACHMENTS TAB IN THE EBID SYSTEM. PROPOSERS ARE TO COMPLETE FORM IN ITS ENTIRITY AND INCLUDE THE FORM IN YOUR PROPOSAL THAT MUST BE UPLOADED TO THE RESPONSE ATTACHMENTS TAB FOR THE RFQ IN THE EBID SYSTEM.

PROPOSER INFORMATION PAGE

RFQ E-04-20 (number), Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System (RFQ name)

To: The City of Pompano Beach, Florida

The below named company hereby agrees to furnish the proposed services under the terms stated subject to all instructions, terms, conditions, specifications, addenda, legal advertisement, and conditions contained in the RFQ. I have read the RFQ and all attachments, including the specifications, and fully understand what is required. By submitting this proposal, I will accept a contract if approved by the City and such acceptance covers all terms, conditions, and specifications of this proposal.

Proposal submitted by:

Name (printed) Elizabeth Fujikawa Title Vice President

Company (Legal Registered) Carollo Engineers, Inc.

Federal Tax Identification Number 86-0899222

Address 2728 North University Drive, Bldg 2700

City/State/Zip Coral Springs, FL 33065

Telephone No. 954-837-0030 Fax No. 954-837-0035

Email Address efujikawa@carollo.com

TIER 1/TIER 2 COMPLIANCE FORM

IN ORDER FOR YOUR FIRM TO COMPLY WITH THE CITY'S LOCAL BUSINESS PROGRAM AS A TIER 1 OR TIER 2 VENDOR, BIDDERS MUST COMPLETE THE INFORMATION BELOW AND UPLOAD THE FORM TO THE RESPONSE ATTACHMENTS TAB IN THE EBID SYSTEM.

TIER 1 LOCAL VENDOR

_____ My firm has maintained a permanent place of business within the city limits and maintains a staffing level, within this local office, of at least 10 % who are residents of the City of Pompano Beach.

And/Or

_____ My firm has maintained a permanent place of business within the city limits and my submittal includes subcontracting commitments to Local Vendors Subcontractors for at least 10 % of the contract value.

Or

☑ My firm does not qualify as a Tier 1 Vendor.

TIER 2 LOCAL VENDOR

_____ My firm has maintained a permanent place of business within Broward County and maintains a staffing level, within this local office, of at least 15% who are residents of the City of Pompano Beach

And/Or

_____ My firm has maintained a permanent place of business within Broward County and my submittal includes subcontracting commitments to Local Vendors Subcontractors for at least 20% of the contract value.

Or

☑ My firm does not qualify as a Tier 2 Vendor.

I certify that the above information is true to the best of my knowledge.

February 13, 2020
(Date)

Carollo Engineers, Inc.
(Name of Firm)

BY: Elizabeth Fujikawa, PE, LEED AP, BCEE
(Name)

BIDDERS ARE TO COMPLETE FORM AND UPLOAD COMPLETED FORM TO THE EBID SYSTEM

EXHIBIT E

MINORITY BUSINESS ENTERPRISE PARTICIPATION

RFQ #E-04-20

List all members of your team that are a certified Minority Business Enterprise (as defined by the State of Florida.) You must include copies of the MBE certificates for each firm listed with your electronic submittal.

Name of Firm	Certificate Included?
Gamboa Engineers, LLC	Yes
Quest Engineering Services & Testing, Inc.	Yes

State of Florida

Minority Business Certification

Gamboa Engineers, LLC

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

06/06/2019 to 06/06/2021

Jonathan R. Satter, Secretary
Florida Department of Management Services

office of supplier DIVERSITY

Office of Supplier Diversity • 4050 Esplanade Way, Suite 380 • Tallahassee, FL 32399 • 850-487-0915 • www.dms.myflorida.com/osd

Exhibit A - Original Agreement

State of Florida

Minority Business Certification

Quest Engineering Sevices & Testing, Inc.

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

08/19/2019 to 08/19/2021

Jonathan R. Satter, Secretary
Florida Department of Management Services

Department of MANAGEMENT SERVICES
Office of Supplier Diversity

Office of Supplier Diversity
4050 Esplanade Way, Suite 380
Tallahassee, FL 32399
850-487-0915
www.dms.myflorida.com/osd

Exhibit A - Original Agreement

13. Appendix

As requested in the RFQ, we have included one of Mario Gamboa's previous Electrical Master Plans on the following pages.

MANATEE COUNTY UTILITIES

SOUTHWEST WATER RECLAMATION FACILITY ELECTRICAL MASTER PLAN

TECHNICAL MEMORANDUM MASTER PLAN FOR UPGRADES OF 5 kV AND 480V ELECTRICAL SYSTEM

FINAL
November 2014

401 NORTH CATTLEMEN ROAD, SUITE 306 • SARASOTA, FLORIDA 34232 • P. 941.371.9832 • F. 941.371.9873

MANATEE COUNTY UTILITIES

SOUTHWEST WATER RECLAMATION FACILITY ELECTRICAL MASTER PLAN

TECHNICAL MEMORANDUM

MASTER PLAN FOR UPGRADES OF 5 kV AND 480V ELECTRICAL SYSTEM

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Technical Memorandum

MASTER PLAN FOR UPGRADES OF 5 kV AND 480 VOLTS ELECTRICAL SYSTEM

1.0 EXECUTIVE SUMMARY

Manatee County (County) owns and operates the Southwest Water Reclamation Facility (SWWRF), which is an advanced wastewater treatment facility permitted to treat 15 million gallons per day (mgd) at an annual average day flow (AADF). The process of treating the wastewater to reuse standards and high service pumping for distribution requires substantial electrical energy. The facility's operation and reliability of its process depends on the proper functioning and safe configuration of the facility electrical power system.

The objective of this technical memorandum (TM) is to evaluate the condition and configuration of the existing SWWRF electrical system with an assessment from multiple perspectives, including:

- Equipment characteristics for safe operation and safe maintenance
- Analysis of the electrical system configuration and flexibility to isolate short circuit faults,
- Analysis of equipment age, long term reliability, remaining life, impacts of corrosive environment and recommendations for future replacement.
- Spare electrical capacity to supply power for anticipated future process loads

Additionally, the assessment includes options for reducing quantities of equipment by combining functions but maintaining reliability for power distribution and standby power generation, and development of alternatives for master planning the design and construction of future equipment replacement and upgrades.

1.1 Summary of Findings and Recommendations

The summary of recommendations and the included opinion of cost can be used as a basis for capital improvement projects (CIP) budget projections and scoping of work to design and construct the vital improvements in separate construction phases.

The assessment of the existing 5 kV switchgear, 5 kV generators, substation 5 kV switches, indoor 5 kV to 480 volt transformers, 480 volt switchboards and 480 volt motor control centers revealed that:

- Most of the existing equipment installed since 1988 is reaching the end of its useful duty cycle

- Numerous pieces of electrical equipment are obsolete due to progressive changes in electrical technology and/or lack of spare parts,
- The older electrical equipment is deteriorating because it is located in electrical rooms without air conditioning, with ventilation from humid environment, and some electrical rooms like in the headworks structure is exposed to a corrosive environment with hydrogen sulfide gas.
- The 5 kV in the main electrical room does not have enough room space for the layout of new larger switchgear, while 5 kV equipment shall be continuously energized for keeping the plant in operation. Therefore, it will be necessary to increase the size of the electrical room.
- The quantity of 5kV/480 V substation transformer have increased to a total quantity of 20 units over 25 years, because the original design did not include spare capacity in transformers and 480 volts swtichboards, for supplying power to additional process loads. The maintenance of such large quantities of substation transformers represents substantial operating cost and requires significant capital for asset replacement.

Most of the electrical equipment that is over 25 years old should be replaced within 5 to 10 years (between 2014 through 2024), for assurance to maintain a reliable and safe power distribution system. The recommendations for an upgrade of the power distribution system, from a master planning perspective, are summarized in Table 1 and accounting of each opinion of cost is further itemized in Section 6.0.

Table 1 Summary of Electrical Improvements and Related Construction Cost Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities

No	Description	Recommended Year	Total
1	Add Air Conditioning for Key Main Electrical Rooms (total of 3)	2016	$204,000
2	Intercept 5 kV Feeders at Headworks for Anoxic Basin's Transformers	2016	$221,000
3	Add Separate 5 kV Feeders for the Northeast Blower's Building	2016	$377,000
4	Remove Substations No. 5 and. 6 and Replace MCCs B1-B4	2019	$522,000
5	Replace Substations No. 7 and 8 and MCCs DW1, DW2, D1 and D2	2019	$785,000
6	Remove Substations No. 1and 2 and Replace MCCs E1 – E2	2019	$548,000
7	Remove Substations No. 9 and 10	2019	$61,000
8	Replace 480 Volts Switchgear No. 11 and 12	2019	$906,000

Table 1	Summary of Electrical Improvements and Related Construction Cost Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities		
No	**Description**	**Recommended Year**	**Total**
9	Construct new Vault for FPL Utility Transformers	2019	$ 300,000
10	Replace 5 kV Main Switchgear including Wiring	2019	$3,013,000
11	Replace Generator's 5 kV Breakers and Controls	2019	$813,000
12	Allowance for Replacement of Misc. Panels for Outlets, Lighting and Instruments	2024	$200,000
13	Replacement of Standby 2,000 kW Generator No. 2	2022	$1,300,000
	OPINION OF TOTAL PROBABLE CONSTRUCTION COST		**$9,250,000**

2.0 BACKGROUND

Manatee County (County) owns and operates the Southwest Water Reclamation Facility (SWWRF), which is located in southwest Manatee County directly east of 66th Street West in Bradenton, FL. It is the oldest of the County's three water reclamation facilities within a predominately built-out area of the County. The SWWRF is an advanced wastewater treatment facility permitted to treat 15 million gallons per day (mgd) at an annual average day flow (AADF). In 2013, the facility treated approximately 13 mgd AADF of wastewater. The process of treating the wastewater to reuse standards and high service pumping for distribution requires substantial electrical energy with an average demand range of 125 to 200 kilowatts (KW) or kilovolt-amperes (kVA) per mgd. The facility's operation and reliability of its process depends on the proper functioning and safe configuration of the facility electrical power system.

The SWWRF purchases electric power service from Florida Power and Light (FPL) at 4,160 volts (V) by way of three (3) 1,500 kVA service transformers, which are located within a utility vault room. The voltage is stepped down from 23 kilovolts (kV) to 4,160 V, and is supplied to the plant main switchgear located in the main electrical room (adjacent to the FPL vault room).

The 4,160 V main switchgear contains two (2) input circuit breakers for redundant reliability of FPL power and has an intermediate tie circuit breaker that facilitates splitting the switchgear's electrical equipment in two separate parallel sections for the input/output of power. Also, the main switchgear contains the feeder circuit breakers that distribute 4,160 V power throughout the SWWRF, to remote substations-transformers that step down the voltage from 4,160 V to 480 V switchboards, which supply power to downstream 480 V motor control centers (MCC) and the MCCs supply power to mechanical process equipment. Also, the SWWRF has two (2) diesel fuel engine driven generators for standby power with a combined power generation capacity of 4,000 kW. These are interconnected to the main 4,160 V switchgear for the supply of continuous power to the process equipment, during and unexpected failure of the normal FPL utility power.

The configuration of the power distribution system for the SWWRF was established during the last major upgrade and expansion of the facility in 1988. Numerous additions to the power distribution system have been constructed since then following the basic configuration. At this time, evaluations and master planning for upgrades and replacement of equipment must be based around the basic configuration, with additional improvements for safer operation and maintenance, higher energy efficiency for power distribution and state of the art technology for protection of capital investment and collection of data for monitoring of electric power consumption.

2.1 Objective

The objective of this technical memorandum (TM) is to evaluate the condition and configuration of the existing SWWRF electrical system as of the year 2014 with an assessment from multiple perspectives, including:

- Equipment characteristics for safe operation and safe maintenance without impacting the SWWRF process.
- Analysis of existing electrical system configuration and flexibility to isolate short circuit faults, while critical water process equipment remains in operation.
- Analysis of long term reliability, equipment age, its remaining life and availability of spare parts from the equipment manufacturer
- Evaluate equipment condition in corrosive wastewater environment facility and humid weather in Florida that accelerates the deterioration and shortens life of metallic electrical equipment and components
- Assess electrical equipment spare capacity to supply power for anticipated future process loads according with the plant treatment capacity in millions of gallons per day (MGD) and anticipated future plant growth.

Additionally, the assessment includes options for reducing quantities of substations equipment by combining equipment function while maintaining reliability for power distribution and standby power generation, and development of alternatives for master planning the design and construction of future upgrades. The configurations for new equipment must follow the EPA guidelines for Class 1 Reliability, the 2014 requirements from applicable electrical codes, and recognized guidelines standards like NFPA-70E Standard for Electrical Safety in the Workplace.

2.2 Power Capacity of the Main Electrical Switchgear and Generators

The overall power capacity of the existing main switchgear is up to 8,636 kilovoltamperes (kVA) at 4,160 volts; however, the capacity of the system is limited by the combined supply of the FPL’s 4,500 kVA electric service.

Calculations for the electrical load revealed there is an approximate connected, on duty load of 5,000 horse power (HP), which could be approximated to 5,000 kVA. The electrical load takes into account the connected equipment load as of 2014, including the anticipated designed loads from the SWWRF Nitrogen Removal project. These calculations do not include the accounting of connected load from standby equipment that exists only for process reliability. Based on educated statistical records and experience for power demand in wastewater treatment plants and judicious engineering experience and analysis of the SWWRF electrical characteristics, a power demand diversity factor of 75% might be applied to estimate the approximate power demand of: 5000 kVA x 0.75 = 3,800 kVA. The upper limit of this calculated power demand usually exceeds the actual power demand readings from electronic power meters or FPL utility meters.

Based on engineering judgment and above calculations, the existing main switchgear at 4,160 V and with 1,200 amperes bus has a power supply capacity of 8636 kVA and includes spare capacity of 227% above the calculated electrical demand load, which means the existing 5 kV switchgear capacity has been adequate for the application. However, the switchgear was not planned with spare breakers for load growth and the electrical room does not floor space for adding switchgear sections with breakers.

Also, the existing two diesel fuel engine-generators for standby power are rated for 2,000 KW or 2,500 kVA each, with a combined power generating capacity of 4,000 kW or 5,000 kVA. According to records of the SWWRF operating staff, the average running load of the facility is normally supplied with one generator, which means the average power demand is less than 2,000 kW and the combined power generating capacity of both standby generators is also adequate for their application.

2.3 Objective Criteria for Upgrades of Electrical System

The approach and criteria for design and construction of upgrading a power distribution system in a water reclamation facility should be based upon multiple guidelines and requirements , such as safety for operating and maintenance personnel, environmental responsibility required by EPA, requirements of pertinent building and electrical codes, configuration of the power distribution to process equipment in separate, parallel, or redundant power sources, to assure reliability and continuous treatment process, and convenience during maintenance. Also, flexibility and space for future additions to the SWWRF has been considered from a process perspective, and accommodated by this master plan by providing spare capacity allowance for load growth within the electrical power system.

The replacement or upgrades of electrical equipment in electrical rooms shall include layouts and arrangement for partial shutdown of power distribution, that simplify maintenance or repairs with de-energized apparatus for worker’s safety and convenience for future replacement within the room space, while critical treatment process is energized for continuous plant operation.

Additional criteria for design and construction has been identified and listed in Section 7.0 of this memorandum.

3.0 ASSESSMENT OF 5 kV SWITCHGEAR AND 480 VOLT ELECTRICAL SYSTEM

3.1 Background of Basic Power System and Subsequent Additions

Carollo Engineers performed a Repair and Replacement (R&R) assessment of the facilities assets, which included the original power distribution system. The assessment also included a review of record drawings for the 1988 project that made significant additions to the electrical power distribution system, and subsequent major improvements and electrical additions until 2014. The following is a summary of the major electrical system projects completed and/or in construction since the 1988 expansion:

- In 1992, a methane gas, co-generator system was installed to utilize methane gas generated by the anaerobic sludge digestion system and 5 kV circuit breakers were added to the main switchgear for interconnection of the co-generation system. However, the anaerobic digesters have not been operated because of aging equipment and low gas production. The County decided not to invest further capital dollars to upgrade the system, and the anaerobic digesters have been converted to aerated sludge holding tanks. Because of the methane gas is no longer available, the co-generator has been disconnected.

- In 1998, additional blowers were installed at the northeast part of the facility, for process air supply to the aeration basins. The power distribution equipment consisted of 5 kV motor control centers and 5 kV electric motors.

- In 2008, additional pumps were installed to distribute reuse water to the County's Master Reuse System and the project added two (2) 5 kV switches and two (2) substation 750 kVA transformers No. 11 and No. 12 (at the maintenance building), to power the pump's speed controllers (VFDs).

- In 2012, design was completed for a new high service pump station to distribute reuse water to the County's Master Reuse System. The project is currently under construction and will add two (2) 5 kV switches at 5 kV switchgear No. 11 and No. 12, for supplying power to two (2) 2000 kVA substations Nos. 13 and 14.

- In early 2013, design was completed on a project to convert the existing anaerobic digesters to aerobic sludge holding tanks. This project is currently under construction and will add two (2) 500 kVA transformers to step down the voltage from 5 kV to 480 V, and provide new MCCs for power to the sludge holding tank blowers and sludge holding tank mixers and related pumps.

- In 2013, design was completed on a project to convert the existing activated sludge treatment process to the Modified Lutzack-Eddinger process for nitrogen removal. This project is currently in the bidding process and construction is expected to start in middle to late 2014. The project will add two (2) 500 kVA transformers and 480 V MCC for power to the anoxic basins (converted primary clarifiers) and it will add two (2) 1,000 kVA transformers. A new 480 V MCC will be installed for supplying power to two new 300 HP aeration blowers.

All of the above listed designs added (or will add) ten (10) 5 kV/480 V substation transformers to the existing power distribution system, but the basic main 5 kV switchgear configuration has been kept intact in the main electrical room.

The connection of the above listed 10 additional substation transformers have been tapped together with existing substations to the output of existing feeder circuit breakers on the main 5 kV switchgear; as a result the malfunction of one 5 kV feeder circuit breaker could impact or shutdown power to multiple substations and process loads.

The review of documentation for the Repair and Replacement (R&R) assessment of the facilities reveals that the above designs were done without the guidelines of formal County criteria for electrical design or without an electrical master plan to guide improvements.

3.2 Overall Assessment of Electrical Equipment

Carollo Engineers made physical inspections of the configuration of the 5 kV power distribution, 5 kV standby power generators, 5 kV MCCs, and indoor 5 kV/480 V transformers, and observed equipment that has corrosive impacts due to humidity and examined related 480 V switchgear that is near the end of its useful life.

During the assessment of the existing electrical circuit breakers in switchboards, it was noticed that circuit breakers that supply power to MCCs do not comply with article 240.87 of the NFPA-70, National Electrical Code (NEC) and the Florida Building Code, which requires the subject feeder circuit breakers to include an electronic means for instantaneous tripping or “energy-reducing maintenance switching with local status indicator, that would allow a worker to set a circuit breaker trip unit to “no intentional delay.” Therefore, the circuit breakers on future new 480 V switchboards with high magnitude of inlet energy that supply power to MCCs should include adjustable electronic trip settings with manual selector switches. This will reduce the let through energy and minimize the category of arc flash on the MCCs, for the convenience of personnel to decrease arc flash risk and less quantity of protective equipment.

Table 2 includes a summary of the equipment assessment.

Table 2 Assessment of Power Distribution Equipment and Generation System Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities					
Equipment	**Service**	**Physical Condition(2)**	**Code Violation Identified**	**Located in Flood Area(1)**	**Action Recommended**
Main 5 kV Switchgear	5 kV Main Service	Fair, old	No No Arc Flash Labels	No	Replace entire switchgear and add circuit breakers for feeders to substation transformers. New switchgear layout should be in larger electrical room to facilitate future replacement Consider separate cabinets for low voltage controls of circuit breakers Add air conditioning for the electrical room
5 kV Generator Switchgear	Controls for two 5 kV Generators	Fair; Remaining half of average life.	No No Arc Flash Labels	No	Replace entire generator's switchgear and install in same room with other 5 kV switchgear. Provide separate low voltage controls in separate cabinet. Add air conditioning for the electrical room
Gen 1 - 2,000 kW	5 kV Standby Power	Good	No	No	Keep existing

Table 2 Assessment of Power Distribution Equipment and Generation System
Southwest Water Reclamation Facility Electrical Master Plan
Manatee County Utilities

Equipment	Service	Physical Condition(2)	Code Violation Identified	Located in Flood Area(1)	Action Recommended
Gen 2 – 1,825 kW	5 kV Standby Power	Good	No	No	25 years on duty. Low running hours. Future replacement may be required due to Federal Regulations for engine exhaust emissions
Substation No. 1 & No.2	Supplies power to MCC-E1; MCC-E-2; and power to miscellaneous equipment in maintenance building and Operations Control Building	Fair/ old	Not to current codes for arc flash protection	No	Remove equipment from generator room and Replace function with other combined substations (like No. 11 and No. 12) and locate transformers. outdoor on concrete pad.
MCC E-1 & MCC-E-2	Supplies power to secondary clarifiers 2,3, 5 and miscellaneous equipment in maintenance building and Operations Control Building	Fair/ old	Not to current codes for arc flash protection	No	Remove equipment and Replace function with MCCs located in 480V conditioned space
Substation No. 3 & No.4	Supplies power to headworks equipment and secondary clarifiers 3 and 4	Obsolete	Not to current codes for arc flash protection	No	Remove equipment and replace function with other combined substations (like No. 5 and No. 6) and locate transformers outdoor on concrete pad.

Table 2 Assessment of Power Distribution Equipment and Generation System
Southwest Water Reclamation Facility Electrical Master Plan
Manatee County Utilities

Equipment	Service	Physical Condition[2]	Code Violation Identified	Located in Flood Area[1]	Action Recommended
480 V MCC- HW-1 and HW-2	Supplies power to headworks equipment and secondary clarifiers 3 and 4	Obsolete	Not to current codes	No	Remove equipment and replace function with equipment located in available conditioned space of MCC in electrical room for anoxic basins
Substation No. 5 & No.6	Supplies power to previous aeration and daft equipment	Obsolete	Not to current codes for arc flash protection	No	Remove equipment and replace function combined with newer outdoor transformers that will be part of the SWWRF Nitrogen Removal project.
480 V MCCs B-1 through B-4 and MCC-1	Supplies power to previous aeration and daft equipment	Fair/ old	Not to current codes	No	Remove equipment and replace function with only two MCCs of larger capacity, to be located in conditioned space
Two 5 kV Motor Control Centers for Aerations Blowers	5 kV Power to Aeration Blowers	Good, Reliable	No Arc Flash Labels	No	Keep 5 kV equipment until end of its useful life. Disconnect existing interconnection with 5 kV feeders for substations Nos. 2, 3, 5, and 6. Add separate source of 5 kV power from the main 5 kV switchgear Add Arc Flash labels

Table 2 Assessment of Power Distribution Equipment and Generation System
Southwest Water Reclamation Facility Electrical Master Plan
Manatee County Utilities

Equipment	Service	Physical Condition[2]	Code Violation Identified	Located in Flood Area[1]	Action Recommended
Substation No. 7 & No.8	Supplies power to digesters and dewatering process equipment	Obsolete	Not to current codes for arc flash protection	No	Remove equipment and Replace function combined with outdoor transformers that are part of the 2013 Digester Modifications Project
480 V MCCs D1; D-2 and DW-1; DW-2	Supplies power to previous digesters related pumps and dewatering process equipment	Obsolete/old	Not to current codes for arc flash protection	No	Replace equipment with two MCCs, to be located in conditioned space
Substation No. 9 & No.10	Supplies power to deep well 350 hp pumps	Fair/Old	Not to current codes for arc flash protection	No	Replace equipment using outdoor pad mounted transformers
480 V Switchboards No. 9 and No. 10	Supplies power to deep well 350 hp pumps	Fair/old	Not to current codes for arc flash protection	No	Remove equipment. Consider combined function with two new switchboards No. 11 and No. 12, to be located in conditioned space
Substation No. 11 & No.12	Supplies power to deep well 350 hp pumps	Good	No arc flash labels	No	Keep 5 kV/480 V transformer equipment and add air conditioned to room space

Table 2 Assessment of Power Distribution Equipment and Generation System
Southwest Water Reclamation Facility Electrical Master Plan
Manatee County Utilities

Equipment	Service	Physical Condition(2)	Code Violation Identified	Located in Flood Area(1)	Action Recommended
480 V Switchboards No. 11 and No. 12	Supplies power to deep well 350 hp pumps	Good	Not to current codes for arc flash protection	No	Consider combined function with two new switchboards No. 11 and No. 12, to be located in conditioned space
5 kV Transformers No. 13 & No.14	Supplies power to 480 V switchgear that feed 350 hp VFDs for water reuse pumps	New	None	No	Interconnect with separate 5 kV feeders from main 5 kV switchgear and remove feeders from substation No. 11 and No. 12.
480 V Switchboard No. 13 & No.14	Supplies power to VFDs and high service 350 hp pumps for water reuse	New	None	No	None

Notes:
(1) Determinations of condition made by visual observation
(2) Additional specific assessment of each key electrical apparatus has been included with pertinent issues and recommendations and they are shown on figures with photographs in Appendix A.

3.3 Observations of Existing Electrical System and Equipment Location

The major components of the 5 kV and 480 V electrical systems are located at the center of the SWWRF site, where there is no significant electrical loads and small substation-transformers are situated throughout the facility, as shown in Figures 1, 2 and 3 (Electrical Partial Site Plan I, Electrical Partial Site Plan II, and Electrical Partial Site Plan III).

The existing 5 kV electrical equipment interconnection for power distribution is arranged as shown on the existing electrical one-line diagram in Figure 4. This figure shows the main 5 kV switchgear with two input power sources from the utility FPL and a third power source from the standby power generators is connected to one half-section of the 5 kV switchgear. Each main 5 kV switchgear section supplies power to downstream transformers and switchboards that supply power to numerous MCCs. The multiple water process equipment on duty and its redundant equipment like pumps, aeration blowers, and miscellaneous loads are distributed between different MCCs, for maintaining continuous treatment process while partial electrical equipment might be shutdown for repairs.

The assessment of the original electrical system configuration reveals that main 5 KV switchgear and small 5 kV transformers capacity were not planned with respective spare 5 kV breakers and spare transformer capacity for plant growth or changes. As a result, previous projects added a substantial quantity of other small substation-transformers and the practicality of such small equipment may be questionable from an operation and maintenance perspective.

3.4 Evaluation of Main 5 kV Switchgear Configuration

The existing electrical one-line diagram on Figure 4 shows that output power from the cabinet with generator's 5 kV breaker is routed via an overhead electrical busway, which interconnects to only one end of the main 5 kV switchgear. Detailed analysis of this configuration revealed a possible single point of failure, If the 5 kV half section of the main switchgear, where the generator interconnects would require momentary maintenance, then the facility reliability would substantially decrease since there is no readily available means to quickly interconnect the generator power to the other half of the switchgear during an FPL utility failure event. This switchgear configuration with possible single point of failure should be improved upon replacement of the entire 5 kV switchgear.

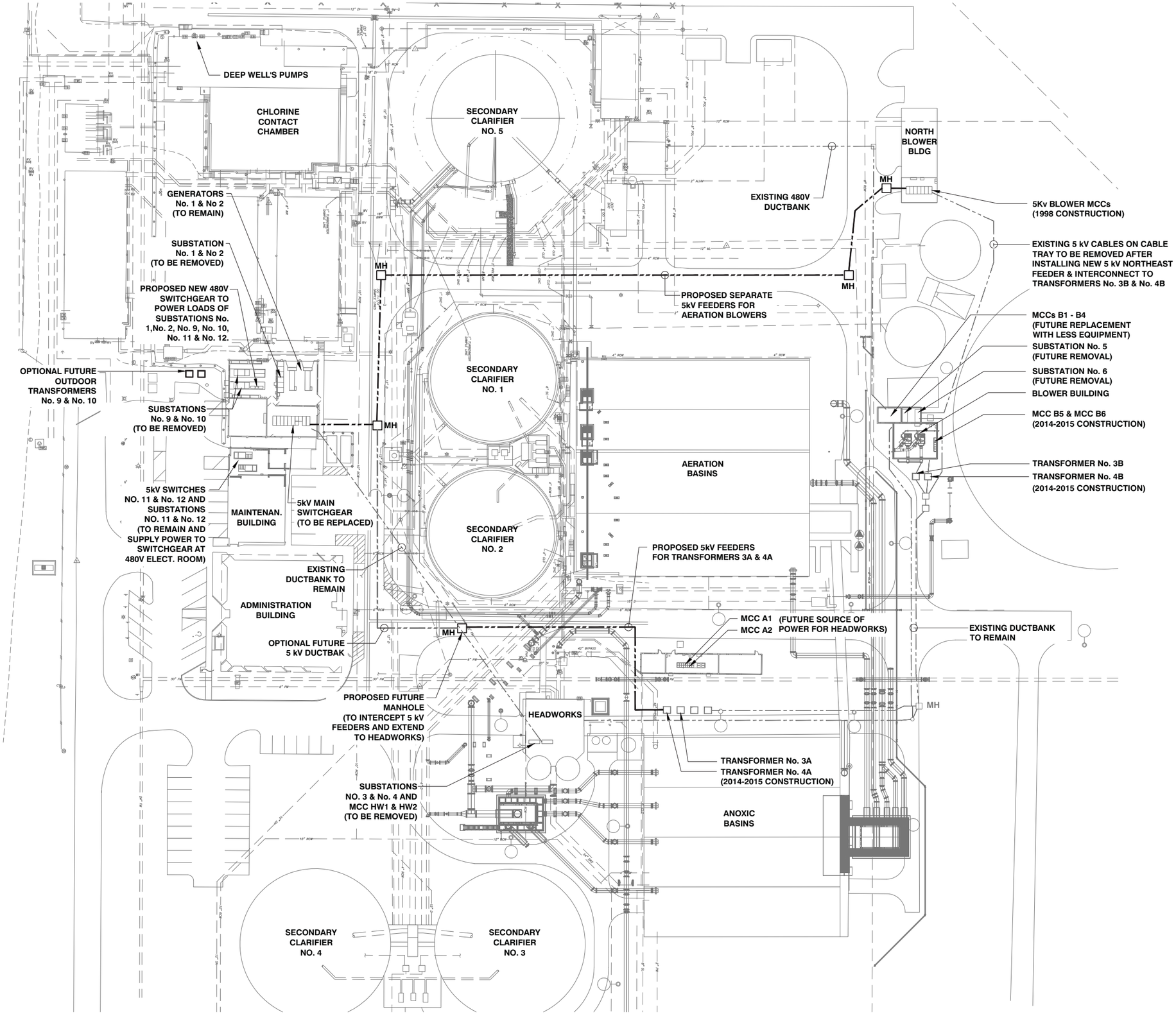

FIGURE No. 1
ELECTRICAL PARTIAL SITE PLAN I

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN

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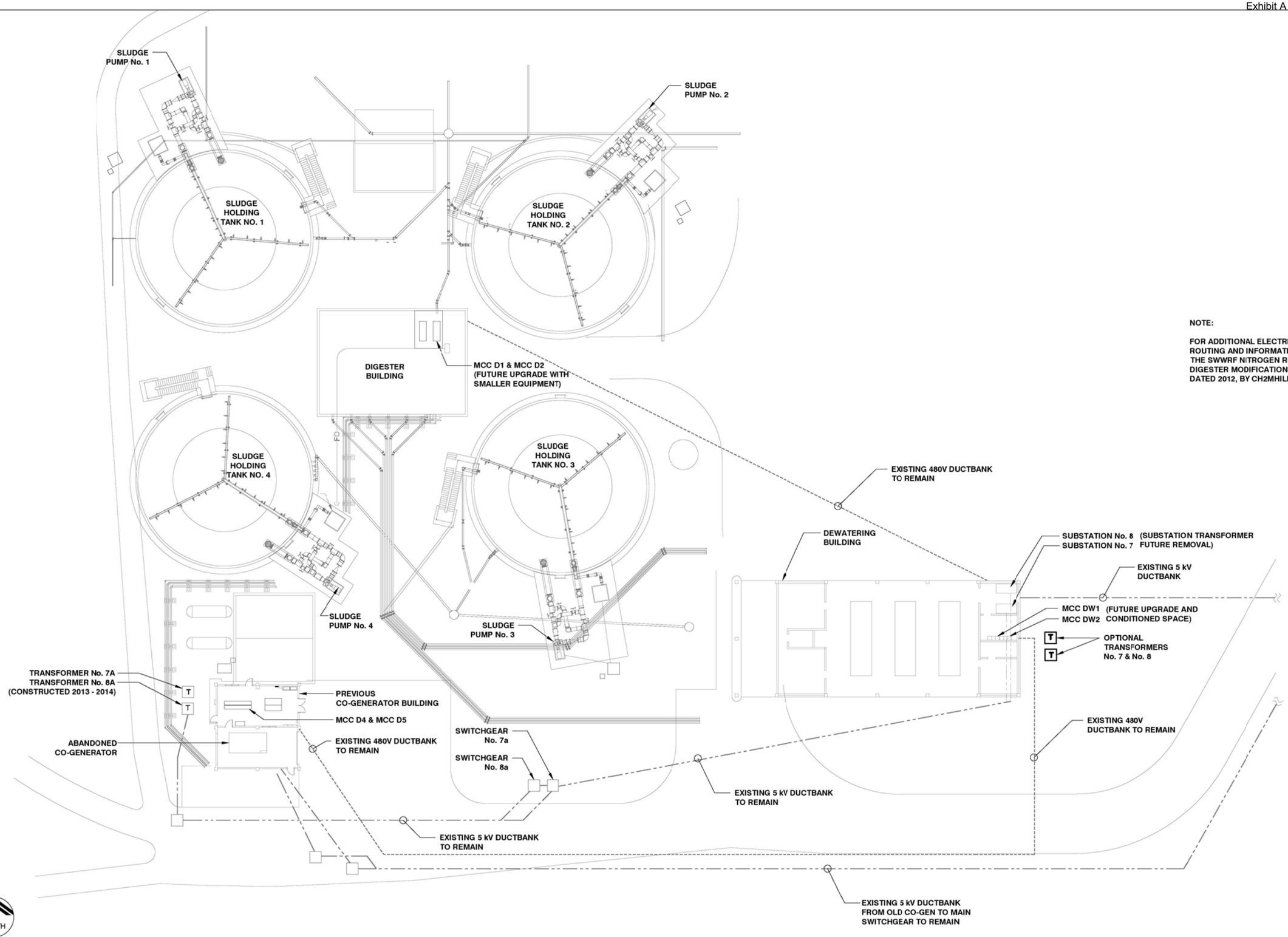

NOTE:

FOR ADDITIONAL ELECTRICAL DUCT BANK ROUTING AND INFORMATION, REFER TO THE SWWRF NITROGEN REMOVAL AND DIGESTER MODIFICATIONS DRAWINGS, DATED 2012, BY CH2MHILL

FIGURE No. 2
ELECTRICAL SITE PLAN 2 OF 3

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN IMPROVEMENTS

carollo

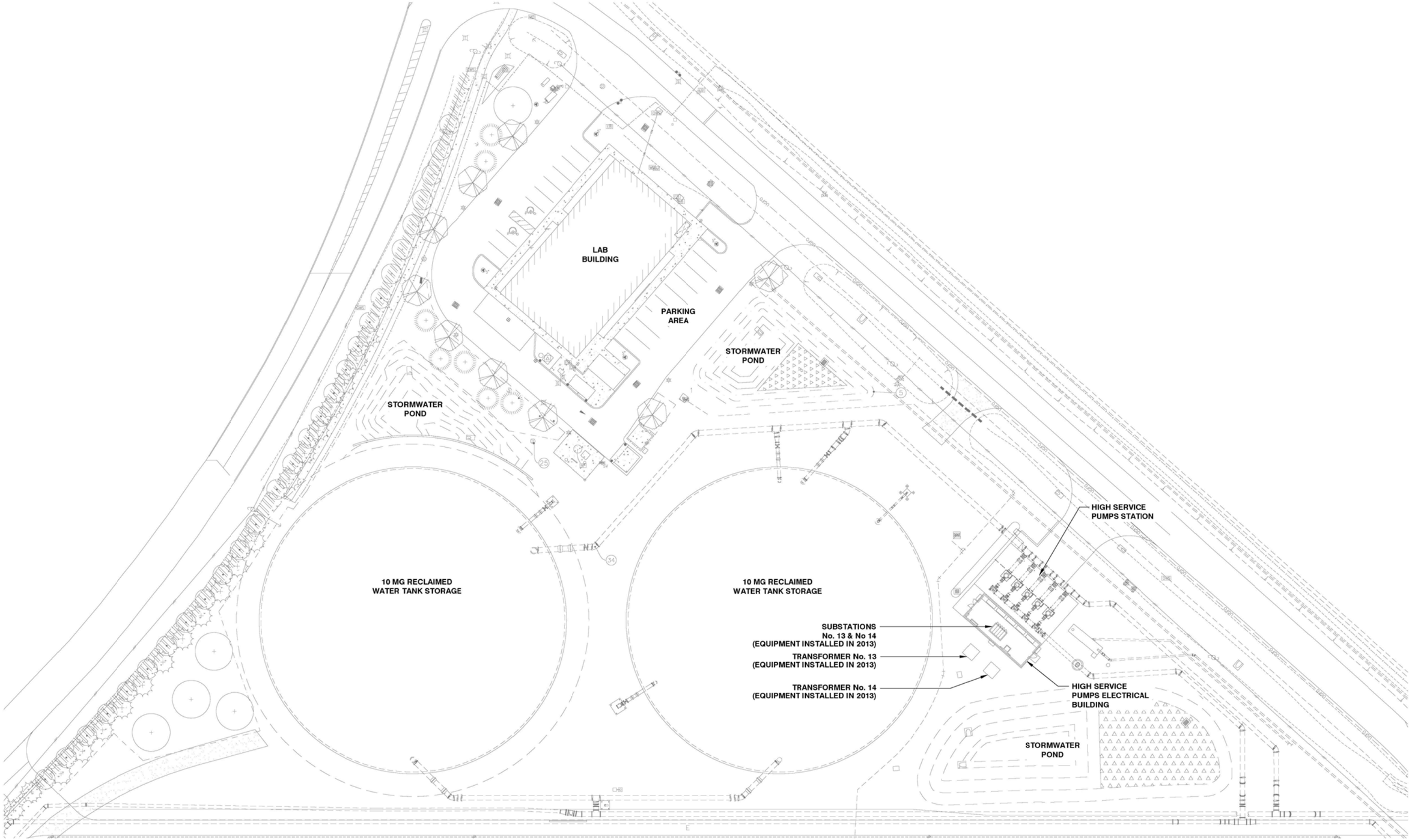

FIGURE No. 3
ELECTRICAL SITE PLAN 3 OF 3

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN IMPROVEMENTS

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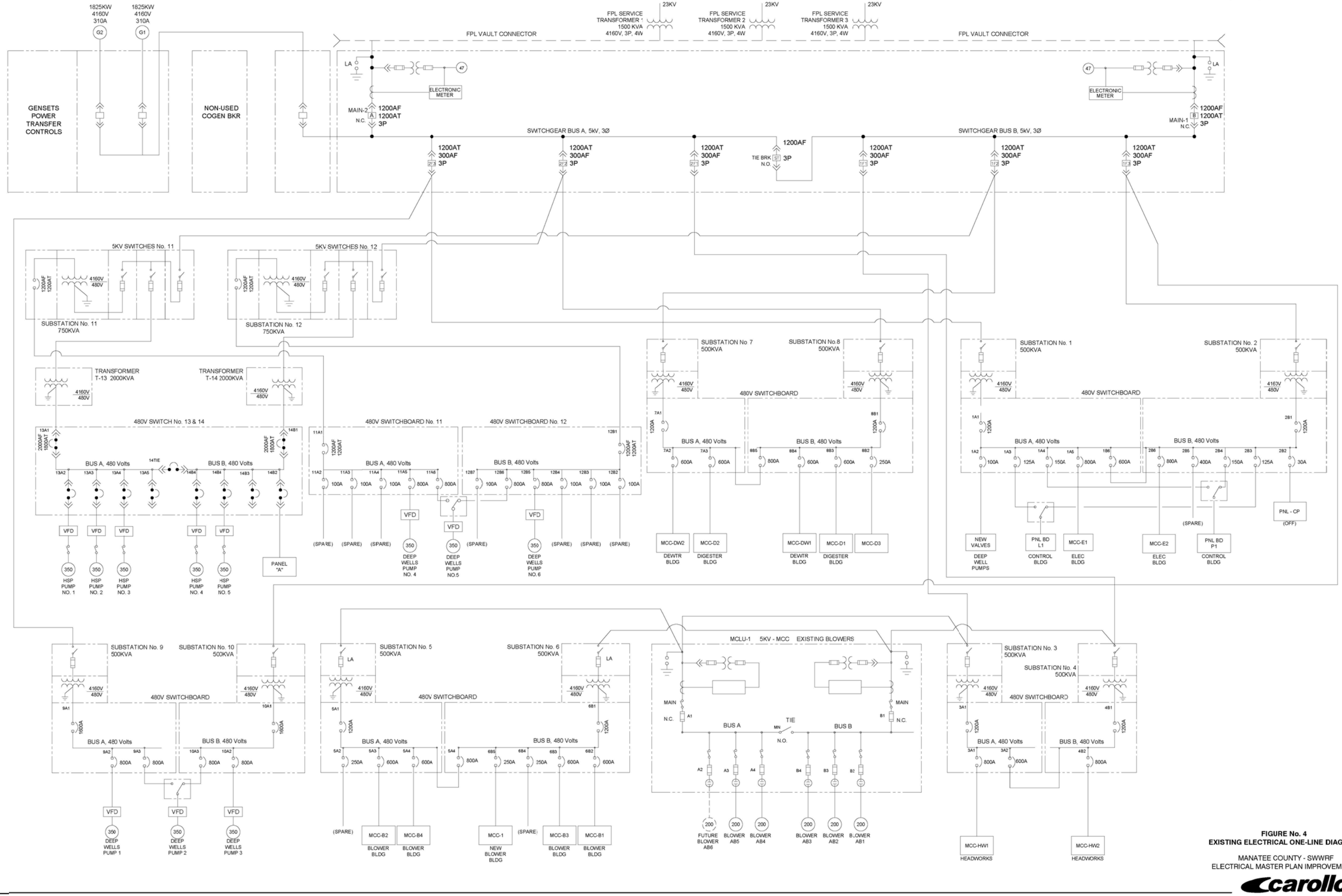

FIGURE No. 4
EXISTING ELECTRICAL ONE-LINE DIAGRAM

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN IMPROVEMENTS

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3.5 Evaluation of Generator's Interconnection and Main 5 kV Switchgear.

The one line diagram on Figure 4 shows that the output from the generator's 5 kV control panels or switchgear does not include a circuit breaker for the protection of the overhead electrical busway that interconnects to the main 5 kV switchgear. This configuration may be a potential condition for single point of failure and it shall be improved upon replacement of the entire 5 kV switchgear.

3.6 Assessment of Non-Necessary Electrical Substation-Transformers

The existing electrical one-line diagram on Figure 4 shows that the existing power distribution configuration includes most of the aeration system blowers operating at 4,160 V and two substation transformers Nos. 13 and 14 supply power to the high service pumps for water re-use that replaced the previous deep well pumps. These two processes (aeration and effluent pumps) represent most of the SWWRF significant electrical loads perhaps as much as 60 percent (%) of the facility energy demand and their load's are independent of other transformers in the plant.

However, otherpower distribution equipment contains 18 substation transformers, (No. 1, 2, 3, 3A, 4, 4A, 5, %A, 6, 6A, 7, 7A, 8, 8A,9, 10; 11 and 12) for stepping down the voltage from 4,160 to 480 V in a process area with approximately 40% of electrical loads, such as the headworks, the secondary clarifiers, the administration building lighting and control panels, air conditioning loads in the main 5 kV switchgear electrical room and the maintenance building electrical room, and the VFDs for speed control of effluent transfer pumps. A new design should consider deleting eight (8) substation transformers and combine their function with less transformers as shown in Figure 5. The benefit of fewer transformers would represent less capital cost for equipment replacement, less energy losses of non-loaded substation-transformers and less operating energy costs.

The proposed electrical one-line diagram shown in Figure 5 includes fewer 5 kV to 480 V transformers for the above-mentioned areas.

3.7 Assessment of Incident Energy and Risks of Arc Flash Hazards

Concurrent with this master plan assessment under a separate assignment, Carollo has performed additional engineering studies to determine the possible magnitude and category of arc flash energy on the 480 V switchboards. The study results show that the feeder's molded case circuit breakers with fixed tripping characteristics might not meet the code requirements of the 2011 NEC –240-87, which requires breaker's features for instantaneous tripping during maintenance for devices that supply power to the remote MCCs. Therefore, some existing MCCs have an available high magnitude of incident energy during short circuits events and their category of arc flash may require that personnel wear sophisticated personal protective equipment (PPE) during maintenance or repairs.

GENERAL NOTES:

1. ELECTRICAL EQUIPMENT TO BE LOCATED IN AIR CONDITIONED SPACE.
2. PROPOSED SCHEME DECREASES QUANTITY OF 5KV/480V SUBSTATION TRANSFORMERS FROM 20 TO 8 (OR 10).
3. CAPACITY OF TRANSFORMERS AND SWITCHBOARDS TO BE INCREASED IF NECESSARY AT DESIGN PHASE.

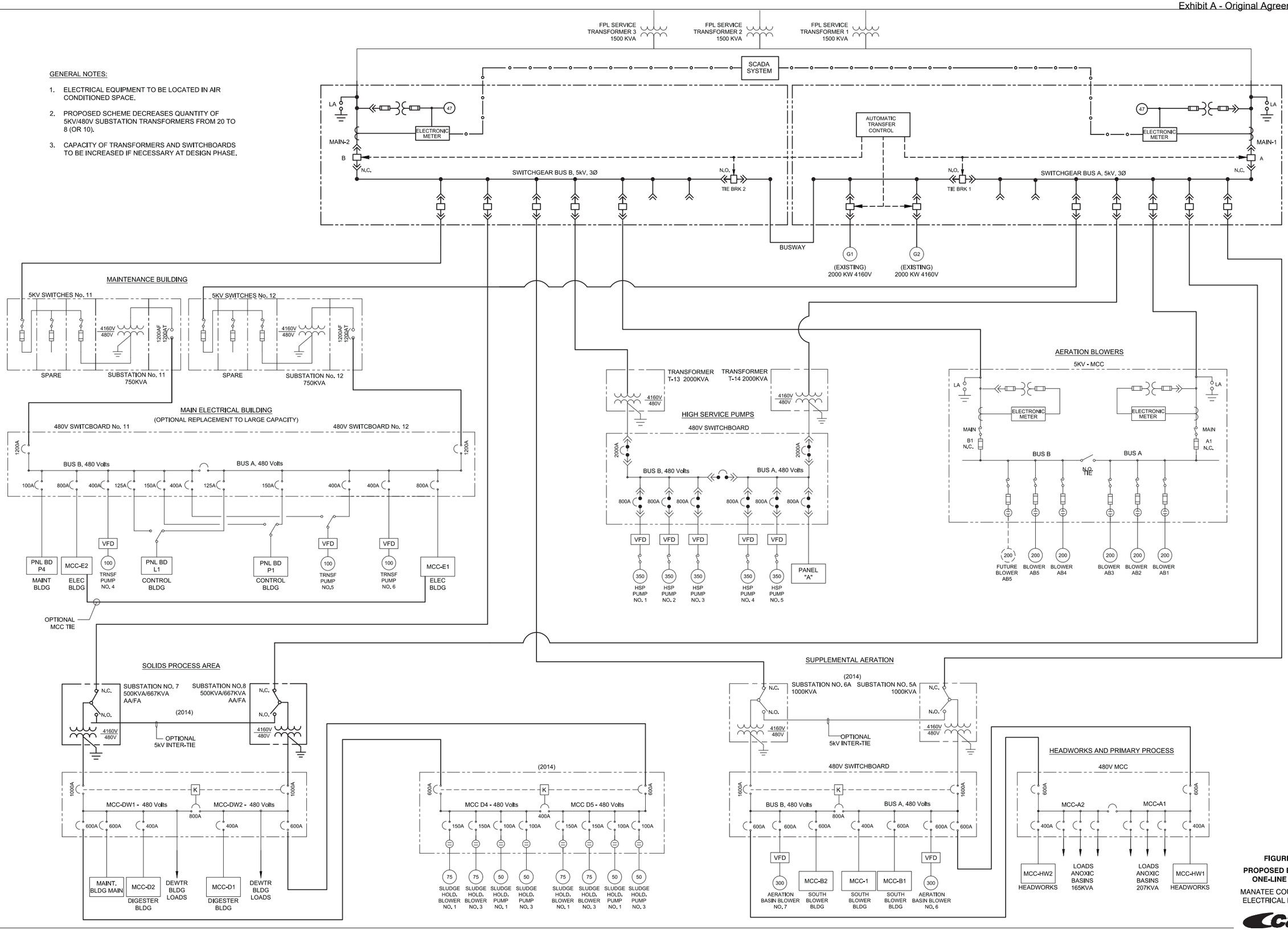


FIGURE No. 5
PROPOSED ELECTRICAL ONE-LINE DIAGRAM
MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN

carollo

4.0 SHORT TERM IMPROVEMENTS OF 5 kV AND 480 V SYSTEM

4.1 Add Air Conditioning to Main Electrical Room for 5 kV/480 V Switchgear

The deteriorating and progressive corrosion of existing 5 kV switchgear and 480 V MCCs is due to humid Florida weather and the corrosive environment at the water reclamation facility. The remaining useful life of electrical equipment could be stop from further deterioration if air conditioning is installed in electrical rooms as soon as possible. In addition to the air conditioning equipment, the electrical rooms will require internal improvements for closing ventilation louvers, replacement of doors, new insulation for walls and ceilings and ideally redundant energy efficient air conditioning equipment.

The schedule for the subject improvements should be within two (2) years or by 2016. The opinion of probable construction cost is shown with the summary of findings and recommendations on section 6.0, paragraph 6.1.

4.2 Reconfigure Underground 5 kV Feeders to Headworks and Anoxic Basins

The existing indoor 5 kV substation transformers Nos. 3 and 4 and related MCCs contain very small electrical loads and their large electrical load capacity is not justifiable for the connected loads at the headworks. The source of electric power for the headworks equipment and the secondary clarifiers No. 3 and No. 4 can be obtained from the new 480 V electrical equipment that will be constructed as part of the SWWRF Nitrogen Removal project.

The schedule for the subject improvements should be as soon as a new headworks structure is constructed, perhaps within 4 years or prior to 2018. The opinion of probable construction cost is shown with the summary of findings and recommendations on section 6.0, paragraph 6.2.

4.3 Reconfigure Underground 5 kV Feeders for Aeration System

Existing 5 kV underground feeders that supply power from the main electrical room towards the south and east part of the facility carry a substantial portion of the electrical loads, including headworks, primary clarifiers, and aeration system. Also, the design of the Nitrogen Removal System will be adding to the same 5 kV feeders 4 more outdoor (substation) transformers for the anoxic basins and two aeration blowers. A failure of these 5 kV feeders could cause a major operational impact and possible failure of the primary and secondary treatment processes.

The addition of another set of 5 kV underground feeders is recommended for separation of aeration loads from other loads. The proposed 5 kV feeders would be routed towards the northeast part of the plant via additional underground electrical ductbanks and manholes.

The schedule for the subject improvements should be as soon as possible or within 4 to 5 years or sooner. The opinion of probable construction cost is shown with the summary of findings and recommendations on section 6.0, paragraph 6.3.

5.0 PROPOSED RECONFIGURATION OF ELECTRICAL SYSTEM

5.1 Proposed Configuration of the 5 kV Power Distribution System

A new configuration of the main 5 kV switchgear is recommended and it should include two (2) tie breakers, plus the connection with the standby generator's breakers should be on a third electrical bus section located between the tie breakers. Each section of the proposed 5 kV switchgear for power distribution should include circuit breakers dedicated for protection of each remote major substation transformer, as necessary to improve reliability and avoid the existing condition that multiple transformers receive power from a single 5 kV circuit breaker.

The operating low voltage controls of the 5 kV switchgear should be located if possible in separate cabinets, away front the boundary of high voltage hazard, for minimizing the risk of exposure to possible arc flash hazards.

The protective relays associated with each 5 kV circuit breakers shall be electronic type, with state of the art features that facilitate diagnostics for troubleshooting and communication with a power quality monitoring system.

The proposed 5 kV switchgear configuration and the scheme for power distribution are shown in the power line diagram in Figure 5.

5.2 Improvement in Existing Main 5 kV Switchgear Room

The necessary footprint space for the new 5 kV switchgear will required more room space than existing due to the following reasons:

- The existing switchgear was not originally laid out with a configuration that facilitates equipment replacement, by removing portions of the switchgear while keeping the existing process equipment in continuous operation.
- The existing switchgear must be maintained energized, while new switchgear is installed and the load cable feeders become relocated from the old to the new switchgear.
- The main electrical room shall have space for the layout of the new 5 kV generator's breakers located adjacent to the main 5 kV switchgear.
- The electrical room shall have ample space for required working clearance in front and in back of the 5 kV switchgear, as well driveway clearances for maneuvering equipment for heavy lifting of switchgear breakers and parts.
- Considerations for future plant growth should include cabinet spaces for the additions of future 5 kV circuit breakers.
- Changes in equipment technology and safety regulations for protection of O&M personnel should include additional planning and provisions for ample electrical room space.

The replacement of existing 5 kV switchgear will require larger electrical room than existing and the construction of a separate electrical building will required substantial capital due to the relocation of numerous underground conduits and wiring. Therefore, the analysis of the available real estate around the main electrical building reveals, that the least cost option would be to use the adjacent room space of the existing electric utility transformer vault and construct a separate small building/vault for FPL service transformers.

The proposed 5 kV switchgear layout is shown in Figure 6 and the proposed location for a new FPL transformer vault is shown in Figure 7

5.3 Improvements of 480 volts Equipment at Main Electrical Building

The original configuration of the 480 volts system at the main electrical building include four (4) 500 kVA substations (No.1, No.2, No. 9 and No. 10) with 480 volts switchboards that supply power to two (2) motor control centers (MCCs), previous effluent-deep well pumps and miscellaneous panels for receptacles and lighting. Due to the limited capacity of such 4 original substations, as additional pumps were needed, two additional substations and switchboards (No. 11 and No. 12) were installed to resolve the needed capacity at the time. As a result, the configuration of 6 substations and switchboards has filled the electrical room with multiple small capacity equipment, but no substantial provisions have been included for spare capacity neither convenience for future equipment replacement.

The master planning for the replacement of existing 480 volts equipment shall include a broader perspective, considering less quantity of transformers to be located outdoors and only two 480 volts switchgear(s) that will replace the function of 6 existing switchboards, plus provisions for ample spare capacity and future loads.

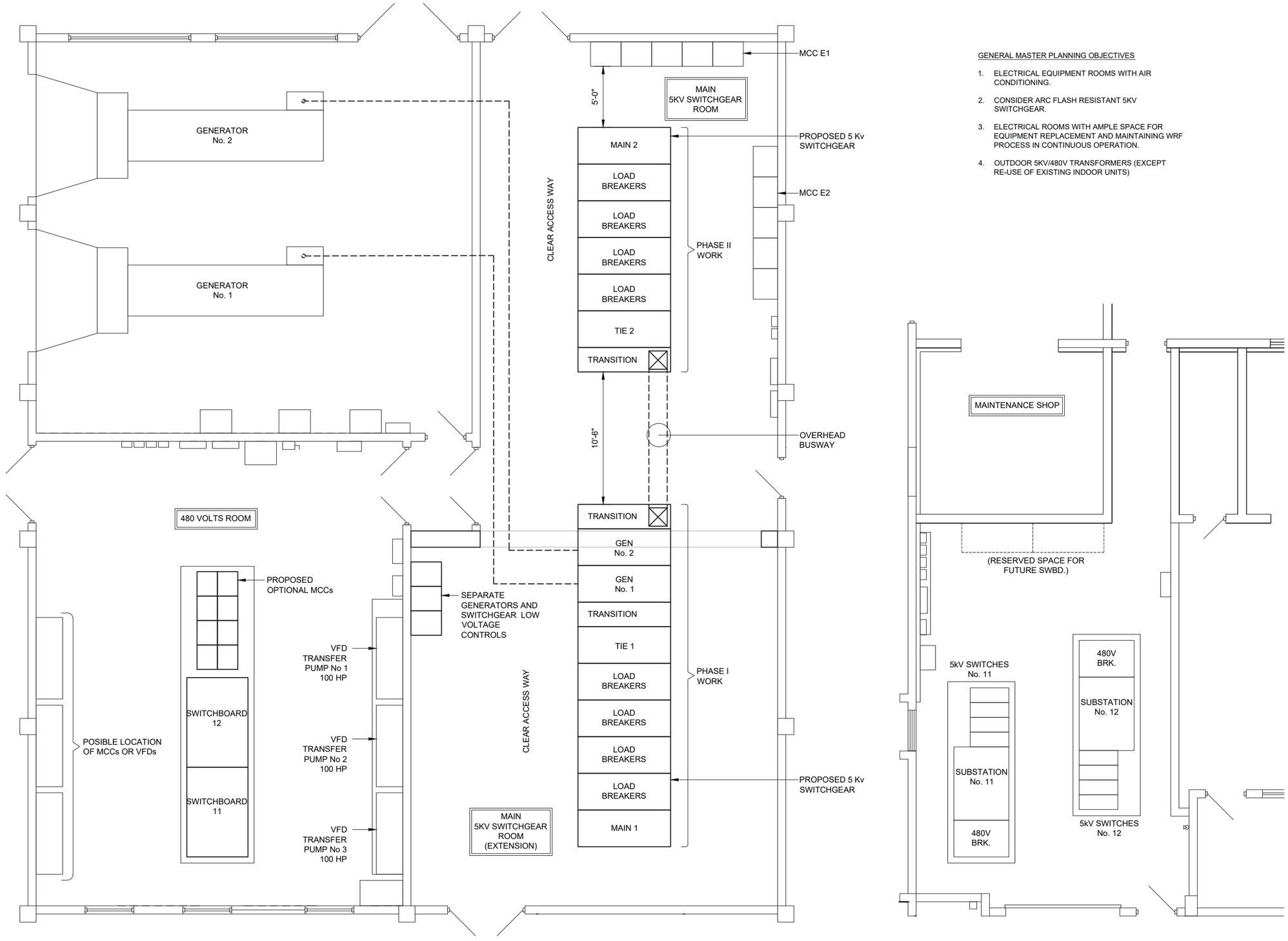
The indoor substations/transformers No. 11 and No. 12 located in the maintenance building were recently installed and their condition as of 2014 appears very good and reliable with expected life cycle of additional 25 years. These transformers could supply power to a set of double-ended switchgear scheme with plenty power capacity for the present connected 480 volts loads on the main electrical and administrative building.

If future process loads would require increase capacity of transformers No. 11 and No. 12, then future larger transformers could be installed outside of the main electrical building.

The proposed scheme of the 480 volts switchgear in the main electrical building is shown on the one line diagram in Figure 5 and the respective electrical room layout is shown on Figure 6.

5.4 Replace Indoor Substations with Outdoor Pad Mounted Transformers

Most of the existing indoor 5 kV to 480 V substations transformers consist of three key components: a 5 kV fusible switch, a 500 kVA dry type transformer, and a 480 V – 1200 Amperes switchboard. The advantages of indoor power transformers are the protection from humidity, corrosion, and nature events like hurricanes.



GENERAL MASTER PLANNING OBJECTIVES

1. ELECTRICAL EQUIPMENT ROOMS WITH AIR CONDITIONING.
2. CONSIDER ARC FLASH RESISTANT 5KV SWITCHGEAR.
3. ELECTRICAL ROOMS WITH AMPLE SPACE FOR EQUIPMENT REPLACEMENT AND MAINTAINING WRF PROCESS IN CONTINUOUS OPERATION.
4. OUTDOOR 5KV/480V TRANSFORMERS (EXCEPT RE-USE OF EXISTING INDOOR UNITS)

FIGURE No. 6
MAIN ELECTRICAL BUILDING
PROPOSED EQUIPMENT LAYOUT

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN

carollo

FIGURE No. 7
PROPOSED FP&L VAULT AND SWITCHGEAR LOCATION

MANATEE COUNTY - SWWRF
ELECTRICAL MASTER PLAN

carollo

However, the disadvantages are higher replacement cost, considerable space requirements in electrical rooms and exhaustion of heat losses into the room that result in higher capital and operating facility costs due to the need for air conditioning equipment and other temperature sensitive equipment in the room.

In today's market for outdoor transformers, the corrosion issues can be prevented with stainless steel enclosures and manufactured with thick metal resistant to high wind loadings. Therefore, the replacement of power transformers should consider the option to locate transformers outdoors and utilize the electrical rooms space for location of temperature and humidity sensitive equipment with provisions of air conditioning.

The planning for the replacement of existing substations throughout the plant shall consider less quantity of indoor transformers to be replaced with units located outdoors.

The proposed scheme of the multiple 480 volts systems is shown on the power one line diagram in Figure 5.

5.5 Proposed Location of Major 5 kV to 480 Volts Substations

The master planning for the location of new substations should not be based on replacing existing equipment at their present location. The quantity and location of the transformers shall be based on the power demand and pertinent location of major process equipment throughout the SWWRF. Additional review of the major process loads location reveals the following:

- The aeration blowers loads represent the largest power demand equipment and these loads will continue being supplied by the 5 kV motor control centers located at the Northeast side of the plant. Therefore, these 5 kV loads are independent of 480 volts.
- A set of two backup 300 HP aeration blowers will be installed as part of the project for nitrogen removal .The project will add two (2) 1,000 kVA transformers and 480 V MCC for the blowers and (2) 500 kVA transformers and 480 V MCC for power to the anoxic basins (converted primary clarifiers). The future master planning for the replacement of such equipment should consider only two (2) transformers with sufficient capacity for both the 480 volts aeration blowers and the anoxic basins, including the loads of the nearby headworks.
- The 480 volts effluent pumps for the County's Master Reuse System represent the second largest power demand and it is supplied by two (2) 2000 kVA substations Nos. 13 and 14 that were recently installed.
- The process 480 volts loads for the secondary clarifiers, RAS pumps, the effluent transfer pumps, the disinfection equipment, and the loads in the electrical building and control building could be supplied with two (2) transformers in lieu of 6 units.

- The sludge holding tanks and dewatering treatment process is located in a separate area, where power can be supplied with only two (2) transformers in lieu of 4 existing units.

5.6 Replacement of Power Feeders and Branch Wiring

The replacement of major 5 kV and 480 volts switchgear, substations-transformers and motor control centers would require the replacement of most field wiring interconnected with the equipment, because most of the wiring is over 25 years old and the condition of the wire insulation is decaying with time. An estimated opinion of construction cost for replacement of field wiring is included in each of the recommended items in section 6.0

5.7 Requirements for Temporary Power during Equipment Replacement.

The future electrical designs for implementing the replacement of existing electrical equipment shall include reliable schemes for temporary power and clear resolutions for construction phasing and constraints, in order to maintain continuous power for process equipment. An estimated opinion of construction cost for temporary wiring is included in each of the recommended items in section 6.0

5.8 Recommended Power Monitoring and Protection System.

The functionality of the electrical power system is essential for reliability of the SWWRF treatment process and high service pumping, so the new 5 kV and 480 V equipment should include state of the art features in power quality meters, protective devices for transient voltage surges caused by lightning, and electronic relays for the fast tripping of circuit breakers due to possible short circuits or overloads. The design of the new 5 kV and 480 V equipment should be interconnected with the existing facility SCADA system, for SWWRF operation staff to continuously monitor normal status and/or any alarm conditions.

Most of the modern electronic power meters and protective relays include communication features such as “Ethernet protocol” that would easily communicate and transfer electrical system data to the SCADA system via the existing process logic controllers (PLCs).

6.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS WITH OPINIONS OF PROBABLE CONSTRUCTION COST

The summary of recommendations and the included opinion of cost can be used as a basis for capital improvement projects (CIP) budget projections and scoping of work to design and construct the vital improvements in separate construction phases.

The assessment of the existing 5 kV switchgear, 5 kV generators, substation 5 kV switches, indoor 5 kV to 480 volt transformers and 480 volt motor control centers revealed that:

- Most of the existing equipment installed since 1988 is reaching the end of its useful duty cycle
- Numerous pieces of electrical equipment are obsolete due to progressive changes in electrical technology and/or lack of spare parts,
- The older electrical equipment is deteriorating because it is located in electrical rooms without air conditioning, with ventilation from humid environment and some electrical rooms like adjacent to the headworks structure is exposed to a corrosive environment with hydrogen sulfide gas..
- The 5 kV switchgear layout in the main electrical room does not have enough room space for the layout of new larger switchgear, while 5 kV equipment shall be continuously energized for keeping the plant in operation. Therefore, it will be necessary to increase the size of the electrical room.
- The quantity of 5kV/480 V substation transformer have increased to a total quantity of 20 units over 25 years, because the original design did not include spare capacity in transformers and 480 volts switchboards, for supplying power to additional process loads. The maintenance of such large quantity of substation transformers represents substantial operating cost and may require significant capital for asset replacement.
- Most of the electrical equipment that is over 25 years old should be replaced within 5 to 10 years (between 2014 through 2024), for assurance to maintain a reliable and safe power distribution system.

The recommendations for an upgrade of the power distribution system, from a master planning perspective, are summarized as follows:

6.1 Add Air Conditioning to Main Electrical Rooms

The addition of air conditions in key electrical rooms has been included with the list of short term improvements, in section 4.0, paragraph 4.1

These improvements should be implemented in three key electrical rooms: the two (2) rooms located adjacent to the generator room and the FPL vault; and the room located adjacent to the maintenance building. The recommended improvements should be constructed within two years or by 2016, and the planning level cost estimate is $203,018, as shown in Table 3.

Table 3	Probable Construction Cost - Air Conditioning for Main Electrical Rooms Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Remove existing wall louvers for ventilation	$5,000
2	New insulation ceilings and walls	$15,000
3	New insulated doors	$15,000
4	Air condition equipment & ductwork for three electrical rooms	$60,000
5	Acoustic panels or improvements in ceiling insulation	$12,000
6	Wiring and conduits	$6,000
7	Subcontractor Field and Project Management	$7,000
	TOTAL DIRECT COST	**$120,000**
	Contingency (25%)	$30,000
	Subtotal	**$150,000**
	General Conditions[(1)] (10%)	$15,000
	Subtotal	**$165,000**
	Contractor Overhead, Profit & Risk (±15%)	$25,000
	Subtotal	**$190,000**
	Sales Tax[(2)] (±6%)	$4,000
	SUBTOTAL PROJECT COST	**$194,000**
	Owner's Reserve for Change Orders (5%)	$10,000
	TOTAL PROJECT COST	**$204,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

6.2 Intercept 5 kV Feeders at Headworks and Extend to New Transformers for the Anoxic Basins

The interception of the underground 5 kV feeders outside of the headworks structure has been included with the list of short term improvements, in above section 3.0, paragraph 3.2, because the existing indoor 5 kV substation transformers Nos. 3 and 4, and MCCs HW-1 and HW-2 are in poor and decaying condition due to excessive corrosion.

The schedule for the subject improvements should be coordinated with the new headworks structure that is scheduled for construction in 2018. The planning level cost estimate is $221,000 as shown in Table 4.

6.3 Add Separate Underground 5 kV Feeders for Aeration Blowers

The addition of the separate underground 5 kV feeders for the northeast aeration blower building has been included with the list of short term improvements, in above section 4.0, paragraph 4.3.

Table 4	Probable Construction Cost - Intercept 5 kV Feeders for Anoxic Basins Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Intercept existing 5: Electrical Underground Ducts and Cables	$15,000
2	Conflicts with Mechanical, Excavation & Shoring; Forms for Manhole	$15,000
3	New cast in place 7'x7'x 6.6" manhole; Backfill and Patch for Underground Work	$15,000
4	Trench and PVC conduit, ductbank work	$25,000
5	Extend conduits and cables to transformers No. 3A and 4A (for Anoxic Basins)	$20,000
6	5 kV – 3# 500 KCM – Type MV-105 Cables & Terminations	$30,000
7	Electrical Subcontractor Field and Project Management	$10,000
8	Supply power from Anoxic Basins Electric Building to headworks and Clarifiers No. 3 – No. 4 would be included in future headworks structure	N/A
	TOTAL DIRECT COST	**$130,000**
	Contingency (25%)	$33,000
	Subtotal	**$163,000**
	General Conditions (1) (±10%)	$16,000
	Subtotal	**$179,000**
	Contractor Overhead, Profit & Risk (±15%)	$27,000
	Subtotal	**$206,000**
	Sales Tax (2) (±6%)	$4,000
	SUBTOTAL PROJECT COST	**$210,000**
	Owner's Reserve for Change Orders (5%)	$11,000
	TOTAL PROJECT COST	**$221,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

The proposed 5 kV feeders should be routed towards the northeast part of the facility via additional underground electrical ductbanks and manholes.

The schedule for the subject improvements should be as soon as possible or within 4 years or by 2018 and the planning level cost estimate is $377,000, as shown in Table 5.

Table 5	Probable Construction Cost - Separate 5 kV Feeder for Aeration Blowers Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Add 4" exposed conduits from 5 kV main switchgear to outside manholes	$25,000
2	Conflicts with Mechanical, Excavation & Shoring; Forms for Manholes	$30,000
3	Three precast 6'x7'x 6.6" manholes; Backfill and Patch for Underground Work	$45,000
4	Trench and PVC conduit, ductbank work	$55,000
5	Add 4" exposed conduits to exist 5 kV motor control center	$20,000
6	5 kV – 3# 250 KCM – Type MV-105 cables & terminations	$32,000
7	Disconnect and remove cables between north and south aeration buildings.	$5,000
8	Electrical Subcontractor Field and Project Management	$10,000
	TOTAL DIRECT COST	**$222,000**
	Contingency 25%	$56,000
	Subtotal	**$278,000**
	General Conditions (1) (±10%)	$28,000
	Subtotal	**$306,000**
	Contractor Overhead, Profit & Risk (±15%)	$46,000
	Subtotal	**$352,000**
	Sales Tax (2) (±6%)	$7,000
	SUBTOTAL PROJECT COST	**$359,000**
	Owner's Reserve for Change Orders 5%	$18,000
	TOTAL PROJECT COST	**$377,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

6.4 Remove Substation Nos. 5 and. 6 and Replace MCCs B1-B4 in Electrical Rooms for Aeration Blowers and DAFT System

The existing indoor 5 kV substation transformers No. 5 and No. 6 and related MCCs B1 through B4 contain very few electrical loads since much of the load was eliminated when the aeration blowers (AB-1 through AB-5) were constructed in the 1998 expansion. Therefore, the subject equipment and their large electrical capacity are not justifiable for the remaining connected load.

The indoor 5 kV substation transformers No. 5 and No. 6 could be removed and the source power obtained from the anticipated new outdoor transformers that will be installed as part of the SWWRF Nitrogen Removal project, for the 480 V supply power to new MCCs B1 and B2.

The schedule for the subject improvements could be flexible, perhaps within 5 years or by 2019 and the planning level cost estimate is $522, 000, as shown in Table 6.

Table 6	Probable Construction Cost - Remove Substations Nos. 5 & 6 and Replace MCC's B1 - B4 Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Temporary power to keep existing compressors equipment in operation	$15,000
2	Remove substations No. 5. No. 6 and MCCs B1-B4	$10,000
3	Conduit work and supports	$55,000
4	480 Volt cable work	$30,000
5	New MCCs B1 and B2 (replace 4 MCCs B1-B4)	$80,000
6	New conductors from new MCCs to existing loads	$12,000
7	Installation and testing of electrical equipment	$20,000
8	Interconnection new MCCs to transformers (Part of Nitrogen Rem. Project)	$25,000
9	New insulated doors, insulate walls and ceiling	$15,000
10	Air conditioning in electrical rooms	$30.000
11	Electrical Subcontractor Field and Project Management	$15,000
	TOTAL DIRECT COST	**$307,000**
	Contingency (25%)	$77,000
	Subtotal	**$384,000**
	General Conditions (1) (±10%)	$39,000
	Subtotal	**$423,000**
	Contractor Overhead, Profit & Risk (±15%)	$64,000
	Subtotal	**$487,000**
	Sales Tax (2) (±6%)	$10,000
	SUBTOTAL PROJECT COST	**$497,000**
	Owner's Reserve for Change Orders (5%)	$25,000
	TOTAL PROJECT COST	**$522,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

6.5 Replace Substation Nos. 7 and 8 and MCCs DW1, DW2, D1 and D2 in Digesters and Dewatering Process Area

The existing indoor 5 kV substation transformers Nos. 7 and 8 and related MCCs DW1, DW2, D1, and D2 contain few remaining electrical loads and their transformer capacity is not justified for the remaining connected load, because the new transformers and MCCs included with the aerobic digesters project will supply most of the power in the solids treatment area. Therefore, the 5 kV substation transformers Nos. 7 and 8 could be replaced with new pad mounted outdoor transformers similar to units included with the anaerobic digester conversion project, for the supply of 480 V power to new MCCs DW-1 and DW2 in the dewatering area and new smaller MCCs D1 and D2 on the second floor of the digester control building.

The new MCCs DW-1 and DW-2 will maintain their current function, and will include additional capacity to supply power for the maintenance building and the new MCCs D1 and D2.

The schedule for the subject improvements could be flexible, perhaps within 5 years or by 2019 and the planning level cost estimate is $785,000, as shown in Table 7.

6.6 Remove Substation Nos.1 and 2 and Related 480 V Switchboards

The existing indoor 5 kV substation transformers Nos. 1 and 2 located in the engine-generator room supply power to critical loads for switchgear control power and loads in the administration building. The location of the substation transformers, the related switchboards, and Generator No. 1 could affect each other during a major electromechanical engine or substation fire incident.

Upon relocation of the existing effluent pumps to the new high service pumping station, substation transformers No. 1 and No. 2 could be removed. Their electrical loads could be connected to spare circuit breakers in existing switchboards No. 11 and No. 12, because these switchboards would have spare capacity upon construction completion of the high service pumping station, or the loads from removed substation No. 1 and No. 2 could be connected to a new switchgear No. 11 and No. 12 as proposed in paragraph 6.8

The schedule for the removal of substation No. 1 and No. 2 could be flexible, perhaps within 2 to 4 years or by 2018 and the planning level cost estimate is $548, 000, as shown in Table 8. This estimated cost includes replacement of MCCs E1 and E2 and miscellaneous lighting panelboards in the main electrical room. However, replacement of this equipment is not urgent and it could be done at a later date, if air conditioning is added within 1 or 2 years to the main electrical rooms.

6.7 Remove Substation Nos. 9 and 10 and Related 480 V Switchboards

Upon relocation of the existing effluent pumps to the new high service pumping station, there will be no remaining loads connected to substation transformers No. 9 and No. 10 therefore; they could be removed from their indoor location. Another option to reuse switchboards Nos. 9 and 10 could be for power to the 480 V MCCs Nos. E-1 and E-2 located in the main switchgear electrical room.

The schedule for these proposed modifications could be flexible, perhaps within 5 years or by 2019 and the planning level cost estimate is $61,000, as shown in Table 9.

Table 7	**Probable Construction Cost - Replace Substations No. 7 & 8 and MCCs DW1, DW2, D1 & D2, Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities**	
No.	**Description**	**Total**
1	Temporary power to keep existing process equipment in operation	$15,000
2	Remove substations No. 7 and No. 8 and MCCs D1–D2 and DW1-DW2	$20,000
3	Underground and exposed conduit work and supports	$35,000
4	480 Volt cable work	$40,000
5	New MCCs DW1, DW2, D1 and D2 (replace 4 MCCs)	$110,000
6	Two new 5kV/480V Pad mounted transformers & switches	$100,000
7	New Conductors from new MCCs to existing loads	$18,000
8	Installation and testing of electrical equipment	$40,000
9	Interconnect new MCCs to outdoor transformers	$25,000
10	New insulated doors, insulate walls and ceiling	$15,000
11	Air conditioning in electrical rooms	$20,000
12	Electrical Subcontractor Field and Project Management	$25,000
	TOTAL DIRECT COST	**$463,000**
	Contingency (25%)	$116,000
	Subtotal	**$579,000**
	General Conditions (1) (±10%)	$58,000
	Subtotal	**$637,000**
	Contractor Overhead, Profit & Risk (±15%)	$96,000
	Subtotal	**$733,000**
	Sales Tax (2) (±6%)	$14,000
	SUBTOTAL PROJECT COST	**$747,000**
	Owner's Reserve for Change Orders (5%)	$38,000
	TOTAL PROJECT COST	**$785,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

Table 8	Probable Construction Cost - Remove Substations Nos. 1 & 2 and Replace MCCs E-1 & E-2 Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Temporary power to keep existing process equipment in operation	$20,000
2	Remove substations No. 1 and No. 2 and MCCs E-1 and E-2	$10,000
3	Overhead conduit work and supports	$40,000
4	480 Volt power cable and control wiring	$35,000
5	New MCCs E-1 and E-2	$80,000
6	New Conductors from new MCCs to existing loads	$50,000
7	Installation and testing of electrical equipment	$40,000
8	Interconnection – New MCCs to new switchgear No. 11 & No. 12	$15,000
9	New panelboards for instruments and lighting	$18,000
10	Electrical Subcontractor Field and Project Management	$15,000
	TOTAL DIRECT COST	**$323,000**
	Contingency (25%)	$81,000
	Subtotal	**$404,000**
	General Conditions (1) (±10%)	$41,000
	Subtotal	**$445,000**
	Contractor Overhead, Profit & Risk (±15%)	$67,000
	Subtotal	**$512,000**
	Sales Tax (2) (±6%)	$10,000
	SUBTOTAL PROJECT COST	**$522,000**
	Owner's Reserve for Change Orders (5%)	$26,000
	TOTAL PROJECT COST	**$548,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

Table 9	Probable Construction Cost - Remove Substations Nos. 9 & 10 Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities	
No.	**Description**	**Total**
1	Remove substations No. 9, No. 10 and associated conduit & wiring	$20,000
2	Patch floor's finish	$10,000
3	Electrical Subcontractor Field and Project Management	$5,000
	TOTAL DIRECT COST	**$35,000**
	Contingency (25%)	$9,000
	Subtotal	**$44,000**
	General Conditions (1) (±10%)	$5,000
	Subtotal	**$49,000**
	Contractor Overhead, Profit & Risk (±15%)	$8,000
	Subtotal	**$57,000**
	Sales Tax (2) (±6%)	$1,000
	SUBTOTAL PROJECT COST	**$58,000**
	Owner's Reserve for Change Orders (5%)	$3,000
	TOTAL PROJECT COST	**$61,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

6.8 New 480 V Switchgear for Replacement of Switchboards No 1, 2, 9,10,11 and 12.

The existing switchboards No. 9 - No. 10, and No. 11 - No. 12 and two 5 kV breakers for the generators occupy a large portion of the floor space in the existing 480 volts main room., but the individual equipment does not have ample spare capacity for future loads.

The replacement of the existing NEMA type switchboards is recommended using a higher grade equipment such as ANSI switchgear.

The schedule for the replacement of existing switchboards could be flexible, perhaps within 4 to 5 years or by 2019 and the planning level cost estimate is $906,000, as shown in Table 10.

6.9 Replace Existing Main 5 kV Switchgear and Improve Main Electrical Room Adjacent to FPL Vault

The main 5 kV switchgear is the most important electrical asset in the SWWRF because it receives input power from the electric utility (FPL) and/or from the standby power generators, and supplies output power to the remote substations-transformers. This switchgear has been in service for 26 years and is reaching the end of practical, reliable condition; therefore, judicious planning for its replacement is recommended.

Table 10 Probable Construction Cost – Replace Switchboards Nos. 11 & 12 Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities

No.	Description	Total
1	Temporary power to keep existing process equipment in operation	$20,000
2	Remove switchboards No. 11 and No.12	$20,000
3	Overhead conduit work and supports	$45,000
4	480 Volt power cable and control wiring	$45,000
5	New 480V (ANSI) Switchgears No. 11 & No. 12	$300,000
6	New Conductors from new Switchgear to existing loads	$45,000
7	Installation and testing of electrical equipment	$45,000
8	Electrical Subcontractor Field and Project Management	$15,000
	TOTAL DIRECT COST	**$535,000**
	Contingency (25%)	$134,000
	Subtotal	**$669,000**
	General Conditions (1) (±10%)	$67,000
	Subtotal	**$736,000**
	Contractor Overhead, Profit & Risk (±15%)	$111,000
	Subtotal	**$847,000**
	Sales Tax (2) (±6%)	$16,000
	SUBTOTAL PROJECT COST	**$863,000**
	Owner's Reserve for Change Orders (5%)	$43,000
	TOTAL PROJECT COST	**$906,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

If air conditioning is added to the electrical room and electrical tests performed for assurance to improve any component, then the switchgear might be reliable to continue on duty for another 5 to 10 years, while capital budget is allocated for its replacement.

The existing main electrical room has limited space for installation of new 5 kV switchgear, while the existing 5 kV equipment is in service. The assembly of joining together multiple cabinet sections of the entire switchgear must be done in the field, because there is no ample room access for transporting heavy equipment in the room. Consequently, detailed design including work sequencing and careful planning would require for assurance of minimal errors during construction. Additionally, the installation of new 5 kV switchgear and new control panels will require provisions for temporary power equipment and rental of standby power generators during the transitions of removing old switchgear equipment and connecting new equipment.

The schedule for these proposed improvements could be flexible, perhaps within 5 to 10 years or ideally by 2019 and the planning level cost estimate is $3,013,000, as shown in Table 11.

6.10 Replace Existing 5 kV Switchgear for Synchronizing Standby Power Generators and Provisions of Separate Control Panels

The 5 kV switchgear, which includes the breakers for synchronizing of the two generators, supplies generator output power to the main 5 kV switchgear during failures of FPL utility power. This equipment appeared to be in fair condition however, the characteristics of the equipment should be improved and replaced at the same time as the main 5 kV switchgear; therefore, judicious planning for its replacement is in order. If air conditioning is added to the electrical room and electrical tests performed for assurance to improve any component, then this switchgear could be reliable for another 5 years. This would allow additional time for capital budget to be allocated for its replacement with the main 5 kV switchgear.

Additionally, the installation of generator’s 5 kV switchgear and new control panels may require provisions for temporary rental of standby power generators during the transitions of removing old switchgear equipment and connecting new equipment.

The schedule for these proposed improvements could be flexible, perhaps within 5 to 10 years or ideally by 2019 and the planning level cost Estimate is $813,000, as shown in Table 12.

Table 11	**Probable Construction Cost - Replace Main 5 kV Switchgear Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities**	
No.	**Description**	**Total**
1	Temporary power to keep existing process equipment in operation	$100,000
2	Remove half of existing 5kV switchgear in two phases	$30,000
3	Overhead conduit work and supports	$75,000
4	5kV - #350 KCM & #500 KCM Type MV-105 cables & terminations	$125,000
5	5kV switchgear	$950,000
6	Installation and testing of electrical equipment	$150,000
7	Provisions for construction sequencing and constraints	$50,000
8	Interconnection – new switchgear to existing loads(1)	$250,000
9	Electrical Subcontractor Field and Project Management	$50,000
	TOTAL DIRECT COST	**$1,780,000**
	Contingency (25%)	$445,000
	Subtotal	**$2225,000**
	General Conditions (2) (±10%)	$223,000
	Subtotal	**$2,448,000**
	Contractor Overhead, Profit & Risk (±15%)	$367,000
	Subtotal	**$2,815,000**
	Sales Tax (3) (±6%)	$54,000
	SUBTOTAL PROJECT COST	**$2,869,000**
	Owner's Reserve for Change Orders (5%)	$144,000
	TOTAL PROJECT COST	**$3,013,000**

Notes:
(1) Cost for replacement of generator's breakers & controls in separate table.
(2) Includes bonds, mobilization, insurance
(3) Based on 50% of Total Direct Cost

Table 12 Probable Construction Cost - Replace 5 kV Generator Breakers/Controls Southwest Water Reclamation Facility Electrical Master Plan Manatee County Utilities		
No.	**Description**	**Total**
1	Rent temporary generator for standby power	$50,000
2	Remove existing 5kV switchgear for generators	$10,000
3	Overhead conduit work and supports	$20,000
4	5kV - #500 KCM Type MV-105 cables & terminations	$30,000
5	5kV switchgear for synchronizing generators	$200,000
6	Separate low voltage control panels	$100,000
7	Installation and testing of electrical equipment	$20,000
8	Interconnection – New generator switchgear to new 5kV main switchgear	$25,000
9	Electrical Subcontractor Field and Project Management	$25,000
	TOTAL DIRECT COST	**$480,000**
	Contingency (25%)	$120,000
	Subtotal	**$600,000**
	General Conditions (1) (±10%)	$60,000
	Subtotal	**$660,000**
	Contractor Overhead, Profit & Risk (±15%)	$99,000
	Subtotal	**$759,000**
	Sales Tax (2) (±6%)	$15,000
	SUBTOTAL PROJECT COST	**$774,000**
	Owner's Reserve for Change Orders (5%)	$39,000
	TOTAL PROJECT COST	**$813,000**

Notes:
(1) Includes bonds, mobilization, insurance
(2) Based on 50% of Total Direct Cost

6.11 Other Improvements: Existing 480/208 V Miscellaneous Panels

In depth analysis and assessment of the existing miscellaneous equipment, such as 480 V transformers that step the voltage down to 120 V and miscellaneous panelboards that supply control power to instruments and lighting, was not included in the scope of the electrical master plan. However, suggestions are offered as an opinion of cost for the future replacement of panels in the maintenance building and the operations/control building and for allocation of capital budget.

The schedule for the above proposed improvements could be flexible, perhaps within 10 years or by 2024 and the planning level cost estimate is $200,000.

Note: a partial cost for replacement of low voltage control panels in the main electrical room has been included in Table 8.

6.12 Replacement of Standby Diesel-Engine Generator No. 2

The standby power generator No. 2 is the older generator at SWWRF. It was installed during the last major upgrade and expansion of the facility in 1988, which means it has been on duty for over 25 years, although the total run hours is very low and from a mechanical perspective the engine could last many more years. The change in federal regulations for engine exhaust gas emissions will eventually require the replacement of this unit and changes in engine technology will decrease the availability of future spare parts.

The schedule for replacing the generator could be flexible, perhaps within 5 to 8 years or ideally by 2019 and the planning level cost estimate is $1,300,000.

6.13 Periodic Maintenance Improvements

The electrical equipment requires periodic inspections and testing for verification of adequate insulation condition and assurance that conductive parts and bolted connections have not decayed due to possible overheating or corrosion. This periodic maintenance requires the momentary shutdown of energized equipment and use of sophisticated testing equipment.

The professional service of specialty testing companies is required and represents a periodic operating expense, as part of the plant budget for operation and maintenance. Therefore, a respective allowance in operating budget is recommended for periodic testing of electrical equipment.

6.14 Approach for Opinions of Probable Construction Cost

The generation of the construction cost opinions is based primarily upon Carollo's experience and judgment as a professional consultant. Since Carollo has no control over such factors as weather, cost and availability of labor, material and equipment, labor productivity, contractor's procedures and methods, competitive bidding, market conditions or other factors affecting such opinions or projections, Carollo does not guarantee that the actual rates, costs, etc. will not vary for the opinions and projections developed herein.

The conceptual cost estimates were developed to fulfill the need for a quick method of determining an approximate probable cost of a project without the benefit of detailed scope definition or any engineering design. These types of estimates fit the AACEI description of "Order-of-Magnitude" (Class 5) estimates. Since conceptual estimates are based on limited information, they are subject to considerable variation. Their accuracy depends on the amount and quality of the information available at the time of the estimate.

The approach for estimating the opinion of probable cost for future construction is based on the following criteria:

1. The cost estimating process did not include quantity take-off of materials, site plans or account for project constraints.
2. Equipment cost is a budget amount of typical list prices published by manufacturers.

3. Labor for installation cost is based on a multiplier comparable to the equipment cost.
4. Add-on costs for general conditions such as construction management, mobilization, temporary storage, and incidental work is included as a percentage of the basic construction.
5. A contingency of 25 percent was included based on the planning level nature of the estimates.

Tables 3 - 12 include the major elements of the construction cost associated with the proposed master planning for the replacement of the 5 kV equipment and 480 V equipment.

7.0 SUPPLEMENTAL CRITERIA FOR ELECTRICAL UPGRADES

The provisions of electrical standards and guidelines, for design and major upgrades or replacement of the key power distribution equipment to the water reclamation facilities is beyond the scope of the subject electrical master plan.

Nevertheless, the basic approach and criteria for upgrading the existing power distribution system should be based upon the experience of plant personnel from all water reclamation facilities in the County Water Utilities Department, a requirement for safety by design, simple maintenance procedures and minimum inventory of spare parts. The minimum criteria for upgrades might be based on the following guidelines:

Use state of the art features in technology for power distribution in the wastewater treatment industry, as a guideline for consistency of standards to follow during future designs, to provide safe and reliable functionality, and also to increase safety, operability, redundancy, and ultimately, increase value and minimize capital for construction and future maintenance.

Flexibility and electrical rooms space for future additions to the SWWRF should be considered from a process perspective, as an allowance for load growth within the electrical power system.

- All electrical rooms shall have ample dedicated space for required equipment; adequate clearances required by code; large doors for access of machinery and transporting heavy parts or equipment sections; air conditioning equipment for the electrical room shall not interfere with clearances for electrical equipment; room space shall not be used for storage of non-electrical items.
- Rooms for electrical equipment shall not be located adjacent to buildings or structures with presence of hydrogen sulfites and other corrosive gases, such as no electrical room at headworks structure, biosolids dewatering or drying process. If the electrical rooms are near or adjacent to such structures, then there shall not be access doors or ventilation openings that allow entry of corrosive gases or humidity.
- Follow the EPA Class 1 reliability criteria for design, including the distribution of process equipment loads in separate power sources, that facilitate maintenance with de-energize equipment.

- Follow the NFPA-820 guideline, Standard for Fire Protection in Wastewater Treatment and Collection Facilities
- Include Safety by Design for 5 kV switchgear and 480 V equipment, to facilitate maintenance with de-energize equipment. Provide control features considering minimum arc flash risk for personnel during operations and/or maintenance.
- Include separate low voltage controls for medium voltage equipment, to minimize the risk of arc flash for operating personnel
- Specify circuit breakers with manual selector switch for setting instantaneous trip of the breaker during momentary system maintenance and reducing incident energy levels, thus allowing reduced levels of PPE to be used, offering an improvement to worker comfort and mobility.
- Preferable specify 480 volt switchgear with power breakers, manufactured per ANSI C37 standard and UL 1558 standard, because it withstand a 30 cycle short circuit, in lieu of switchboards that only include a 3 cycle withstand rating, for the supply of power to downstream MCCs.
- Specify outdoor type pad mounted transformers with less flammable insulating fluid, with capacity rating for 55 degrees Celsius, and enclosures made of 316 stainless steel with a powder coated green finish. Also, specify primary selector switches for transformers that would allow redundant source of input power to the transformer.
- Do not install large power transformers indoors, to avoid their heat exhaust into electrical rooms and for reducing energy cost of air conditioning.
- Specify MCCs with separate cabinet for the MCC main circuit breaker, not with common open bus to adjacent MCC sections, to avoid propagation of arc flash into entire MCC lineup. Also, main circuit breaker should include RELT controls switch on the trip unit, for reducing incident let through energy during maintenance, in order to assure very low level of arc flash category at the MCC equipment.
- Specify transient voltage surge suppression for all power distribution equipment, including switchgear, switchboards, MCCs, and panelboards.
- Underground manholes need ample space for working clearances. The minimum dimensions for electrical manholes for conductors up to 480 V should be 6 ft x 6 ft x 6.5 ft or larger depending on the size and quantity of power cables. All cables shall be supported on cable racks with ample clearance for cable pulling or replacement.
- The minimum dimensions for electrical manholes with 5 kV conductors should be 6 ft x 7 ft x 6.5 ft or larger depending on the size and quantity of power cables. All cables shall be supported on cable racks with ample clearance for cable pulling or replacement.

- Medium voltage cables for 5 kV applications need a higher voltage rating of at least 8 kV at 133% insulation.
- All indoor electrical equipment needs to be placed in air-conditioned space to prevent corrosion due to humidity in Florida and the corrosive environment at the water reclamation facility.
- Enclosures for outdoor and exposed electrical equipment that contains power and/or controls shall be made with 304 stainless steel or aluminum material and white powder coated finish to resist corrosion and reflect sunlight heat.

APPENDIX A – ADDITIONAL FIGURES WITH EQUIPMENT ASSESSMENT (ISSUES) AND RECOMMENDATIONS

The condition assessment of each electrical equipment item and the pertinent recommendations are shown on the following pages:

Issues with Existing 5kV Main Switchgear

- Near the End of its Useful Life after 26 years on Duty.
- Manufacturer May Discontinue Spare Parts for Protective Relays.
- High Incident Energy and Arc Flash Risk for Personnel, If Necessary to Troubleshoot with Open Front Panels.

Engineer Recommendation:

- Add A/C to Electrical Room to Extend Equipment Life
- Add Operating Procedures & De-energize Half Section if Front Covers are Opened
- Replace in 5 to 10 years
- Future Separate Low Voltage Controls for Personnel Safety
- Frequent Periodic Testing for Assurance of Reliability

Issues: Interconnection w/ 5 kV Breaker for Generators 1 and 2:

- Generator Connection Limited to Left Half Section = Partial Reliability
- Existing Configuration Not Flexible for Replacements. Would Require Careful Planning

Engineer Recommendation:

- Future Replacement Should Include Second Tie Breaker in Mid- Section.
- Interconnect with Generators at Mid-Section Between Tie Breakers.
- Add Metering for SCADA Power Management.

Figure A1
5 kV Switchgear Assessment

Issues with Breaker from Generators 1 and 2 Power and 5kV Switchgear

- 5 KV Breaker for Gen. Power Supplied / Built by ASCO
- 5 kV Switchgear is Square D.
- Controls are interconnected between both products
- Who Provides Maintenance ?

Engineer Recommendation:

- Future New Switchgear shall be from a One Manufacturer for Warranty and Repairs
- Specify Separate Low Voltage Controls from 5 kV Cabinet for Better Personnel Safety

Assessment of 5 kV Breakers and Controls for Generators 1 and 2:

- Overall Condition is Acceptable but Controls Are Limited for Doing Easy Manual Operation During Emergency
- Fire Incident in One Breaker Cell Could Affect or Spread to Adjacent Breaker For Other Generator.
- Failure of Common Controls Would Inhibit Running Both Generators.

Engineer Recommendation:

- Replace at Same Time with 5 kV Main Switchgear.
- Add Third Circuit Breaker to interconnect with Main 5 KV Switchgear (photo above)
- Add A/C to Room to Extend Life Until Capital Budget is Available

Figure A2
Generator's 5 kV Breakers And Controls

Issues with Existing Substations No. 1 & No. 2:

- Near the end of its useful life after 26 years on duty.
- Progressive Corrosion Due to Room Humidity.
- A Major Mechanical or Fire Incident Could Cause Damage Between Substation & Generator No. 1.

Engineer Recommendation:

- Remove Substations No 1 & No 2 and Do Not Replace.
- Use Spare Power Capacity in Substation's No. 9, 10 or No. 11,12 to Supply Power to Loads in MCCs E1 and E2.

Comment About Low Voltage Transformer adjacent to Substation No. 2 (Left Side of photo)

- Condition Appears Fine for its Age.

Engineer Recommendation:

- Transformer and Switch Location May Remain In Generator Room, But Replace Upon Upgrades to Other Low Voltage Equipment.

Figure A3
Substations No. 1 & No. 2 Assessment

Issues with Existing 480V MCC E-1:

- Near the end of its useful life after 26 years on duty.
- May Have High Magnitude of Incident Energy for Arc Flash Due to Non Adjustable Tripping Feature From the Switchboards on Substation No. 1 & No. 2.
- Function Should be for Critical Loads In the Main Electrical Room.
- Less Critical Loads for Outside the room Should be In Separate MCC

Engineer Recommendation:

- Future Replacement Should Include a Separate MCC for Non-Critical Loads.
- Consider Adding Separate MCC in Electrical Room With Switchboards No. 11 & No. 12

Issues with Existing 480V MCC E-2:

- Same Comments Above for MCC E-1

Engineer Recommendation:

- Same Comments Above for MCC E-1

Figure A4
MCC E-1 & MCC E-2 Assessment

Issues with Existing 480V Substations No. 3 & No. 4:

- Near the end of its useful life after 26 years on duty.
- Severe Corrosion Due to Humidity and Headworks H^2S Gases.
- Connected Load is a Small Fraction of Electrical Capacity.

Engineer Recommendation:

- Demolish in its Entirety and Do Not Replace
- Relocate the Input 5 kV Feeders to New Manhole Outside and Extend 5 KV Feeders to Anoxic Basins.

Issues with MCC HW1 & MCC HW2:

- Severe Corrosion Due to Humidity and Headworks H^2S Gases.
- Connected Load is a Small Fraction of Electrical Capacity.
- Most Motor Starters are not being used.

Engineer Recommendation:

- Demolish in its Entirety and Do Not Replace.
- Supply Power to Headworks Equipment and to Secondary Clarifiers No. 3 and No. 4 from Newer MCC at Anoxic Basins Electrical Room.

Figure A5
Substations No. 3 & No. 4 and MCCs HW1 & HW2

Issues with Existing Substations No. 5 & No. 6:

- Near the end of its useful life after 26 years on duty.
- Severe Corrosion Due to Humidity and No A/C in the Room.
- Branch Breakers Do Not Have Adjustable Tripping to Reduce High Incident Energy to MCCs.
- Connected Load is a Small Fraction of Electrical Capacity.

Engineer Recommendation:

- Remove 5 kV Switch & Transformer.
- Replace Switchboards Only and Add Air Conditioning to electrical room space.
- Specify Branch Circuit Breakers With Adjustable Trip Settings.

Issues with MCCs B1 – B4:

- Progressive Corrosion Due to Humidity in the Room.
- Connected Load is a Small Fraction of Electrical Capacity.
- Most Motor Starters are not being used.

Engineer Recommendation:

- Replace 4 MCCs With Only Two MCCs
- Future New MCCs Shall Have Main Circuit Breaker in Separate Cabinet.
- Main Input Breaker Shall Have Adjustable Trip Settings and Instantaneous Tripping Feature

Figure A6
SubstationS No. 5 & No. 6 and MCCs B1 – B4

Comments About Existing 5 kV MCC for Blowers:

- Apparent Condition is Acceptable
- Lack of Arc Flash Labels to Inform Personnel about Category of Incident Energy.
- 5 KV Input Power Cables from other Substations May Be Overloaded

Engineer Recommendation:

- Add Separate 5 KV Input Power Feeders from the Main 5 KV Switchgear, for Assurance of Reliability to Aeration System

Comments About MCC-1 to Power Blower's Valves:

- Power to All Blower's Valves In One Power Source.

Engineer Recommendation:

- Add Second MCC and Distribute Power for Blower's Valves on Separate MCCs

Figure A7
Blowers 5kV MCC & 480V MCC-1 Assessment

Issues with Existing 480V Substations No. 7 & No. 8:

- Near the end of its useful life after 26 years on duty.
- Progressive Corrosion Due to Humidity and H^2S Gases from Dewatering Process.
- Branch Breakers Do Not Have Adjustable Tripping to Reduce High Incident Energy to MCCs.
- Connected Load is a Small Fraction of Electrical Capacity.

Engineer Recommendation:

- Remove 5 kV Switch & Transformer.
- Add Air Conditioning to electrical room space.
- Do Not Have Doors or Openings between the Electrical Room and GBT Dewatering Process.
- Specify Branch Circuit Breakers With Adjustable Trip Settings.

Issues with MCC DW1 & MCC DW2:

- Progressive Corrosion Due to Humidity in the Room.
- Near the end of its useful life after 26 years on duty.

Engineer Recommendation:

- Replace With Larger Capacity MCCs and Get Input Power From New Outdoor Transformers.
- Use New MCCs DW1 & DW2 to Supply Power to Remote MCCs D1 & D2.

Figure A8
SubstationS No. 7 & No. 8 and MCCs DW1 & DW2

Issues with Existing MCC D1 & D2:

- Near the end of its useful life after 26 years on duty.
- Progressive Corrosion Due to Humidity in the Room.
- Connected Load is a Small Fraction of Electrical Capacity.

Engineer Recommendation:

- Replace With Smaller New MCC
- MCC Main Breaker Shall Be in Separate Cabinet with Adjustable Trip Settings
- Add Air Conditioning to Electrical Room Space.

Issues with Existing LRC Drives adjacent to MCCs D1 & D2 :

- Equipment is Disconnected and Not Being Used.

Engineer Recommendation:

- Remove Non-used Equipment.

Figure A9
MCC D1 & MCC D2 Assessment

Issues with Existing 480V Substations No. 9 & No. 10:

- Apparent Condition Looks Fine.
- There will be no Connected Load After Completion of Water Reuse High Service Pumping Project.

Engineer Recommendation:

- Maybe Use to Supply Power to Loads of Substation No. 1 & No. 2, or,
- Remove in its Entirety.

Issues with Deep Well Pumps VFDs:

- High Temperature in the Room due to non A/C.
- VFD Functioning With Open Doors for Ventilation. It Might Be An Arc Flash Hazard to Operating Staff.
- Life of VFD Equipment is Decreasing Due to High Room Temperature.
- VFD Doors Shall Be Closed to Minimize Risk of Arc Flash Hazard to Personnel.

Engineer Recommendation:

- Add A/C to the Room.

Figure A10
Substations No. 9 & No. 10 and D. W. Pumps VFDs

Comments About 5 kV Switches and Substations No. 11 & No. 12:

- Age and Condition of Equipment Is Like New Due to Few Years On Duty
- Progressive Corrosion May Become Apparent Due to Humidity and No A/C in Room

Engineer Recommendation:

- Add Air Conditioning to electrical room space

Comments About 480V Switchboards No. 11 & No. 12:

- Connected Load Would Be a Small Fraction of Electrical Capacity, Upon Completion of Water Reuse High Service Pumping Station Project.
- Progressive Corrosion May Become Apparent Due to Humidity and No A/C in Room

Engineer Recommendation:

- Consider Adding Circuit Breakers to Supply Power to MCCs E1 and E2, in Lieu of Using Substation No. 1 & No.2, or…
- Consider Future Replacement with 480 Volts Switchgear Using Power Breakers in Lieu of Molded Case Breakers

Figure A11
5kV SWs, Substations & 480V SWBRDs
No. 11 & No. 12 Assessment

Comments About 480V Switchgear No. 13 & No. 14:

- New Condition at the Time of This Assessment
- The Electrical Configuration And Characteristics May be a Model of Criteria for Future 480 Volts Switchgear at SWWRF.
- Separate Cabinet With Low Voltage Controls Would Have Been A Great Feature…. Oh Well, May Be in Future Equipment.

Engineer Recommendation:

- Implement Maintenance Program for Periodic Testing Every 5 Years, to Assure Long Term Reliability

Figure A12
Substations No. 13 & No. 14 Assessment

APPENDIX B – TECHNICAL DATA OF STATE OF THE ART ELECTRICAL EQUIPMENT

Basic technical data, features and characteristics of present technology for electrical products are shown on the following pages, for convenience of understandings available equipment for replacement of existing.

Additional figures with other products and respective data will be included in the final Technical Memorandum, including review comments and product preference from County staff.

5 kV Non- Arc Flash Resistant Switchgear State of the Art Features:

- The switchgear assembly contains insulating materials, protective and control devices, electrical contacts, and operating mechanisms, which must be protected against dirt, moisture, cement dust, foreign materials, corrosive atmospheres, and extreme temperature change.
- The most important element of the 5 kV switchgear is the vacuum interrupter, in combination with state of the art electronic relays, which delivers fast, quiet switching and precise arc extinction with adequate protection for equipment and the loads.
- Front accessible circuit breaker operating mechanism for ease of maintenance
- Closed door racking
- Floor rollout circuit breaker in lower cell without a dolly
- Visible secondary disconnect
- Circuit breaker ships inside of cell, thus reducing installation cost and transit damage
- Electronic Protective Relays for Protection of Equipment and Loads
- Uses the latest developments in vacuum interrupter technology
- Highly reliable vacuum interrupters - MTTF over 57,000 years
- Common type 3AH3 operator platform for all ratings
- Generator circuit breakers (to IEEE C37.013 optionally available)
- 10,000 operations to overhaul
- Three-cycle interrupting time (optional)
- Meets or exceeds the latest ANSI, IEEE and NEMA standards
- UL or C-UL Listing available
- Available as factory insulated for internal buss.

Engineer Recommendations / Comments:

- Future Replacement Should Include Two Tie Breakers with Generator Power Connection in Mid- Section.

Figure B1
Non-Arc Flash Resistant 5 KV Switchgear

5 kV Arc Flash Resistant Switchgear
State of the Art Features:

- The switchgear includes the same features and basic benefits of non-arc flash resistant switchgear.
- Additionally, Arc Resistant Switchgear provides addi¬tional protection in the event of an internal arcing fault. Aarc resistant switchgear meets or exceeds ANSI/IEEE C37.20.2 as they apply to metal-clad switchgear and IEEE Guide C37.20.7 for arc resis¬tant rating type 2B.The assemblies also conform to CSA C22.2 No.31.Type VCP-W vacuum circuit breakers meet or exceed all ANSI and IEEE standards applicable to AC high voltage circuit breakers rated on a symmetrical current basis.
- A switchgear assembly contains insulating materials, protective and control devices, electrical contacts, and operating mechanisms, which must be protected against dirt, moisture, cement dust, foreign materials, corrosive atmospheres, and extreme temperature change.

Engineer Recommendations / Comments:

- Future Replacement Should Include Two Main Circuit Breakers and Two Tie Breakers with Generator Power Connection in in Mid- Section.

Figure B2
Optional Arc Flash Resistant 5 kV Switchgear

Generator Master Control Panel, State of the Art Features

- Includes Manual and Automatic Control features.
- PLC for Automatic Control Logic
- Metering Interconnected with SCADA Power Management.

Engineer Recommendations / Comments:

- Specify PLC brand consistent with SCADA products at the plant.

Generator Low Voltage Control Panels, State of the Art Features:

- Each Generator has a Dedicated Control Panel.
- Low Voltage Controls are Separate from 5 KV Equipment.

Engineer Recommendation:

- Low Voltage Controls for Generators shall not be Combined with 5 kV Cabinet

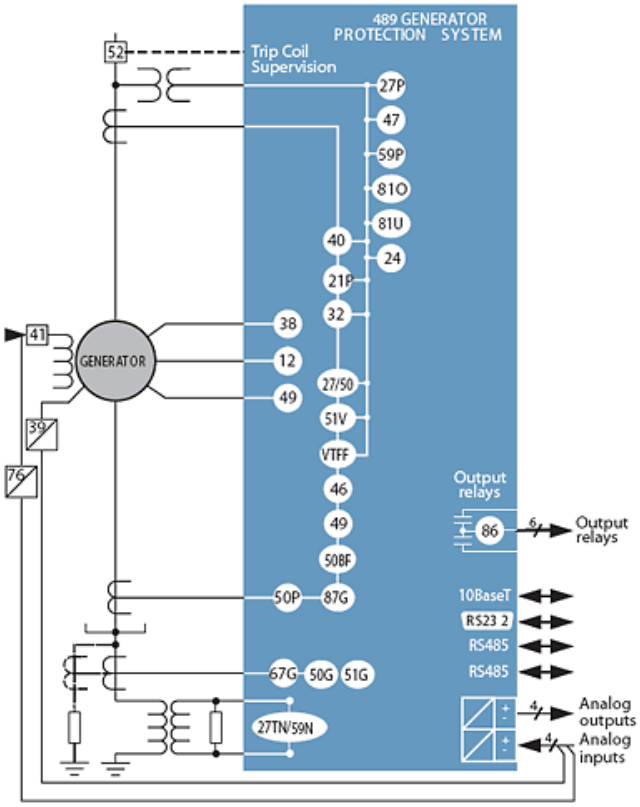
Figure B3
Generator Control Panels

State of the Art Features

- Generator stator differential
- 100% stator ground
- Loss of excitation
- Distance backup
- Reverse power (anti-motoring)
- Overexcitation
- Ground directional overcurrent
- Inadvertent energization
- Breaker failure
- Stator and bearing thermal monitoring
- Stator and bearing vibra. monitoring
- Negative sequence overcurrent

Engineer Recommendations / Comments:

- Specify Electronic Protective for Each Generators



12	Overspeed protection
21P	Phase distance
24	Volts/Hz
27P	Phase undervoltage
27/50	Accidental generator energization
27TN/59N	100% stator earth fault
32	Directional power
38	Bearing overtemperature (RTD)
39	Bearing vibration
40	Loss of excitation
46	Stator current unbalance
47	Phase reversal
49	Thermal overload
50BF	Breaker failure
50P	Phase instantaneous overcurrent
50G	Ground instantaneous overcurrent
51P	Phase time overcurrent
51G	Ground time overcurrent
51_2	Negative Sequence Time Overcurrent
51V	Voltage restrained time overcurrent
59P	Phase overvoltage
67G	Ground directional overcurrent
81O	Overfrequency
81U	Underfrequency
86	Lockout
87G	Generator differential
VTFF	VT fuse failure

Figure B4
Generator Protection System

480V Switchgear State of the Art Features:

- Manufactured per ANSI C.37.20 standard and UL 1558 Standard.
- Each Switchgear consist of Two Main Circuit Breakers and two Tie Circuit Breakers.
- Feeder Breakers Supply Power to Remote MCCs

Engineer Recommendations / Comments:

- Consider Specifying 480 Volts Switchgear and not Switchboards.

Figure B5
480V Switchgear

5 KV Switchgear State of the Art Features:

- Manufactured per ANSI C.37.20
- Optional Arc Flash Resistant with Arc Plenum
- Switchgear consist of Two Main 5 KV Breakers and two Tie Circuit Breakers.
- Breakers for Two Generators would be located in center section between Tie Breakers.
- Feeder Breakers Supply Power to Remote 5 KV/480V Transformers
- Consider locating low voltage controls in separate cabinet.

Engineer Recommendations / Comments:

- Consider Specifying 5 KV Switchgear Rated for Arc Resistant.
- Sample Switchgear layout may be used as guideline for lengthening existing electrical room into previous space of FPL vault
- Ample Front Gear Clearances for maneuvering heavy equipment parts.
- Room with Air Conditioning
- 5 KV Electrical room shall have no Low Voltage MCCs

Figure B6
Sample 5 KV Switchgear Layout

LOCAL BUSINESS EXHIBIT "A"
CITY OF POMPANO BEACH, FLORIDA
LOCAL BUSINESS PARTICIPATION FORM

Solicitation Number & Title: E-04-20, Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System Prime Contractor's Name: Carollo Engineers, Inc.

Name of Firm, Address	Contact Person, Telephone Number	Type of Work to be Performed/Material to be Purchased	Contract Amount or %
DK Architects	954-941-3329	Architecture, Site Plan, Permitting	TBD*
61 NE 1st St., Suite 2, Pompano Beach, FL 33060			
Compass Point Surveyors, PL	954-332-8181	Surveying	TBD*
3195 N. Powerline Rd #112, Pompano Beach, FL 33069			
Quest Engineering Services & Testing, Inc.	954-582-9800	Geotechnical	TBD*
2737 NW 19th St., Pompano Beach, FL 33069			

LOCAL BUSINESS EXHIBIT "A"

*Carollo is committed to meeting the required goal of 10% local business participation. The actual breakdown will be determined in the future.

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

New building facility design and site planning, permitting, LEED certification, and construction administration.

at the following price: T.B.D.

02-11-2020
(Date)

Design Kollaborative Architects/Planners,
(Print Name of Local Business Contractor)
61 NE 1st Street, Suite 2
(Street Address)
Pompano Beach, FL 33060
(City, State, Zip Code)
BY: _____
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

Surveying Services

at the following price: TBD

02-17-2020
(Date)

Compass Point Surveyors, PL
(Print Name of Local Business Contractor)
3195 N. Powerline Road #112
(Street Address)
Pompano Beach, Fl 33069
(City, State Zip Code)

BY: _____
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

LOCAL BUSINESS EXHIBIT "B"
LOCAL BUSINESS
LETTER OF INTENT TO PERFORM AS A LOCAL SUBCONTRACTOR

Solicitation Number E-04-20

TO: Carollo Engineers, Inc.
(Name of Prime or General Bidder)

The undersigned City of Pompano Beach business intends to perform subcontracting work in connection with the above contract as (check below)

☐ an individual ☑ a corporation

_____ a partnership _____ a joint venture

The undersigned is prepared to perform the following work in connection with the above Contract, as hereafter described in detail:

Geotechnical Engineering, Construction Materials Testing and Special (Structural) Inspection Services

at the following price: _____

February 4, 2020
(Date)

Quest Engineering Services & Testing, In
(Print Name of Local Business Contractor)
2737 NW 19 Street
(Street Address)
Pompano Beach, FL - 33069
(City, State Zip Code)
BY: K. N. Sailappan
(Signature)

IMPORTANT NOTE: Signatures on this form MUST be by an authorized employee of Subcontractor and must be uploaded to the Response Attachment Tab

LOCAL BUSINESS EXHIBIT "B"

N/A

LOCAL BUSINESS EXHIBIT "C

LOCAL BUSINESS
UNAVAILABILITY FORM

BID # E-04-20

I,_____
(Name and Title)

of_____, certify that on the _____day of

_____, _____, I invited the following LOCAL BUSINESSES to bid work items to be performed in the City of Pompano Beach:

Business Name, Address	Work Items Sought	Form of Bid Sought (i.e., Unit Price, Materials/Labor, Labor Only, etc.)

Said Local Businesses:

☐ Did not bid in response to the invitation

☐ Submitted a bid which was not the low responsible bid

☐ Other:_____

Name and Title: _____

Date: _____

Note: Attach additional documents as available.

LOCAL BUSINESS EXHIBIT "D"
GOOD FAITH EFFORT REPORT
LOCAL BUSINESS PARTICIPATION

BID # E-04-20

1. What portions of the contract have you identified as Local Business opportunities?

Architecture, Site Plan, Permitting

Surveying

Geotechnical

2. Did you provide adequate information to identified Local Businesses? Please comment on how you provided this information.

Yes

3. Did you send written notices to Local Businesses?

☐ Yes ☑ No

If yes, please include copy of the notice and the list of individuals who were forwarded copies of the notices.

4. Did you advertise in local publications?

☐ Yes ☑ No

If yes, please attach copies of the ads, including name and dates of publication.

5. What type of efforts did you make to assist Local Businesses in contracting with you ?

Emails and phone calls

7. List the Local Businesses you will utilize and subcontract amount.

DK Architects	$TBD*
Compass Point Surveyors, PL	$TBD*
Quest Engineering Services & Testing, Inc.	$TBD*

*Carollo is committed to meeting the required goal of 10% local business participation. The actual breakdown will be determined in the future.

8. Other comments: _____

LOCAL BUSINESS EXHIBIT “D” – Page 2

_____

_____

_____

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

115 S. Andrews Ave., Rm. A-100, Ft. Lauderdale, FL 33301-1895 – 954-831-4000

VALID OCTOBER 1, 2019 THROUGH SEPTEMBER 30, 2020

DBA:
Business Name: D K ARCHITECTS PLANNERS INC

Receipt #: 315-291
Business Type: ENGINEER (CORP ARCHITECT/PLANNERS)

Owner Name: D K ARCHITECTS PLANNERS INC
Business Location: 24 NE 24 AVE
POMPANO BEACH

Business Opened: 12/17/1998
State/County/Cert/Reg: AR-6329
Exemption Code:

Business Phone:

Rooms	Seats	Employees	Machines	Professionals
		5		

For Vending Business Only

Number of Machines: **Vending Type:**

Tax Amount	Transfer Fee	NSF Fee	Penalty	Prior Years	Collection Cost	Total Paid
30.00	0.00	0.00	0.00	0.00	0.00	30.00

THIS RECEIPT MUST BE POSTED CONSPICUOUSLY IN YOUR PLACE OF BUSINESS

THIS BECOMES A TAX RECEIPT

WHEN VALIDATED

This tax is levied for the privilege of doing business within Broward County and is non-regulatory in nature. You must meet all County and/or Municipality planning and zoning requirements. This Business Tax Receipt must be transferred when the business is sold, business name has changed or you have moved the business location. This receipt does not indicate that the business is legal or that it is in compliance with State or local laws and regulations.

Mailing Address:

D K ARCHITECTS PLANNERS INC
24 NE 24 AVE
POMPANO BEACH, FL 33062

Receipt #1CP-18-00009097
Paid 07/12/2019 30.00
07/11/2019 Effective Date

2019 - 2020

BROWARD COUNTY LOCAL BUSINESS TAX RECEIPT

pompano beach
Florida's Warmest Welcome

CITY OF POMPANO BEACH
BUSINESS TAX RECEIPT
FISCAL YEAR: 2019 - 2020

Business Tax Receipt Valid from: October 1, 2019 through September 30, 2020

4459900 9/18/2019
COMPASS POINT SURVEYORS PL
3195 N POWERLINE RD #112

POMPANO BEACH FL 33069

THIS IS NOT A BILL

THIS IS YOUR BUSINESS TAX RECEIPT. PLEASE POST IN A CONSPICUOUS PLACE AT THE BUSINESS LOCATION.

BUSINESS OWNER: COMPASS POINT SURVEYORS PL
BUSINESS LOCATION: 3195 N POWERLINE RD 112 POMPANO BEACH FL

RECEIPT NO:	**CLASSIFICATION**
20-00087031	**PROFESSIONAL OFFICE (SEE REQUIREMENTS)**

NOTICE: A NEW APPLICATON MUST BE FILED IF THE BUSINESS NAME, OWNERSHIP OR ADDRESS IS CHANGED. THE ISSUANCE OF A BUSINESS TAX RECEIPT SHALL NOT BE DEEMED A WAIVER OF ANY PROVISION OF THE CITY CODE NOR SHALL THE ISSUANCE OF A BUSINESS TAX RECEIPT BE CONSTRUED TO BE A JUDGEMENT OF THE CITY AS TO THE COMPETENCE OF THE APPLICANT TO TRANSACT BUSINESS. **THIS DOCUMENT CANNOT BE ALTERED**.

BUSINESS TAX RECEIPTS EXPIRE SEPTEMBER 30TH OF EACH YEAR

pompano beach
Florida's Warmest Welcome

CITY OF POMPANO BEACH
BUSINESS TAX RECEIPT
FISCAL YEAR: 2019 - 2020

Business Tax Receipt Valid from: October 1, 2019 through September 30, 2020

4441289 9/24/2019
QUEST ENGINEERING SERVICES
& TESTING INC
2737 NW 19 ST
POMPANO BEACH FL 33069

THIS IS NOT A BILL

THIS IS YOUR BUSINESS TAX RECEIPT. PLEASE POST IN A CONSPICUOUS PLACE AT THE BUSINESS LOCATION.

BUSINESS OWNER: QUEST ENGINEERING SERVICES &
BUSINESS LOCATION: 2737 NW 19 ST POMPANO BEACH FL

RECEIPT NO:	**CLASSIFICATION**
20-00065333	**PROFESSIONAL OFFICE (SEE REQUIREMENTS)**

NOTICE: A NEW APPLICATON MUST BE FILED IF THE BUSINESS NAME, OWNERSHIP OR ADDRESS IS CHANGED. THE ISSUANCE OF A BUSINESS TAX RECEIPT SHALL NOT BE DEEMED A WAIVER OF ANY PROVISION OF THE CITY CODE NOR SHALL THE ISSUANCE OF A BUSINESS TAX RECEIPT BE CONSTRUED TO BE A JUDGEMENT OF THE CITY AS TO THE COMPETENCE OF THE APPLICANT TO TRANSACT BUSINESS. **THIS DOCUMENT CANNOT BE ALTERED**.

BUSINESS TAX RECEIPTS EXPIRE SEPTEMBER 30TH OF EACH YEAR

TIER 1/TIER 2 COMPLIANCE FORM

IN ORDER FOR YOUR FIRM TO COMPLY WITH THE CITY'S LOCAL BUSINESS PROGRAM AS A TIER 1 OR TIER 2 VENDOR, BIDDERS MUST COMPLETE THE INFORMATION BELOW AND UPLOAD THE FORM TO THE RESPONSE ATTACHMENTS TAB IN THE EBID SYSTEM.

TIER 1 LOCAL VENDOR

_____ My firm has maintained a permanent place of business within the city limits and maintains a staffing level, within this local office, of at least 10 % who are residents of the City of Pompano Beach.

And/Or

_____ My firm has maintained a permanent place of business within the city limits and my submittal includes subcontracting commitments to Local Vendors Subcontractors for at least 10 % of the contract value.

Or

☑ My firm does not qualify as a Tier 1 Vendor.

TIER 2 LOCAL VENDOR

_____ My firm has maintained a permanent place of business within Broward County and maintains a staffing level, within this local office, of at least 15% who are residents of the City of Pompano Beach

And/Or

_____ My firm has maintained a permanent place of business within Broward County and my submittal includes subcontracting commitments to Local Vendors Subcontractors for at least 20% of the contract value.

Or

☑ My firm does not qualify as a Tier 2 Vendor.

I certify that the above information is true to the best of my knowledge.

February 13, 2020
(Date)

Carollo Engineers, Inc.
(Name of Firm)

BY: Elizabeth Fujikawa, PE, LEED AP, BCEE
(Name)

Florida's Warmest Welcome

CITY OF POMPANO BEACH
REQUEST FOR QUALIFICATIONS
E-04-20

Master Plan Update, Design, and Consulting Services for Water Treatment Plant 5 kV Electrical System

OPENING: February 13, 2020 2:00 P.M.
PURCHASING OFFICE
1190 N.E. 3RD AVENUE, BUILDING C (Front)
POMPANO BEACH, FLORIDA 33060

January 14, 2020

CITY OF POMPANO BEACH, FLORIDA

REQUEST FOR QUALIFICATIONS
E-04-20

Master Plan Update, Design, and Consulting Services for
Water Treatment Plant 5 kV Electrical System

Pursuant to Florida Statutes Chapter 287.055 "Consultants' Competitive Negotiation Act" the City of Pompano Beach invites professional firms to submit qualifications and experience for consideration to provide professional design and consulting engineering services, including: advanced water treatment systems, electrical system master planning, bid specifications, permitting services, bidding assistance, construction services and certifications to the City for the project listed below:

Project: Master Plan Update, Design, and Consulting Services for:
Water Treatment Plant 5 kV Electrical System

The City will receive sealed proposals until **2:00 p.m. (local), February 13, 2020**. Proposals must be submitted electronically through the eBid System on or before the due date/time stated above. Any proposal received after the due date and time specified, will not be considered. Any uncertainty regarding the time a proposal is received will be resolved against the Proposer.

Proposer must be registered on the City's eBid System in order to view the solicitation documents and respond to this solicitation. The complete solicitation document can be downloaded for free from the eBid System as a pdf at: https://pompanobeachfl.ionwave.net/CurrentSourcingEvents.aspx. The City is not responsible for the accuracy or completeness of any documentation the Proposer receives from any source other than from the eBid System. Proposer is solely responsible for downloading all required documents. A list of proposers will be read aloud in a public forum.

Project Narrative

The City of Pompano Beach is requesting qualifications to provide professional design and consulting engineering services, including: advanced water treatment systems, electrical system master planning, bid specifications, permitting services, bidding assistance, construction services and certifications. Assistance with a State Revolving Fund (SRF) funding application will be required, this funding will be utilized to update and or replace the existing power distribution system at the Pompano Beach Water Treatment Plant (WTP).

The master planning work will require the assessment of numerous pieces of obsolete and deteriorating pieces of electrical equipment that requires replacement, further assessment of options for reducing quantities of equipment by combining equipment function while maintaining reliability for power distribution and standby power generation, and development of alternatives for master planning the upgrades. The recommendations will be used as a basis for capital budget projections and scoping of work to design and construct the vital improvements in separate construction phases.

The selected firm is to provide design, bid specifications and contract documents, bid assistance including RFI response, bid review and award recommendation, and construction administration services, all related to the following:

- Coordination with FPL for relocation of existing 13 kV / 5 kV service transformers.
- Design building modifications to accommodate new service 5 kV switchgear.
- Design of new double ended 5 kV main service switchgear.
- Design of new 5 kV switchgear and controls for paralleling standby power generators.
- Design of new 5 kV variable frequency drives for speed control of high service pumps.
- Design of a new building to accommodate new 480 volts power distribution switchgear.
- Design electrical improvements to replace various 480 volts motor control centers.
- Design of electrical underground infrastructure to replace underground duct banks and cables.
- Experience with design of buildings and building systems and the retrofit of buildings and building systems in accordance with the City of Pompano Beach, Broward County, and the State of Florida as it relates to building codes, building permits, stormwater permitting, and LEED certification.
- Proven technical, cost management, scheduling, and quality control capabilities.
- The following documents are available for review. (Attached):
    - City of Pompano Beach Lime Softening Water Treatment Plant TECHNICAL MEMORANDUM No. 1 EVALUATION OF 5 kV ELECTRICAL SYSTEM FOR MASTER PLANNING UPGRADES FINAL July 2012

A. Scope of Services

The City intends to issue a single contract to an engineering firm to provide professional consulting services to the City for the project described herein and listed above:

The Scope of Services may include, but is not limited, to the following:

- Planning, design, construction management services, and implementation of advanced water treatment systems. Prepare preliminary design, schematics, drawings, project schedules, feasibility analyses, site plans and/or design alternative recommendations and preliminary cost estimates. Identify any design of construction restrictions.

- Identify any tests (land & water) that may be necessary to carry out a sound design including soils, concrete strength, permeability/percolation, density, pot-holing, etc.

- Prepare cost estimates to confirm initial budget allocations and/or to seek City's advice before proceeding with final designs. The firm will be responsible for cost controls throughout the design and construction project except for design and construction elements added or deleted by an expressed City directive.

- Conduct presentations to elected officials, advisory boards, staff, and the public.

- Prepare all required bidding and construction documents for the project. This will include preparing all required surveys (land and water), design plans, supplementary contract requirements, technical specifications, cost estimates, responses to requests for Information (RFIs) and product submittal reviews. The firm(s) will be expected to provide Construction

Administration services and certify the project with all pertinent governing agencies (City, County, State, etc.).

- Prepare plans for review and approval by Development Review Committee (DRC); Planning and Zoning (P&Z); Architectural Appearance Committee (AAC); City's Building Department; Broward County Traffic Engineering; Broward County Water Resources; Florida Department of Health (HRS); Florida Department of Environmental Protection (FDEP); Florida Department of Transportation (FDOT); U. S. Army Corps of Engineers (USACE); U.S. Coast Guard; and/or, any other government agency or City Department having jurisdiction or requiring plan review and approval.

- Attendance at City Commission, Advisory Committee meetings, pre-design, design, bidding and bid award meetings will be required.

- Firms and/or any sub-consultants must have previous experience in infrastructure projects, and must be licensed to practice Professional Engineering, Architecture, Landscape Architecture, Electrical Engineering, and Irrigation in the State of Florida.

- Compliance with all state and local codes, laws and ordinances, including but not limited to the CITY, OSHA, Federal and State ADA Standards for Accessible Design, Broward County Building Department, and the latest edition of the Florida Building Code, including the latest amendments to these codes is mandatory. Incorporation of the CITY's security and information technology requirements may be required.

B. Selection/Evaluation Process

A Selection/Evaluation Committee will be appointed to select the most qualified firm(s). The Selection/Evaluation Committee will present their findings to the City Commission.

Proposals will be evaluated using the following criteria.

	Criteria	Point Range
1	Prior experience of the firm with projects of similar size and complexity: a. Number of similar projects • Roll of the firm, Prime or subconsultant • Engineering Disciplines performed by firm • Design fee and construction cost of project b. Complexity of similar projects c. References from past projects performed by the firm d. Previous projects performed for the City • Roll of the firm, Prime or subconsultant • Engineering Disciplines performed by firm • Design fee and construction cost of project e. Litigation within the past 5 years arising out of firm's performance	0-20

2	Qualifications of personnel including sub consultants: a. Organizational chart for project b. Number of technical staff c. Qualifications of technical staff: (1) Number of licensed staff (2) Education of staff (3) Experience of staff on similar projects	0-20
3	Proximity of the nearest office to the project location: a. Location b. Number of staff at the nearest office	0-5
4	Technical approach to perform the tasks described in the Scope of Services: a. Level of effort b. Effectiveness of the technical approach to complete each phase of the project, maintain time schedules and cost control	0-20
5	Is the firm a certified minority business enterprise as defined by the Florida Small and Minority Business Assistance Act of 1985? (include sub-consultants)	0-5
6	**Current and Projected Workload** - Provide the workload (both current and projected backlog) and percentage of available time of the firm and the staff members assigned in organizational chart. Respondents which fail to note both existing and projected workload conditions and percentage of availability of staff assigned shall receive zero (0) points.	0-10
7	**Is the Demonstrated Prior Ability to Complete Project on Time:** Respondents are asked to provide a tentative project schedule for the project described in this solicitation. Respondents shall be evaluated on the tasks identified, the interrelationships between project tasks, and the estimated durations for each task. Specific attention will be given to any critical issues identified, which may include: permitting (list agency and duration), temporary easements, temporary traffic control and the City required tree assessment. Respondents will be evaluated on information provided regarding the firm's past experience in the successful completion and steadfast conformance to similar project schedules. Provide an example of successful approaches utilized to achieve a timely project completion.	0-20

Demonstrated Prior Ability to Complete Project on Budget: Proposers will be evaluated on their ability to adhere to initial design budgets. Examples provided should show a comparison between initial negotiated task costs and final completion costs. Respondents should explain in detail any budgetary overruns due to scope modifications. Respondents which fail to provide schedule and budget information as requested will receive zero (0) points.	
Additional 0-5% for Tier1/Tier2 Local Business will be calculated on combined scoring totals of each company.	**0-100**

Value of Work Previously Awarded to Firm (Tie-breaker) - In the event of a tie, the firm with the lowest value of work as a prime contractor on City of Pompano Beach projects within the last five years will receive the higher ranking, the firm with the next lowest value of work shall receive the next highest ranking, and so on. The analysis of past work will be based on the City's Purchase Order and payment records.

The Committee has the option to use the above criteria for the initial ranking to short-list Proposers and to use an ordinal ranking system to score short-listed Proposers following presentations (if deemed necessary) with a score of "1" assigned to the short-listed Proposer deemed most qualified by the Committee.

Each firm should submit documentation that evidences the firm's capability to provide the services required for the Committee's review for short listing purposes. After an initial review of the Proposals, the City may invite Proposers for an interview to discuss the proposal and meet firm representatives, particularly key personnel who would be assigned to the project. Should interviews be deemed necessary, it is understood that the City shall incur no costs as a result of this interview, nor bear any obligation in further consideration of the submittal.

When more than three responses are received, the committee shall furnish the City Commission (for their approval) a listing, in ranked order, of no fewer than three firms deemed to be the most highly qualified to perform the service. If three or less firms respond to the Solicitation, the list will contain the ranking of all responses.

The City Commission has the authority to (including, but not limited to); approve the recommendation; reject the recommendation and direct staff to re-advertise the solicitation; or, review the responses themselves and/or request oral presentations and determine a ranking order that may be the same or different from what was originally presented to the City Commission.

C. Local Business Program

On March 13, 2018, the City Commission approved Ordinance 2018-46, establishing a Local Business Program, a policy to increase the participation of City of Pompano Beach businesses in the City's procurement process.

For purposes of this solicitation, "Local Business" will be defined as follows:

1. **TIER 1 LOCAL VENDOR.** POMPANO BEACH BUSINESS EMPLOYING POMPANO BEACH RESIDENTS. A business entity which has maintained

a permanent place of business within the city limits and maintains a staffing level, within this local office, of at least ten percent who are residents of the City of Pompano Beach or includes subcontracting commitments to Local Vendors Subcontractors for at least ten percent of the contract value. The permanent place of business may not be a post office box. The business must be located in a non-residential zone, and must actually distribute goods or services from that location. The business must be staffed with full-time employees within the limits of the city. In addition, the business must have a current business tax receipt from the City of Pompano Beach for a minimum of one year prior to the date of issuance of a bid or proposal solicitation.

2. **TIER 2 LOCAL VENDOR.** BROWARD COUNTY BUSINESS EMPLOYING POMPANO BEACH RESIDENTS OR UTILIZING LOCAL VENDOR SUBCONTRACTORS. A business entity which has maintained a permanent place of business within Broward County and maintains a staffing level, within this local office, of at least 15% who are residents of the City of Pompano Beach or includes subcontracting commitments to Local Vendors Subcontractors for at least 20% of the contract value. The permanent place of business may not be a post office box. The business must be located in a non- residential zone, and must actually distribute goods or services from that location. The business must be staffed with full-time employees within the limits of the city. In addition, the business must have a current business tax receipt from the respective Broward County municipality for a minimum of one year prior to the date of issuance of a bid or proposal solicitation.

3. **LOCAL VENDOR SUBCONTRACTOR.** POMPANO BEACH BUSINESS. A business entity which has maintained a permanent place of business within the city limits of the City of Pompano Beach. The permanent place of business may not be a post office box. The business must be located in a non-residential zone, and must actually distribute goods or services from that location. The business must be staffed with full-time employees within the limits of the city. In addition, the business must have a current business tax receipt from the City of Pompano Beach for a minimum of one year prior to the date of issuance of a bid or proposal solicitation.

   You can view the list of City businesses that have a current Business Tax Receipt on the City's website, and locate local firms that are available to perform the work required by the bid specifications. The business information, sorted by business use classification, is posted on the webpage for the Business Tax Receipt Division: www.pompanobeachfl.gov by selecting the Pompano Beach Business Directory in the Shop Pompano! section.

   The City of Pompano Beach is **strongly committed** to insuring the participation of City of Pompano Beach Businesses as contractors and subcontractors for the procurement of goods and services, including

labor, materials and equipment. Proposers are required to participate in the City of Pompano Beach's Local Business Program by including, as part of their package, the Local Business Participation Form (Exhibit A,) listing the local businesses that will be used on the contract, and the Letter of Intent Form (Exhibit B) from each local business that will participate in the contract.

The required goal for this Solicitation is 10% for Local Vendor.

If a Prime Contractor/Vendor is not able to achieve the level of goal attainment of the contract, the Prime Vendor will be requested to demonstrate and document that good faith efforts were made to achieve the goal by providing the Local Business Unavailability Form (Exhibit C), listing firms that were contacted but not available, and the Good Faith Effort Report (Exhibit D), describing the efforts made to include local business participation in the contract. This documentation shall be provided to the City Commission for acceptance.

The awarded proposer will be required to submit “Local Business Subcontractor Utilization Reports” during projects and after projects have been completed. The reports will be submitted to the assigned City project manager of the project. The Local Business Subcontractor Utilization Report template and instructions have been included in the bid document.

Failure to meet Local Vendor Goal commitments will result in “unsatisfactory” compliance rating. Unsatisfactory ratings may impact award of future projects if a sanction is imposed by the City Commission.

The city shall award a Local Vendor preference based upon vendors, contractors, or subcontractors who are local with a preferences follows:

1. For evaluation purposes, the Tier 1 and Tier 2 businesses shall be a criterion for award in this Solicitation. No business may qualify for more than one tier level.

2. For evaluation purposes, local vendors shall receive the following preferences:

   a. Tier 1 business as defined by this subsection shall be granted a preference in the amount of five percent of total score.

   b. Tier 2 business as defined by this subsection shall be granted a preference in the amount of two and one-half percent of total score.

3. It is the responsibility of the awarded vendor/contractor to comply with all Tier 1 and Tier 2 guidelines. The awarded vendor/contractor must ensure that all requirements are met before execution of a contract.

D. <u>Required Proposal Submittal</u>

Sealed proposals shall be submitted electronically through the eBid System on or before the due date/time stated above. Proposer shall upload response as one (1) file to the eBid System. The file size for uploads is limited to 100 MB. If the file size exceeds 100 MB the response must be split and uploaded as two (2) separate files.

Information to be included in the proposal: In order to maintain comparability and expedite the review process, it is required that proposals be organized in the manner specified below, with the sections clearly labeled:

Title page:
Show the project name and number, the name of the Proposer's firm, address, telephone number, name of contact person and the date.

Table of Contents:
Include a clear identification of the material by section and by page.

Letter of Interest:
A Letter of Interest, signed by an authorized representative of your firm, expressing your understanding of the project and expressing a positive commitment to provide the services described herein. In the letter, include:

- complete corporate name of the primary firm responding
- applicable Federal Tax Identification Number
- address
- telephone and fax numbers
- name, title, and email of the person to contact regarding your submission

Please limit this section to two pages.

Technical Approach:
Firms or teams shall submit their technical approach to the tasks described in the scope, including details of how each phase of the project would be completed, and how their firm proposes to maintain time schedules and cost controls.

Schedule:
Project Baseline Schedule (Design Phase)
The Consultant will create a detailed project baseline schedule using a Critical Path Method (CPM) approved by the City, demonstrating how the Consultant will meet the target date for completion of the Design Phase. The City currently uses Microsoft Project 2019 for this purpose. The Consultant will define major and/or critical project activities, including sufficient time for City, regulatory and permitting review. The Consultant will maintain the project schedule on a monthly basis. The monthly progress report and the updated project schedule will be submitted with the project invoice as part of the monthly request for payment.

At a minimum, the schedule will indicate the following:

- Project start date and finish date for each activity
- Each project task and subtask in the WBS with established relationships
- Milestones for each task
    - NTP, Meeting & Workshop Dates, Geotechnical, Survey, Utility Coordination, 30/60/90/100%, Specifications, Cost Estimate, Permit Review, City Review, Bid Package Signed & Sealed.
- Project submittal dates
- Submittal dates for each deliverable

• Physical percent complete for each activity in the WBS and percent complete by Phase

Project Team Form:
Submit a completed "Project Team" form. The purpose of this form is to identify the key members of your team, including any specialty subconsultants.

Organizational Chart:
Specifically identify the management plan (if needed) and provide an organizational chart for the team. The proposer must describe at a minimum, the basic approach to these projects, to include reporting hierarchy of staff and sub-consultants, clarify the individual(s) responsible for the co-ordination of separate components of the scope of services.

Statement of Skills and Experience of Project Team:
Describe the experience of the entire project team as it relates to the type of project described in the Narrative section of this RFQ. Include the experience of the prime consultants as well as other members of the project team; i.e., additional personnel, sub-consultants, branch office, team members, and other resources anticipated to be utilized for this project.

Name and Describe five (5) projects successfully completed by the firm within the past five (5) years that involved electrical engineering services for a water treatment facility. For each project, identify the project name, location, size, and completion date. Describe the nature of each project. Provide at least one reference for each project, including a contact name and telephone number.

Resumes of Key Personnel
Include resumes for key personnel for prime and subconsultants.

Respondent must provide at least one (1) LEED accredited professional on staff or as a consultant.

Submit the resume of the proposed lead electrical engineer for electrical design services. The lead electrical engineer shall be a registered Professional Engineer in the State of Florida and should act as the Engineer of Record for the electrical design. The lead electrical engineer shall have a minimum of 20 years of design experience for projects in South Florida. The lead electrical engineer shall report to an office located in Broward County. The office location shall be clearly identified.

The lead electrical engineer should have experience developing and implementing an Electrical Master Plan. Submit a copy of a reference Electrical Master Plan or sufficient information to confirm the lead electrical engineer meets this qualification.

References:
References for past (3) similar projects in size and scope in the State of Florida. Describe the scope of each project in physical terms and by cost, describe the respondent's responsibilities, and provide the contact information (name, email, telephone number) of an individual in a position of responsibility who can attest to respondent's activities in relation to the project.

List any prior projects performed for the City of Pompano Beach.

Office Locations:
Identify the location of the office from which services will be rendered, and the number of professional and administrative staff at the prime office location. Also identify the location of office(s) of the prime and/or sub consultants that may be utilized to support any or all of the

professional services listed above and the number of professional and administrative staff at the prime office location.

If firms are situated outside the local area, (Broward, Palm Beach, and Miami-Dade counties) include a brief statement as to whether or not the firm will arrange for a local office during the term of the contract, if necessary.

Local Businesses:
Completed Local Business program forms, Exhibits A-D.

Minority Business Enterprises:
It is the intent of the City of Pompano Beach to encourage minority and women owned firms to participate in the process. The methods by which this is accomplished should be developed and presented by the respondents in their submissions.

For any member of your team that is a certified Minority Business Enterprise (as defined by the State of Florida) you must include copies of their certifications for them to be considered toward Item 5 in the evaluation criteria. Complete Exhibit I and include all certificates in your electronic submittal.

Litigation:
Disclose any litigation within the past five (5) years arising out your firm's performance, including status/outcome.

City Forms:
Responses should include all City forms as stated above. Required forms must be completed and submitted electronically through the City's eBid System.

E. Reviewed and Audited Financial Statements:

Proposers shall be financially solvent and appropriately capitalized to be able to service the City for the duration of the contract. Proposers shall provide a complete financial statement of the firm's most recent audited financial statements, indicating organization's financial condition. Must be uploaded to the Response Attachments tab in the eBid System as a separate file titled "Financial Statements" and marked "CONFIDENTIAL."

Financial statements provided shall not be older than twelve 12) months prior to the date of filing this solicitation response. The financial statements are to be reviewed and submitted with any accompanying notes and supplemental information. The City of Pompano Beach reserve the right to reject financial statements in which the financial condition shown is of a date twelve (12) months or more prior to the date of submittals.

The City is a public agency subject to Chapter 119, Florida's Public Records Law and is required to provide the public with access to public records, however, financial statements that are required as submittals to prequalify for a solicitation will be exempt from public disclosure.

The City reserves the right to request additional information to ensure the proposer is financially solvent and has sufficient financial resources to perform the contract and shall provide proof thereof of its financial solvency. The City may as at its sole discretion ask for additional proof of financial solvency, including additional documents post proposal opening, and prior to evaluation that demonstrates the Proposer's ability to perform the resulting contract and provide the required materials and/or services.

A combination of two (2) or more of the following may substitute for audited financial statements:

1) Bank letters/statements for the past 3 months
2) Balance sheet, profit and loss statement, cash flow report
3) IRS returns for the last 2 years
4) Letter from CPA showing profits and loss statements (certified)

F. Insurance Requirements

PROPOSER shall not commence services under the terms of this Agreement until certification or proof of insurance detailing terms and provisions has been received and approved in writing by the CITY's Risk Manager. If you are responding to a bid and have questions regarding the insurance requirements hereunder, please contact the City's Purchasing Department at (954) 786-4098. If the contract has already been awarded, please direct any queries and proof of the requisite insurance coverage to City staff responsible for oversight of the subject project/contract.

PROPOSER is responsible to deliver to the CITY for timely review and written approval/disapproval Certificates of Insurance which evidence that all insurance required hereunder is in full force and effect and which name on a primary basis, the CITY as an additional insured on all such coverage. **Such policy or policies shall be issued by United States Treasury approved companies authorized to do business in the State of Florida. The policies shall be written on forms acceptable to the City's Risk Manager, meet a minimum financial A.M. Best and Company rating of no less than Excellent, and be part of the Florida Insurance Guarantee Association Act. No changes are to be made to these specifications without prior written approval of the City's Risk Manager.**

Throughout the term of this Agreement, CITY, by and through its Risk Manager, reserve the right to review, modify, reject or accept any insurance policies required by this Agreement, including limits, coverages or endorsements. CITY reserves the right, but not the obligation, to review and reject any insurer providing coverage because of poor financial condition or failure to operate legally.

Failure to maintain the required insurance shall be considered an event of default. The requirements herein, as well as CITY's review or acceptance of insurance maintained by PROPOSER, are not intended to and shall not in any way limit or qualify the liabilities and obligations assumed by PROPOSER under this Agreement.

Throughout the term of this Agreement, PROPOSER and all subcontractors or other agents hereunder, shall, at their sole expense, maintain in full force and effect, the following insurance coverages and limits described herein, including endorsements.

A. Worker's Compensation Insurance covering all employees and providing benefits as required by Florida Statute, Chapter 440, regardless of the size of the company (number of employees) or the state in which the work is to be performed or of the state in which PROPOSER is obligated to pay compensation to employees engaged in the performance of the work. PROPOSER further agrees to be responsible for employment,

control and conduct of its employees and for any injury sustained by such employees in the course of their employment.

B. Liability Insurance.

(1) Naming the City of Pompano Beach as an additional insured as City's interests may appear, on General Liability Insurance only, relative to claims which arise from PROPOSER's negligent acts or omissions in connection with PROPOSER's performance under this Agreement.

(2) Such Liability insurance shall include the following checked types of insurance and indicated minimum policy limits.

Type of Insurance		**Limits of Liability**	
GENERAL LIABILITY:		Per Occurrence	Aggregate
* Policy to be written on a claims occurrence basis			
		$1,000,000	$2,000,000
XX	comprehensive form	bodily injury and property damage	
XX	premises - operations	bodily injury and property damage	
XX	explosion & collapse hazard		
XX	underground hazard	_____	
XX	products/completed operations hazard	bodily injury and property damage combined	
XX	contractual insurance	bodily injury and property damage combined	
XX	broad form property damage	bodily injury and property damage combined	
XX	independent contractors personal injury		
XX	personal injury		
__	CG2010	ongoing operations (or its' equivalent)	
__	CG 2037	completed operations (or its' equivalent)	
__	sexual abuse/molestation		
	Minimum $1,000,000 Per Occurrence and Aggregate		

AUTOMOBILE LIABILITY:

Minimum $1,000,000 Per Occurrence and Aggregate. Bodily injury (each person) bodily injury (each accident), property damage, bodily injury and property damage combined.

XX comprehensive form
XX owned
XX hired
XX non-owned

REAL & PERSONAL PROPERTY

* Policy to be written on a claims occurrence basis comprehensive form Agent must show proof they have this coverage.

EXCESS / UMBRELLA LIABILITY		Per Occurrence	Aggregate
* Policy to be written on a claims occurrence basis			
XX	excess/umbrella	bodily injury and property damage combined	$5,000,000	$5,000,000

PROFESSIONAL LIABILITY		Per Occurrence	Aggregate
* Policy to be written on a claims made basis			
XX	professional liability	$1,000,000	$1,000,000

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(3) If Professional Liability insurance is required, PROPOSER agrees the indemnification and hold harmless provisions of Section 12 of the Agreement shall survive the termination or expiration of the Agreement for a period of three (3) years unless terminated sooner by the applicable statute of limitations.

ENVIRONMENTAL / POLLUTION LIABILITY		Per Occurrence	Aggregate
* Policy to be written on a claims made basis			
XX	environmental/pollution liability	$1,000,000	$1,000,000

CYBER LIABILITY		Per Occurrence	Aggregate
* Policy to be written on a claims occurrence basis			
			$1,000,000	$1,000,000

__Network Security / Privacy Liability

__Breach Response / Notification Sublimit (minimum limit of 50% of policy aggregate)
__Technology Products E&O - $1,000,000 (only applicable for vendors supplying technology related services and or products)
__Coverage shall be maintained in effect during the period of the Agreement and for not less than four (4) years after termination/ completion of the Agreement.

C. Employer's Liability. PROPOSER and all subcontractors shall, for the benefit of their employees, provide, carry, maintain and pay for Employer's Liability Insurance in the minimum amount of One Hundred Thousand Dollars ($100,000.00) per employee, Five Hundred Thousand Dollars ($500,000) per aggregate.

D. Policies: Whenever, under the provisions of this Agreement, insurance is required of the PROPOSER, the PROPOSER shall promptly provide the following:

(1) Certificates of Insurance evidencing the required coverage;

(2) Names and addresses of companies providing coverage;

(3) Effective and expiration dates of policies; and

(4) A provision in all policies affording CITY thirty (30) days written notice by a carrier of any cancellation or material change in any policy.

E. Insurance Cancellation or Modification. Should any of the required insurance policies be canceled before the expiration date, or modified or substantially modified, the issuing company shall provide thirty (30) days written notice to the CITY.

F. Waiver of Subrogation. PROPOSER hereby waives any and all right of subrogation against the CITY, its officers, employees and agents for each required policy. When required by the insurer, or should a policy condition not permit an insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then PROPOSER shall notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy which includes a condition to the policy not specifically prohibiting such an endorsement, or voids coverage should PROPOSER enter into such an agreement on a pre-loss basis.

G. Hold Harmless and Indemnification

Proposer covenants and agrees that it will indemnify and hold harmless the City and all of its officers, agents, and employees from any claim, loss, damage, cost, charge or expense arising out of any act, action, neglect or omission by the Proposer, whether direct or indirect, or whether

to any person or property to which the City or said parties may be subject, except that neither the Proposer nor any of its subcontractors will be liable under this section for damages arising out of injury or damage to persons or property directly caused by or resulting from the sole negligence of the City or any of its officers, agents or employees.

H. Right to Audit

Contractor's records which shall include but not be limited to accounting records, written policies and procedures, computer records, disks and software, videos, photographs, subcontract files (including proposals of successful and unsuccessful bidders), originals estimates, estimating worksheets, correspondence, change order files (including documentation covering negotiated settlements), and any other supporting evidence necessary to substantiate charges related to this contract (all the foregoing hereinafter referred to as "records") shall be open to inspection and subject to audit and/or reproduction, during normal working hours, by Owner's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of any invoices, payments or claims submitted by the contractor or any of his payees pursuant to the execution of the contract. Such records subject to examination shall also include, but not be limited to, those records necessary to evaluate and verify direct and indirect costs (including overhead allocations) as they may apply to costs associated with this contract.

For the purpose of such audits, inspections, examinations and evaluations, the Owner's agent or authorized representative shall have access to said records from the effective date of this contract, for the duration of the Work, and until 5 years after the date of final payment by Owner to Consultant pursuant to this contract.

Owner's agent or its authorized representative shall have access to the Contractor's facilities, shall have access to all necessary records, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with this article. Owner's agent or its authorized representative shall give auditees reasonable advance notice of intended audits.

Contractor shall require all subcontractors, insurance agents, and material suppliers (payees) to comply with the provisions of this article by insertion of the requirements hereof in any written contract agreement. Failure to obtain such written contracts which include such provisions shall be reason to exclude some or all of the related payees' costs from amounts payable to the Contractor pursuant to this contract.

I. Retention of Records and Right to Access

The City of Pompano Beach is a public agency subject to Chapter 119, Florida Statutes. The Contractor shall comply with Florida’s Public Records Law, as amended. Specifically, the Contractor shall:

a. Keep and maintain public records required by the City in order to perform the service;

b. Upon request from the City’s custodian of public records, provide the City with a copy of requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes or as otherwise provided by law;

c. Ensure that public records that are exempt or that are confidential and exempt from public record requirements are not disclosed except as authorized by law;

d. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Contractor does not transfer the records to the City; and

e. Upon completion of the contract, transfer, at no cost to the City, all public records in possession of the Contractor, or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records in a format that is compatible with the information technology systems of the City.

J. Communications

No negotiations, decisions, or actions shall be initiated or executed by the firm as a result of any discussions with any City employee. Only those communications, which are in writing from the City, may be considered as a duly authorized expression on behalf of the City. In addition, only communications from firms that are signed and in writing will be recognized by the City as duly authorized expressions on behalf of firms.

K. No Discrimination

There shall be no discrimination as to race, sex, color, age, religion, or national origin in the operations conducted under any contract with the City.

L. Independent Contractor

The selected firm will conduct business as an independent contractor under the terms of this contract. Personnel services provided by the firm shall be by employees of the firm and subject to supervision by the firm, and not as officers, employees, or agents of the City. Personnel policies, tax responsibilities, social security and health insurance, employee benefits, purchasing policies and other similar administrative procedures applicable to services rendered under this agreement shall be those of the firm.

M. Staff Assignment

The City of Pompano Beach reserves the right to approve or reject, for any reasons, Proposer's staff assigned to this project at any time. Background checks may be required.

N. Contract Terms

The contract resulting from this Solicitation shall include, but not be limited to the following terms:

The contract shall include as a minimum, the entirety of this Solicitation document, together with the successful Proposer's proposal. Contract shall be prepared by the City of Pompano Beach City Attorney.

If the City of Pompano Beach defends any claim, demand, cause of action, or lawsuit arising out of any act, action, negligent acts or negligent omissions, or willful misconduct of the contractor, its employees, agents or servants during the performance of the contract, whether directly or indirectly, contractor agrees to reimburse the City of Pompano Beach for all expenses, attorney's fees, and court costs incurred in defending such claim, cause of action or lawsuit.

O. Waiver

It is agreed that no waiver or modification of the contract resulting from this Solicitation, or of any covenant, condition or limitation contained in it shall be valid unless it is in writing and duly executed by the party to be charged with it, and that no evidence of any waiver or modification shall be offered or received in evidence in any proceeding, arbitration, or litigation between the parties arising out of or affecting this contract, or the right or obligations of any party under it, unless such waiver or modification is in writing, duly executed as above. The parties agree that the provisions of this paragraph may not be waived except by a duly executed writing.

P. Survivorship Rights

This contract resulting from this Solicitation shall be binding on and inure to the benefit of the respective parties and their executors, administrators, heirs, personal representative, successors and assigns.

Q. Termination

The contract resulting from this Solicitation may be terminated by the City of Pompano Beach without cause upon providing contractor with at least sixty (60) days prior written notice.

Should either party fail to perform any of its obligations under the contract resulting from this Solicitation for a period of thirty (30) days after receipt of written notice of such failure, the non-defaulting part will have the right to terminate the contract immediately upon delivery of written notice to the defaulting part of its election to do so. The foregoing rights of termination are in addition to any other rights and remedies that such party may have.

R. Manner of Performance

Proposer agrees to perform its duties and obligations under the contract resulting from this Solicitation in a professional manner and in accordance with all applicable local, federal and state laws, rules and regulations.

Proposer agrees that the services provided under the contract resulting from this Solicitation shall be provided by employees that are educated, trained and experienced, certified and licensed in all areas encompassed within their designated duties. Proposer agrees to furnish the City of Pompano Beach with all documentation, certification, authorization, license, permit, or registration currently required by applicable laws or rules and regulations. Proposer further certifies that it and its employees are now in and will maintain good standing with such governmental agencies and that it and its employees will keep all license, permits, registration, authorization or certification required by applicable laws or regulations in full force and effect during the term of this contract. Failure of Proposer to comply with this paragraph shall constitute a material breach of contract.

S. Acceptance Period

Proposals submitted in response to this Solicitation must be valid for a period no less than ninety (90) days from the closing date of this solicitation.

T. Conditions and Provisions

The completed proposal (together with all required attachments) must be submitted electronically to City on or before the time and date stated herein. All Proposers, by electronic submission of a proposal, shall agree to comply with all of the conditions, requirements and instructions of this solicitation as stated or implied herein. All proposals and supporting materials submitted will become the property of the City.

Proposer's response shall not contain any alteration to the document posted other than entering data in spaces provided or including attachments as necessary. By submission of a response, Proposer affirms that a complete set of bid documents was obtained from the eBid System or from the Purchasing Division only and no alteration of any kind has been made to the solicitation. Exceptions or deviations to this proposal may not be added after the submittal date.

All Proposers are required to provide all information requested in this solicitation. Failure to do so may result in disqualification of the proposal.

The City reserves the right to postpone or cancel this solicitation, or reject all proposals, if in its sole discretion it deems it to be in the best interest of the City to do so.

The City reserves the right to waive any technical or formal errors or omissions and to reject all proposals, or to award contract for the items herein, in part or whole, if it is determined to be in the best interests of the City to do so.

The City shall not be liable for any costs incurred by the Proposer in the preparation of proposals or for any work performed in connection therein.

U. Standard Provisions

1. Governing Law

   Any agreement resulting from this Solicitation shall be governed by the laws of the State of Florida, and the venue for any legal action relating to such agreement will be in Broward County, Florida.

2. Licenses

   In order to perform public work, the successful Proposer shall:
   Be licensed to do business in Florida, if an entity, and hold or obtain such Contractor' and Business Licenses if required by State Statutes or local ordinances.

3. Conflict of Interest

   For purposes of determining any possible conflict of interest, each Proposer must disclose if any Elected Official, Appointed Official, or City Employee is also an owner, corporate officer, or an employee of the firm.

If any Elected Official, Appointed Official, or City Employee is an owner, corporate officer, or an employee, the Proposer must file a statement with the Broward County Supervisor of Elections pursuant to §112.313, Florida Statutes.

4. Drug Free Workplace

The selected firm(s) will be required to verify they will operate a "Drug Free Workplace" as set forth in Florida Statute, 287.087.

5. Public Entity Crimes

A person or affiliate who has been placed on the convicted vendor list following a conviction for public entity crime may not submit a proposal on a contract to provide any goods or services to a public entity, may not submit a proposal on a contract with a public entity for the construction or repair of a public building or public work, may not submit proposals on leases of real property to public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Florida Statute, Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

6. Patent Fees, Royalties, And Licenses

If the selected Proposer requires or desires to use any design, trademark, device, material or process covered by letters of patent or copyright, the selected Proposer and his surety shall indemnify and hold harmless the City from any and all claims for infringement by reason of the use of any such patented design, device, trademark, copyright, material or process in connection with the work agreed to be performed and shall indemnify the City from any cost, expense, royalty or damage which the City may be obligated to pay by reason of any infringement at any time during or after completion of the work.

7. Permits

The selected Proposer shall be responsible for obtaining all permits, licenses, certifications, etc., required by federal, state, county, and municipal laws, regulations, codes, and ordinances for the performance of the work required in these specifications and to conform to the requirements of said legislation.

8. Familiarity with Laws

It is assumed the selected firm(s) will be familiar with all federal, state and local laws, ordinances, rules and regulations that may affect its services pursuant to this Solicitation. Ignorance on the part of the firm will in no way relieve the firm from responsibility.

9. Withdrawal of Proposals

A firm may withdraw its proposal without prejudice no later than the advertised deadline for submission of proposals by written communication to the General Services Department, 1190 N.E. 3rd Avenue, Building C, Pompano Beach, Florida 33060.

10. Composition of Project Team

Firms are required to commit that the principals and personnel named in the proposal will perform the services throughout the contractual term unless otherwise provided for by way of a negotiated contract or written amendment to same executed by both parties. No diversion or substitution of principals or personnel will be allowed unless a written request that sets forth the qualifications and experience of the proposed replacement(s) is submitted to and approved by the City in writing.

11. Invoicing/Payment

All invoices should be sent to City of Pompano Beach, Accounts Payable, P.O. Drawer 1300, Pompano Beach, Florida, 33061. In accordance with Florida Statutes, Chapter 218, payment will be made within 45 days after receipt of a proper invoice.

12. Public Records

a. The City of Pompano Beach is a public agency subject to Chapter 119, Florida Statutes. The Contractor shall comply with Florida's Public Records Law, as amended. Specifically, the Contractor shall:

i. Keep and maintain public records required by the City in order to perform the service;

ii. Upon request from the City's custodian of public records, provide the City with a copy of requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes or as otherwise provided by law;

iii. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Contractor does not transfer the records to the City; and

iv. Upon completion of the contract, transfer, at no cost to the City, all public records in possession of the Contractor, or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the

City, upon request from the City's custodian of public records in a format that is compatible with the information technology systems of the City.

b. Failure of the Contractor to provide the above described public records to the City within a reasonable time may subject Contractor to penalties under 119.10, Florida Statutes, as amended.

PUBLIC RECORDS CUSTODIAN

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

CITY CLERK
100 W. Atlantic Blvd., Suite 253
Pompano Beach, Florida 33060
(954) 786-4611
RecordsCustodian@copbfl.com

V. Questions and Communication

All questions regarding the Solicitation are to be submitted using the Questions feature in the eBid System. Questions must be received at least seven (7) calendar days before the scheduled solicitation opening. Oral and other interpretations or clarifications will be without legal effect. Addenda will be posted to the solicitation in the eBid System, and it is the Proposer's responsibility to obtain all addenda before submitting a response to the solicitation.

W. Addenda

The issuance of a written addendum or posting of an answer in response to a question submitted using the Questions feature in the eBid System are the only official methods whereby interpretation, clarification, or additional information can be given. If any addenda are issued to this solicitation the addendum will be issued via the eBid System. It shall be the responsibility of each Proposer, prior to submitting their response, to contact the City Purchasing Office at (954) 786-4098 to determine if addenda were issued and to make such addenda a part of their proposal. Addenda will be posted to the solicitation in the eBid System.

X. Contractor Performance Report

The City will utilize the Contractor Performance Report to monitor and record the successful proposer's performance for the work specified by the contract. The Contractor Performance Report has been included as an exhibit to this solicitation.

City of Pompano Beach, Purchasing Division
1190 N.E. 3rd Avenue, Building C
Pompano Beach, Florida, 33060

January 27, 2020

ADDENDUM #1 BID E-04-20

Master Plan Update, and Consulting Services for
Water Treatment Plant 5 kV Electrical System

To Whom It May Concern,

Non-Mandatory Site Visit Scheduled:

This will NOT be a mandatory pre-bid. We will offer a one-time visit to tour the plant on **Tuesday February 4th from 1:30-3:00pm**. While this visit is NOT mandatory, we highly recommend all potential bidders attend this site visit.

The remainder of the solicitation is unchanged at this time.

Sincerely,

Jeffrey English, Purchasing Agent

City of Pompano Beach, Purchasing Division
1190 N.E. 3rd Avenue, Building C
Pompano Beach, Florida, 33060

February 11, 2020

ADDENDUM #2 BID E-04-20

Master Plan Update, and Consulting Services for
Water Treatment Plant 5 kV Electrical System

To Whom It May Concern,

The following items have been added to the Attachments tab:

1. Tech Memo No.1
2. Optional Site Visit

Addendum #2 is posted on the City's eBid website: http://pompanobeachfl.ionwave.net. Acknowledge receipt of this Addendum using the Addendum Attribute on the Attributes tab in the eBid System.

The deadline for Questions and Answers in the eBid system has been changed **5:00 p.m. (local), February 13, 2020.**

The deadline for acceptance of proposals in the eBid system is **2:00 p.m. (local), February 20, 2020.**

The remainder of the solicitation is unchanged at this time.

Sincerely,

Jeffrey English, Purchasing Agent

City of Pompano Beach
Lime Softening Water Treatment Plant

TECHNICAL MEMORANDUM No. 1

EVALUATION OF 5 kV ELECTRICAL SYSTEM FOR MASTER PLANNING UPGRADES

FINAL
July 2012

1301 INTERNATIONAL PARKWAY • SUITE 550 • SUNRISE, FLORIDA 33321 • (954) 837-0030 • FAX (954) 837-0035

City of Pompano Beach
Lime Softening Water Treatment Plant

TECHNICAL MEMORANDUM No. 1

EVALUATION OF 5 kV ELECTRICAL SYSTEM FOR MASTER PLANNING UPGRADES

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EVALUATION OF 5 KV ELECTRICAL SYSTEM FOR MASTER PLANNING UPGRADES

1.0 EXECUTIVE SUMMARY

1.1 Background

The City of Pompano Beach's Water Treatment Plants (WTPs) and associated high service pump stations provide the vital service of potable water supply to the City's residents and businesses, including water for fire protection. Electrical service from Florida Power and Light (FPL) is used to power the lime softening and nanofiltration WTPs and high service pump stations. The reliability of the WTPs electrical systems is considered critical and the continuous operation of the facilities depends on the proper functioning of the systems.

This technical memorandum evaluates the electrical systems for the lime softening plant and the high service pump stations. This technical memorandum does not include the evaluation of the electrical system for the nanofiltration facility, because that system was constructed in 2002 and since it is relatively new, it was not included in this study.

The master planning work included assessment of numerous pieces of obsolete and deteriorating electrical equipment that requires replacement, assessment of options for reducing quantities of equipment by combining equipment function while maintaining reliability for power distribution and standby power generation, and development of alternatives for master planning the upgrades. The recommendations can be used as a basis for capital budget projections and scoping of work to design and construct the vital improvements in separate construction phases.

1.2 Criteria for Upgrades

The approach and criteria for upgrading the existing power distribution system was based upon the following guidelines:

Flexibility and space for future additions to the WTP has been considered from a process perspective, and accommodated by this master plan through allowance for load growth within the electrical power system. Operating equipment that should be replaced due to its present working condition has been identified and is listed later in this memorandum.

In addition, state of the art electrical technologies were evaluated for replacement of near obsolete equipment, to provide safe and reliable functionality, and also to increase safety, operability, redundancy, and ultimately, increase value and minimize capital for construction and future maintenance.

1.3 Findings and Recommendations

The assessment of the existing 5 KV switchgear, 5 KV generators, outdoor 5 kV switches, indoor 5 kV to 480 volt transformers and 480 volt motor control centers revealed that most existing equipment is near the end of useful duty cycle and the equipment should be replaced to maintain a reliable and safe power distribution system. The recommendations for an upgrade of the power distribution system, from a master planning perspective, are summarized as follows:

- **Phase I for Short Term Improvements at High Service Pump Building Nos. 1 - 4:**
  - Replace existing outdoor "14PPSS" 5 kV Switches and Indoor 5 kV Motor Control Center (MCC) located on the mezzanine with a combined 5 kV motor control center. Existing building rooms that were previously used for storing files and for a small generator could be used for housing the proposed 5 kV equipment. These existing rooms will require internal improvements for wall finish, floor concrete pads for new electrical equipment, replacement of doors, new lighting system and air conditioning.
  - Planning Level Capital Cost Estimate: $1,210,000
- **Phase II for Improvements at High Service Pump Building Nos. 1 - 4:**
  - Replace existing indoor "TU-4" transformer and relocate to outdoor concrete pad to avoid heat losses into electrical room. Also, replace indoor 480 volts "14SWB1" switchboard with a new motor control center consisting of double electric bus sections, with two sources of input power and a tie circuit breaker, and replace related 480 volt and 120 volt panelboards.
  - Planning Level Capital Cost Estimate: $495,000
- **Phase III for Improvements at High Service Pump Building Nos. 5 - 6:**
  - The main electrical room should be increased in space to facilitate the installation of new 5 kV switchgear, while the existing 5 kV equipment supplies power to the plant.
  - The modifications to the existing building will include the relocation of one high service pump No. 6 and relocation of the engine driven pump, to modify floor space in the mechanical room and construct a new partition wall between the mechanical pump room and the electrical room for a larger electrical room space that would facilitate installation of new redundant 5 kV switchgear, new control panels for existing generators and new 480 volt motor control center.
  - During the construction of the proposed phase III, the existing indoor 5 kV/ 480 volt transformer and the switchboard "20PPSS", which are in the mechanical room should be replaced with new equipment to clear mechanical room space and for relocating the pumps.

  - The relocation of two pumps plus the construction of new partition wall and the improvements in electrical room space should not interfere with the functioning of the existing main 5 kV switchgear (20 SWGR1) and generator controls.
  - Planning Level Capital Cost Estimate: $727,000

- Phase IV for Electrical Improvements at High Service Pump Building Nos. 5 - 6:
  - Replace existing main 5 kV "20 SWGR1" switchgear, generator control panels and 480 volts motor control center located in main electrical room. The 5 kV starters for high service pumps No. 5 and No. 6 could be replaced with future speed controllers or VFDs and they should be installed indoor with air conditioning.
  - The 480-volt motor control center in the main electrical room should be replaced with two sources of power supply breakers, a tie breaker for convenience to isolate half of the MCC for periodic inspection or maintenance.
  - The low voltage controls for the standby generators should be in separate cabinets and located away from the 5 kV equipment, to minimize risk of arc flash hazards when personnel may be doing manual generator's control.
  - Planning Level Capital Cost Estimate: $2,304,000

- **Phase V for Improvements at Transfer Pump Building "TU-3," "TU-2" Electrical Building, and "TU-1" Electrical Building:**
  - Delete existing indoor 5 kV switches, the 5 kV/480 volt transformers.
  - Relocate indoor transformers in "TU-1," "TU-2," and "TU-3" with only two outdoor pad mounted transformers and install them adjacent to the existing electrical building "TU-2"
  - Additionally, the function of the 480 volt switchboards at "TU-1," "TU-2," and "TU-3" could be replaced with only one "double-ended" 480 volt switchboard that will supply power to the transfer pumps, chemical building and to the dewatering building.
  - The existing electrical building "TU-2" was constructed with pre-fabricated wall panels and it has minimum overhead clearances. Therefore, the building shall be replaced with a taller structure and ample space with air conditioning.
  - Planning Level Capital Cost Estimate: $2,238,000

- **Other Improvements: Existing 480 Volt Motor Control Centers:**
  - The assessment of the existing 480-volt motor control centers condition is not included on the scope of this technical memorandum. However, suggestions are offered as another opinion for the future replacement of existing 480-volt equipment. Future 480-volt motor control center equipment should consist of double-ended scheme with two sources of input power and a tie circuit breaker,

for convenience to isolate half of the MCC for periodic inspection or maintenance.

- **Periodic Maintenance Improvements:**
  - The electrical equipment requires periodic inspections and testing, for verification of adequate insulation condition and assurance that conductive parts and bolted connections have not decayed due to possible overheating or corrosion. This periodic maintenance requires the momentary shutdown of energized equipment and use of sophisticated testing equipment.
  - The professional services of specialty testing companies becomes necessary and represents a periodic expense as part of the plant budget for operation and maintenance. Therefore, the allocation of budget is recommended for periodic testing of electrical equipment.

2.0 BACKGROUND

The WTP consists of split treatment trains that have different treatment processes. A portion of the water is treated by the original lime softening plant (40 mgd capacity) and the remaining water is treated by nanofiltration membranes (10 mgd capacity with an ultimate build out of 20 mgd). The treated water from each treatment process is blended together and then pumped into the water distribution system.

Each of the water treatment processes has a separate electric service and transformer from Florida Power and Light (FPL) utility. The original electric system for the lime softening treatment plant consist of two (2) service FPL transformers (within a vault room) that step the voltage down from 13 kV to 5 kV, with 2 diesel engine driven generators for 5 kV standby power and one 5 kV switchgear for power distribution throughout the plant, which are located in the High Service Pumps Building Nos. 5 - 6. This technical memorandum evaluates the electrical system for the lime softening facility and the high service pump stations.

The second and separate electric system for the membrane treatment process consists of one (1) service FPL pad mounted transformer that steps the voltage down from 13 kV to 480 volts, with one diesel engine driven 480-volt generator for standby power within the membrane facility. This technical memorandum does not include the evaluation of the electrical system for the membrane facility, because that system was constructed in 2002 and since it is relatively new, it was not included in this study.

In 2009, the City performed a condition assessment of the existing electrical 5 kV power distribution equipment, standby power generation system and underground 5 kV cables and based on the pertinent findings, age of equipment and corrosive condition for elements that were located outdoors, the City's building department electrical inspectors and other consultants recommended the replacement of the major electrical equipment. The

recommendations of these studies kept the basic overall configuration and equipment quantity of the existing power distribution system, simply replacing the equipment in kind.

In 2011, Carollo Engineers performed an assessment of the original power distribution system, which included a review of electrical record drawings dated May 30, 1981; reviewed previously prepared Technical Memoranda dated August 2009 and October 2010 (by other consultants), made physical observations of the configuration of 5 kV power distribution, 5 kV standby power generators, 5 kV motor control centers, indoor 5 kV/480 volt transformers and observed outdoor 5 kV equipment that has corrosive impacts due to humidity and examined related 480 volt switchgear that is near the end of its useful life.

Carollo found additional issues such as key main 5 kV equipment with a configuration that a possible single point of failure could potentially cause shutdown of the entire plant, and identified 5 kV transformers and switchboards with a very small electrical load that could be combined with less new equipment quantity, resulting in the reduction of the capital cost to perform the needed upgrades. These ideas and recommendations were not included in the previous condition assessments.

Subsequently, the City retained Carollo Engineers to further review the existing power distribution and power generation systems for the lime softening plant and high service pumps of the WTP, determine viable alternatives for future upgrade of obsolete equipment in several construction phases, and allow staging of the work within future budget years.

3.0 OBJECTIVES

The purpose of this work is the evaluation and master planning of the 5 kV electrical system of the lime-softening portion of the WTP and the high service pumping stations. The work included assessment of numerous pieces of obsolete and deteriorating electrical equipment that require replacement, assessment of options for reducing quantities of equipment by combining equipment function while maintaining reliability for power distribution and standby power generation, and development of alternatives for master planning the upgrades. The recommendations can be used as a basis for capital budget projections and scope of work to design and construct the vital improvements in separate construction phases.

4.0 ASSESSMENT OF EXISTING 5 KV ELECTRICAL SYSTEM

4.1 Existing Electrical Equipment Condition

The condition of existing electrical equipment has been evaluated based on field observations and previous equipment test results performed by an independent electrical equipment testing company.

Table 1 includes a summary of the equipment assessment.

Table 1 Assessment of Power Distribution Equipment and Generation System and Recommended Actions
Lime Softening Water Treatment Plant
City of Pompano Beach

Equipment	Service	Physical Condition	Code Violation Identified	Located in Flood Area[1]	Action Recommended
20 SWGR	5 kV Main Service	Fair/Old	No	No	Replace switchgear under the future Phase III Upgrade
20 GEN Controls	Controls for two 5 kV Generators	Fair/Old	No	No	
Gen 1 -900 kW	5 kV Standby Power to 20 SWGR	Good	No	No	
Gen 2 -900 kW	5 kV Standby Power to 20 SWGR	Good	No	No	
5 kV MCC-1A & 1B	High Service Pump Nos. 1-4	Fair/old	No	No	Future Replacement with 5 kV VFDs
480 V MCC	Power for Generators 1, Generator 2 and other Loads at Main Electric Room	Fair/old	No	No	Future Replacement
5 kV (20PPSS)	Outdoor 5 kV Switches for Transformer TU-6	Poor/Old	No	No	Replace with Different Indoor Equipment
Transformer 20PPSS	480 V to SWBD 20PPSS	Fair/Old	No	No	Replace with Outdoor Equipment
SWBD 20PPSS	Power to multiple MCCs	Old	No	No	Replace in Conditioned Space / Building
Transf T-1 750 kVA	Dewatering Building	Fair	Yes	No	All four transformers may get replaced depending on the final distribution system
T-1 480 V SWB	Dewatering Building	Fair	No	No	
Transf T-2 750 kVA	Chemical Building	Fair	Yes	No	
T-2 480 V SWB	Chemical Building	Fair	No	No	
Transf T-3 750 kVA	Transfer Pumps	Fair	Yes	No	
T-3 480 V SWB	Transfer Pumps	Fair	No	No	
Transf T-4 750 kVA	Switchboard 14 SWB	Fair	No	No	
Switchboard 14 SWB	HS Pump 1 & MCC-14	Fair/Poor	No	No	

Note:
(1) Determination of condition made by visual observation

4.2 Configuration of Existing Electrical Equipment

The major components of the 5 kV electrical system for the lime-softening portion of the WTP are located throughout the plant as shown in Partial Site Plans I and Partial Site Plan II, and Figure 1 and Figure 2.

The interconnection of the 5 kV electrical equipment and configuration of the system is shown in the one line diagram as Figure 3.

4.2.1 Original 5 kV Electrical Design and Previous Upgrades

The original electrical design of the 5 kV power distribution system included the equipment for the high service pumping stations and the equipment in the control building, which involved a very small quantity of process equipment and electrical load, consequently the required spaces in electrical rooms were relatively minimal.

During the previous 1981 upgrade of the lime softening facility, the original electrical equipment was reused and expanded with one 5 kV cable loop feeder(s) that distributed power to outdoor 5 kV switches at "14PPSS," "20PPSS," and remote transformers at locations in electrical buildings "TU-1," "TU-2," and "TU-3". The 5 kV cable loop around the lime softening plant is supposed to carry electrical loads from the remote 5 kV "TU" transformers and High Service Pump Nos. 1 - 4 back to the main 5 kV switchgear "20 SWGR".

The original 5 kV system has the following disadvantages:

- The original size of existing 5 kV underground cables were number 4/0 cable, which is not capable of carrying the continuous possible lime softening process load, plus the load of the high service pumps if one of the loop 5 kV switches is open.
- The use of the outdoor type 5 kV switches is subject to continuous exposure to environmental humidity and there will be progressive decaying due to corrosion.

4.2.2 Reduction of 5 kV Electrical Load with Nanofiltration Upgrades

As a result of the previous addition of the nanofiltration WTP and its separate 480 volt electrical service, the power demands on the electrical system supplying the lime softening facility were substantially reduced, consequently the present electrical load in remote transformers at locations in electrical buildings "TU-1," "TU-2," and "TU-3" is only a fraction of the original equipment electrical load capacity. Therefore, the replacement of existing 5 kV equipment with equal type equipment at electrical buildings with transformers "TU-1," "TU-2," and "TU-3" is not justifiable from a load or capital cost perspective.

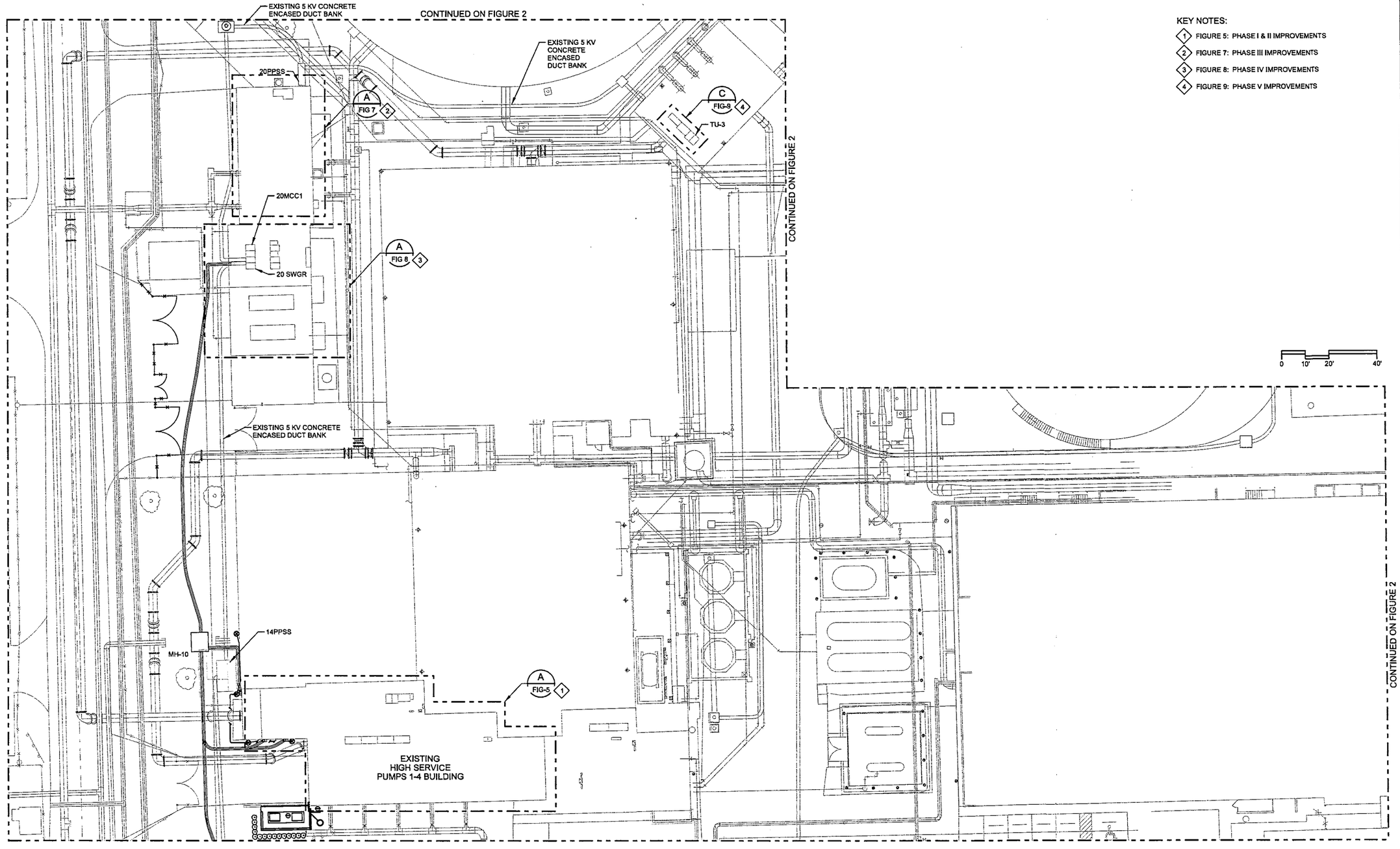

Figure No. 1

LOCATION OF ELECTRICAL EQUIPMENT - PARTIAL PLAN I

COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES

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KEY NOTES:

1 FIGURE 8: PHASE V IMPROVEMENTS

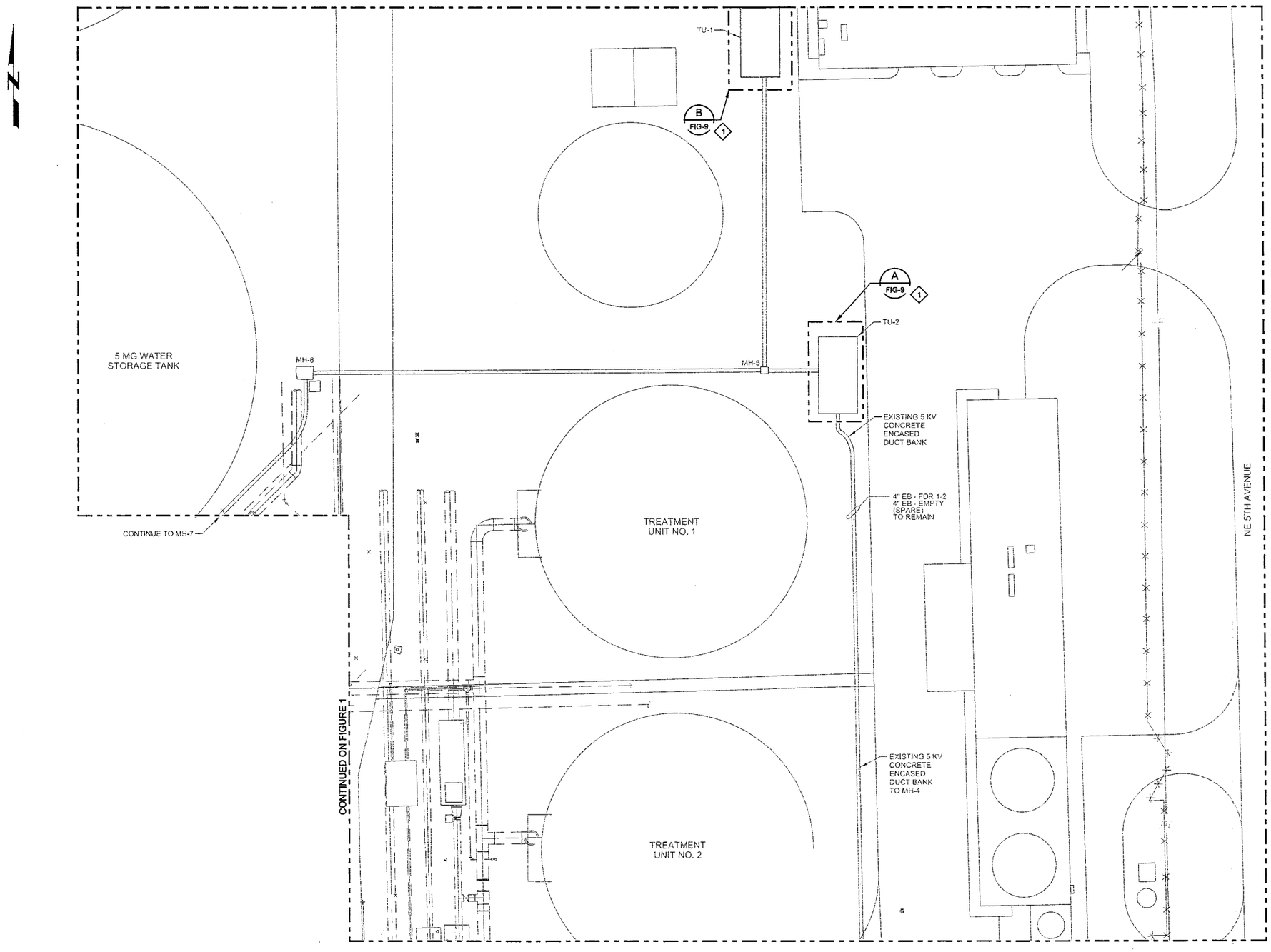

Figure No. 2

LOCATION OF ELECTRICAL EQUIPMENT - PARTIAL PLAN II

COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES

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MAIN SWITCHGEAR
20 SWGR EXST.
1200A, 4160Y/2400V, 3Ø, 4W
GENERATOR SYNCHRONIZING EQUIPMENT
FP&L REVENUE METER
FEEDER 2
FEEDER 1 (LOOP)
NEW FEEDER 1
FP&L SUBSTATION
2-1500 KVA
13200-4160Y/2400V
EXST
EXST PRIMARY UNDERGROUND FEEDER
IN CONDUIT

HIGH SERVICE PUMP MCC
20 MCC 1
170A CLF
CPT
REACTOR 50% TAP
HIGH SERVICE PUMP P-04-C-1 EXST
HIGH SERVICE PUMP P-04-6-2

GENERATOR SWITCHGEAR
20 GEN 1
20 GEN 2
1200A, 4160Y/2400, 3Ø 4W
CPT 1KVA 4160-240/120
PT'S 4200-120
900 KW DIESEL GENERATORS
M-08-14 EXST
M-08-15

ADMINISTRATION BLDG
01CB1
01SB1
1000A, 208Y/120, 3Ø, 4W
01T1
225 KVA
480-208Y/120V
3Ø, 4W
01LL1
01LL2
01LL3
01LL4

KEY NOTES:
1 PROPOSED REPLACEMENT PHASE II IMPROVEMENTS

CONTROL BLDG
UNIT SUBSTATION TU-4 1
14SB1 1
750 KVA
4160-480Y/277V
1200AT 1600AF
400AT 800AF
14MCC1
P-04-6-6
12PP1
14PP1
TIE TO 20PP1

TRANSFER PUMPING STATION
UNIT SUBSTATION TU-3
32MCC1
600A, 4160V, 3Ø, 3W
750 KVA
4160-480Y/277V
1200AT 1600AF
TIE TO TU-1

20PPSS
600A, 4160V, 3Ø, 3W
65E

HIGH SERVICE PUMP BLDG
UNIT SUBSTATION TU-6
EXST.
20PP1
500 KVA
4160-480Y/277V
TIE TO 14SB1
20MCC1
P-04-7-1

14PPSS
600A, 4160V, 3Ø, 3W
200E
100E
PROPOSED PHASE I DEMOLITION

SLUDGE DEWATERING BLDG
UNIT SUBSTATION TU-1
81SB1
600A, 4160V, 3Ø, 3W
750 KVA
4160-480Y/277V
1200AT 1600AF
400AT 800AF
1600 NA
100E
81MCC1
81MCC2
81PP1
TIE TO TU-2
TIE TO TU-3
IN CONDUIT M-230

CHEMICAL BLDG
UNIT SUBSTATION TU-2
90SB1
600A, 4160V, 3Ø, 3W
750 KVA
4160-480Y/277V
1200AT 1600AF
400AT 800AF
1600 NA
100E
90MCC1
90MCC2
90PP2
TIE TO TU-1

IN CONDUIT M-010
EXISTING 4.16 KV MCC SUPPLY POWER TO HIGH SERVICE PUMPS P-2 THROUGH P-4
TO BE REMOVED AFTER INSTALLATION OF NEW 5 KV MCC
IN CONDUIT
FEEDER 2
FEEDER 1
FEEDER 2 (LOOP)
TEMPORARY SPLICE
EXISTING MH-1
PROPOSED NEW 5 KV MCC-A NEW 5 KV MCC-B PHASE I IMPROVEMENTS SEE FIGURES 4 & 5

Figure No. 3
EXISTING 5 KV ONE LINE DIAGRAM
COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES
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Consequently, the replacement of existing equipment should consist of a modified configuration for power distribution with less electrical equipment. A simple scheme with two 5 kV pad mounted transformers and a two section 480 volt switchgear would be sufficient. A single system for power distribution equipment could be located near the facilities for the chemical building, the transfer pumps building and the dewatering building, in lieu of the existing multiple 5 kV equipment at buildings "TU-1," "TU-2," and "TU-3".

5.0 CRITERIA FOR POWER DISTRIBUTION SYSTEM UPGRADES

The approach and criteria for upgrading the existing power distribution system will be based upon the following guidelines:

Flexibility and space for future additions to the WTP has been considered from a process perspective, as an allowance for load growth within the electrical power system. Operating equipment that should be replaced due to its present working condition has been identified and is listed later in this memorandum.

In addition, state of the art electrical technologies should be considered for replacement of near obsolete equipment, to provide safe and reliable functionality, and also increase safety, operability, redundancy, and ultimately, increase value and minimize capital for construction and future maintenance.

The criteria for upgrading the power distribution system should also include the following:

- Underground manholes need ample space for working clearances (not similar to existing small boxes).
- Medium voltage cables for 5 kV application need a higher voltage rating of at least 8 kV at 133 percent insulation.
- All indoor electrical equipment needs to be placed in air-conditioned space to prevent corrosion due to humidity conditions in Florida.

6.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The assessment of the existing 5 kV switchgear, 5 kV generators, outdoor 5 kV switches, indoor 5 kV to 480 volt transformers and 480 volt motor control centers revealed that most existing equipment is near the end of useful duty cycle and the equipment should be replaced to maintain a reliable and safe power distribution system. Table 1 (shown above in Section 4.0) summarizes the condition of the electrical equipment, and the figures with equipment photos in Appendix A identify reliability and safety issues with pertinent recommendations to resolve the issues.

The recommendations for an upgrade of the power distribution system, using a master planning perspective, are summarized as follows:

- **Phase I for Short Term Improvements at High Service Pump Building Nos. 1 - 4:**
  - Replace existing outdoor "14PPSS" 5 kV Switches and Indoor 5 kV Motor Control Center (MCC) located on the mezzanine with a combined 5 kV motor control center. Existing building rooms that were previously used for storing files and for a small generator could be used for housing the proposed 5 kV equipment. These existing rooms will require internal improvements for wall finish, floor concrete pads for new electrical equipment, replacement of doors, new lighting system and air conditioning.
  - Planning Level Capital Cost Estimate: $1,210,000
- **Phase II for Improvements at High Service Pump Building Nos. 1 - 4:**
  - Replace existing indoor "TU-4" transformer and relocate to outdoor concrete pad to avoid heat losses into electrical room. Also, replace indoor 480 volts "14SWB1" switchboard with a new motor control center consisting of double electric bus sections, with two sources of input power and a tie circuit breaker, and replace related 480 volt and 120 volt panelboards.
  - Planning Level Capital Cost Estimate: $495,000
- **Phase III for Improvements at High Service Pump Building Nos. 5 - 6:**
  - The main electrical room should be increased in space to facilitate the installation of new 5 kV switchgear, while the existing 5 kV equipment supplies power to the plant.
  - The modifications to the existing building will include the relocation of one high service pump No. 6 and relocation of the engine driven pump, to modify floor space in the mechanical room and construct a new partition wall between the mechanical pump room and the electrical room for a larger electrical room space that would facilitate installation of new redundant 5 kV switchgear, new control panels for existing generators and new 480 volt motor control center.
  - During the construction of the proposed phase III, the existing indoor 5 kV/480 volt transformer and the switchboard "20PPSS", which are in the mechanical room should be replaced with new equipment to clear mechanical room space and for relocating the pumps.
  - The relocation of two pumps plus the construction of new partition wall and the improvements in electrical room space should not interfere with the functioning of the existing main 5 kV switchgear (20 SWGR1) and generator controls.
  - Planning Level Capital Cost Estimate: $727,000

- **Phase IV for Electrical Improvements at High Service Pump Building Nos. 5 - 6:**
  - Replace existing main 5 kV "20 SWGR1" switchgear, generator control panels and 480 volts motor control center located in main electrical room. The 5 kV starters for high service pumps No. 5 and No. 6 could be replaced with future speed controllers or VFDs and they should be installed indoor with air conditioning.
  - The 480-volt motor control center in the main electrical room should be replaced with two sources of power supply breakers, a tie breaker for convenience to isolate half of the MCC for periodic inspection or maintenance.
  - The low voltage controls for the standby generators should be in separate cabinets and located away from the 5 kV equipment, to minimize risk of arc flash hazards when personnel may be doing manual generator's control.
  - Planning Level Capital Cost Estimate: $2,304,000
- **Phase V for Improvements at Transfer Pump Building "TU-3," "TU-2" Electrical Building, and "TU-1" Electrical Building:**
  - Delete existing indoor 5 kV switches, the 5 kV/480 volt transformers.
  - Relocate indoor transformers in "TU-1," "TU-2," and "TU-3" with only two outdoor pad mounted transformers and install them adjacent to the existing electrical building "TU-2"
  - Additionally, the function of the 480 volt switchboards at "TU-1," "TU-2," and "TU-3" could be replaced with only one "double-ended" 480 volt switchboard that will supply power to the transfer pumps, chemical building and to the dewatering building.
  - The existing electrical building "TU-2" was constructed with pre-fabricated wall panels and it has minimum overhead clearances. Therefore, the building shall be replaced with a taller structure and ample space with air conditioning.
  - Planning Level Capital Cost Estimate: $2,238,000
- **Other Improvements: Existing 480 Volt Motor Control Centers:**
  - The assessment of the existing 480-volt motor control centers condition is not included on the scope of this technical memorandum. However, suggestions are offered as another opinion for the future replacement of existing 480-volt equipment. Future 480-volt motor control center equipment should consist of double-ended scheme with two sources of input power and a tie circuit breaker, for convenience to isolate half of the MCC for periodic inspection or maintenance.

- **Periodic Maintenance Improvements:**
  - The electrical equipment requires periodic inspections and testing, for verification of adequate insulation condition and assurance that conductive parts and bolted connections have not decayed due to possible overheating or corrosion. This periodic maintenance requires the momentary shutdown of energized equipment and use of sophisticated testing equipment.
  - The professional services of specialty testing companies becomes necessary and represents a periodic expense as part of the plant budget for operation and maintenance. Therefore, the allocation of budget is recommended for periodic testing of electrical equipment.

An opinion of probable construction cost for improvements in multiple construction phases is shown in Section 8.0.

7.0 PROPOSED RECONFIGURATION OF ELECTRICAL SYSTEM

7.1.1 Short Term – Phase I and Phase II Improvements of 5 kV Electrical System

The 5 kV electrical outdoor switches (14PPSS) and the 5 kV motor control center in the mezzanine of the High Service Pumps 1-4 Building are in unreliable condition due to severe corrosion and according to previous electrical test results obtained by the City staff. This equipment is critical for the reliability of the WTP to pump water to the City, therefore, the replacement is urgent and is recommended as part of the Phase I and Phase II electrical improvements.

The interconnection of the proposed 5 kV electrical equipment for the high service pumping station 1-4 building with the existing 5 kV system is shown in the one line diagram of Figure 3. Also, the proposed configuration of the new system is shown in Figure 4 and the location in the High Service Pump Nos. 1 - 4 Building is shown in Figure 5.

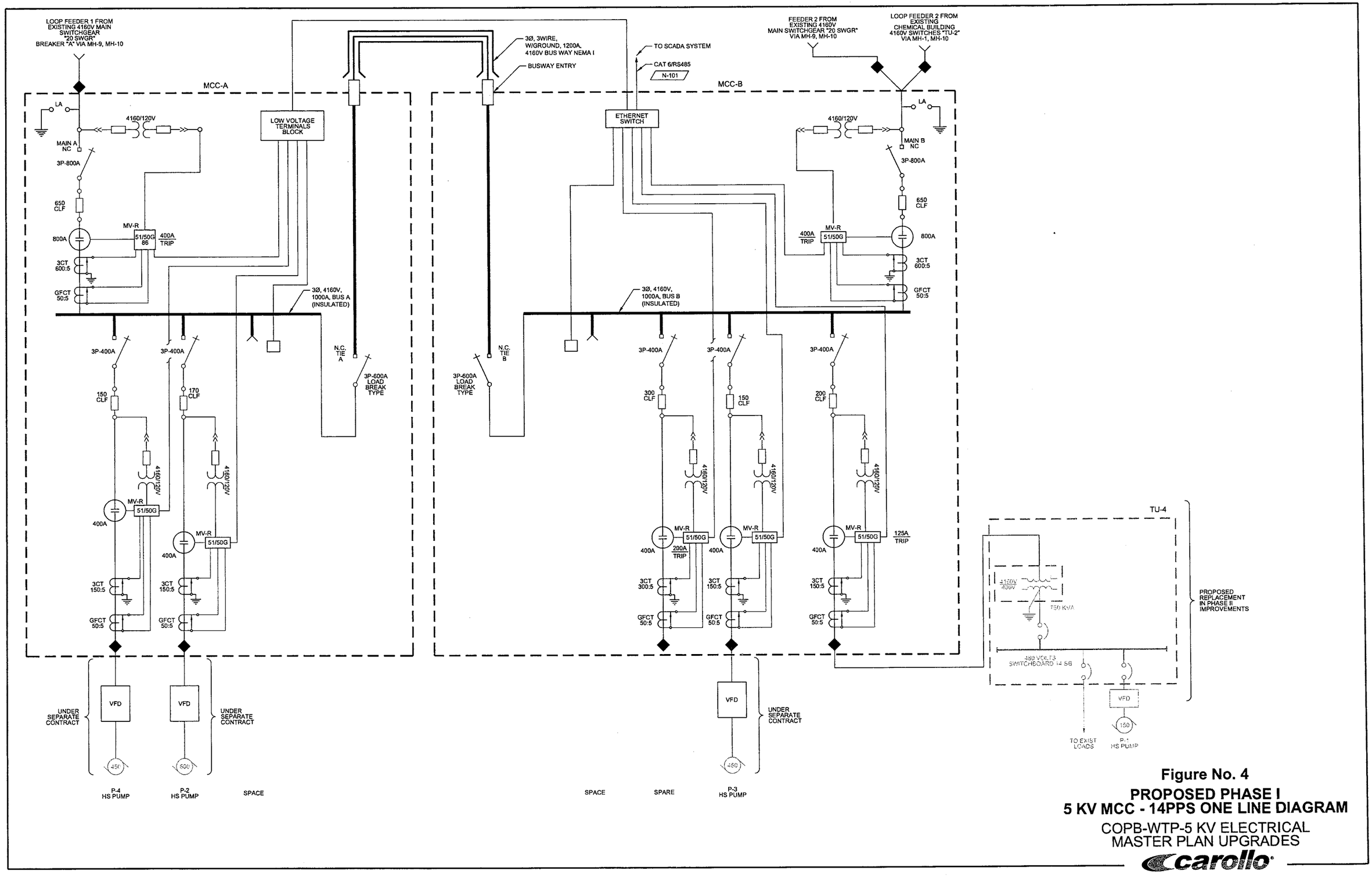

Figure No. 4

PROPOSED PHASE I
5 KV MCC - 14PPS ONE LINE DIAGRAM

COPB-WTP-5 KV ELECTRICAL
MASTER PLAN UPGRADES

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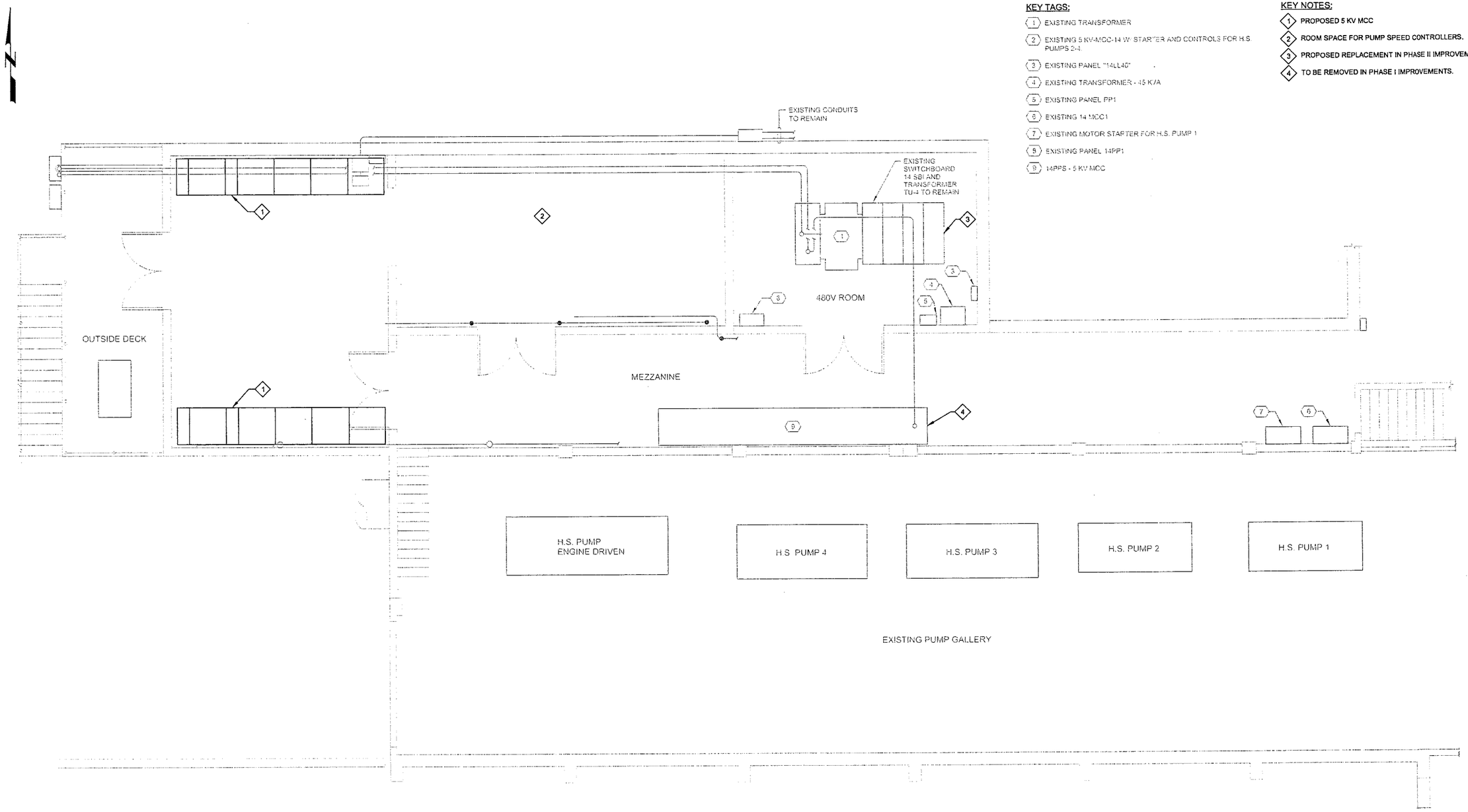

HIGH SERVICE PUMPS 1-4 BUILDING PLAN

SCALE: 1/4" = 1'
FILE:

Figure No. 5
PROPOSED PHASES I AND II IMPROVEMENTS
COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES
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7.1.2 Configuration for Entire 5 kV Power Distribution System

The proposed layout and re-configuration of the 5 kV system will consist of the following:

- Design a main 5 kV switchgear that includes two breakers for separate input power sources, one from FPL and another one from the standby generators. Also, include at least one (or two) 5 kV tie circuit breaker(s) that facilitates separation of the main bus in two separate sections, for convenience of shutting down half of the bus for periodic inspections and/or possible maintenance.
- The main 5 kV switchgear should have two busses with circuit breakers for supplying redundant power to remote transformers and to double-ended 5 kV motor control center at High Service Pump Nos. 1 - 4 Building.
- The 5 kV main switchgear should include the separate circuit breakers for interconnection with the standby 5 kV generators.
- The low voltage controls for the 5 kV switchgear and for the standby generators should be in a separate cabinet located away from the 5 kV cabinet for minimizing risk of arc flash to operating personnel in manual control mode.
- Control features of the 5 kV switchgear should include a programmable logic controller (PLC) with necessary local displays, automatic controls and communication features with remote SCADA system.
- The proposed two (2) transformers at the building "TU-2" should consist of outdoor type pad-mounted equipment with stainless steel and painted enclosures for corrosion resistance, with dual input selector switches, for facilitating power input from two sources.

The proposed configuration of the entire 5 kV power distribution system is shown in Figure 6.

7.1.3 Modification of existing High Service Pump Nos. 5 - 6 Building

The new 5 kV switchgear should be installed while the existing equipment remains energized and in operation, to avoid interruption of power to existing process equipment. This requires a larger electrical room and a possible option would be to move the north wall towards the existing space of the pump room by about 13 feet to the next structural building column line. To create the electrical room space, one exiting high service pump needs to be relocated, towards the north end of the pump room and connected to the existing available inlet and outlet pipe headers.

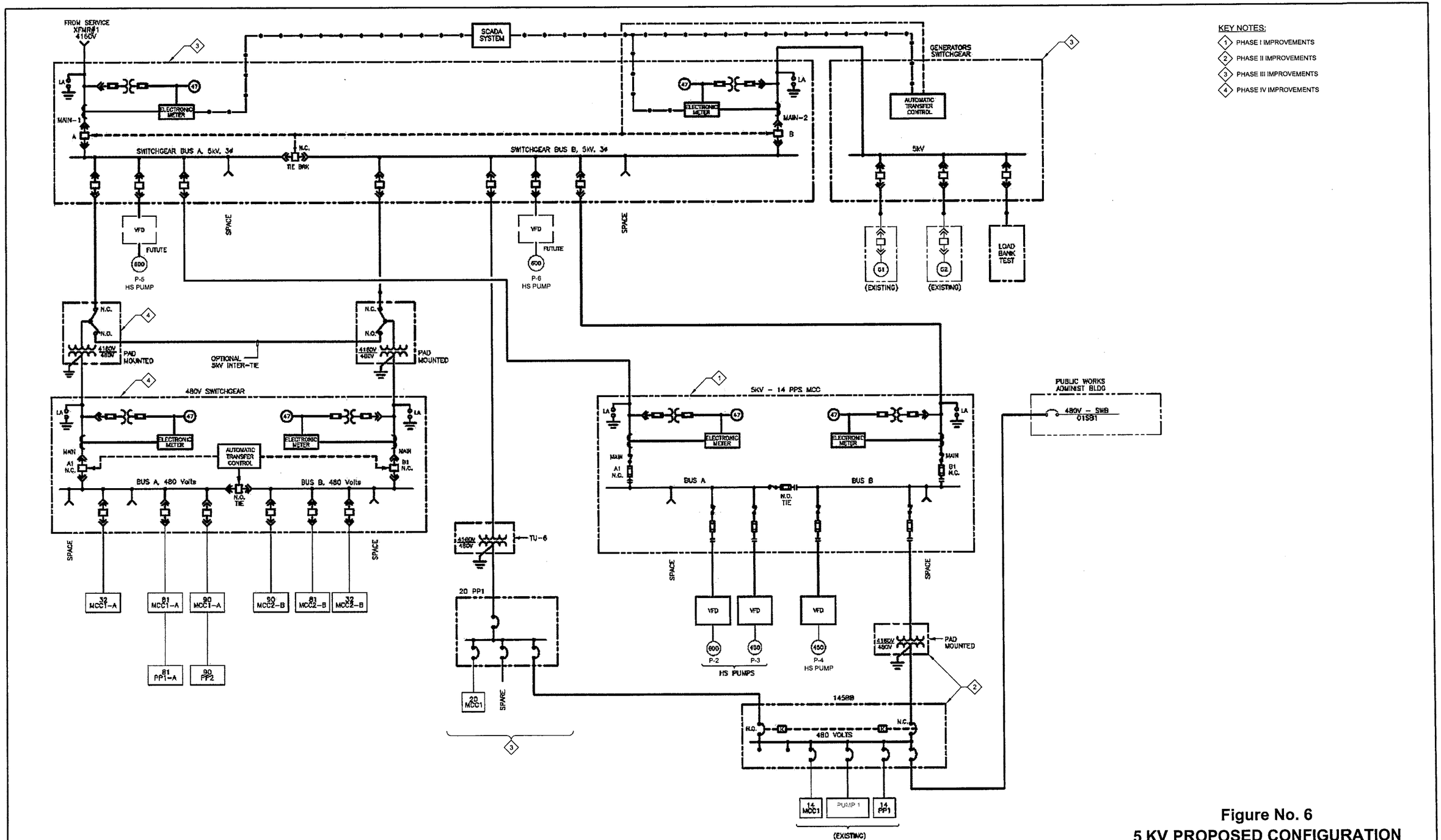

Figure No. 6

5 KV PROPOSED CONFIGURATION AND PHASES FOR IMPROVEMENTS

COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES

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The new electrical equipment will include the following items:

- An outdoor concrete pad type transformer to replace existing indoor unit
- A 480 volts switchboard with two main circuit breakers, a tie circuit breaker and breakers to feed the connected load.

A conceptual area for the proposed modifications to mechanical room space and electrical room space is shown in Figure 7.

7.1.4 Conceptual Layout of Electrical Equipment at High Service Pump Nos. 5 - 6 Building

A larger electrical room space will facilitate installation of new 5 kV switchgear in separate construction sequences while the existing equipment remains energized and in operation, to avoid interruption of power to existing process equipment.

The detail sequence for construction is not included at this time, but it shall be a very important part of the future design, to assure continuous power to the water treatment lime softening process and high service pumping.

The new electrical equipment will include the following items:

- 5 kV Switchgear with two main circuit breakers, a tie circuit breaker and breakers to feed the connected load.
- 5 kV Switchgear for the connection of two Generators
- Separate low voltage Control Panels for Generators
- Two new 480 volt motor control centers
- Probably a new PLC cabinet interconnected to SCADA to replace and upgrade existing unit.

A conceptual layout of proposed new 5 kV equipment is shown in Figure 8.

7.1.5 Proposed modifications to existing transformer buildings "TU-1 through TU-3"

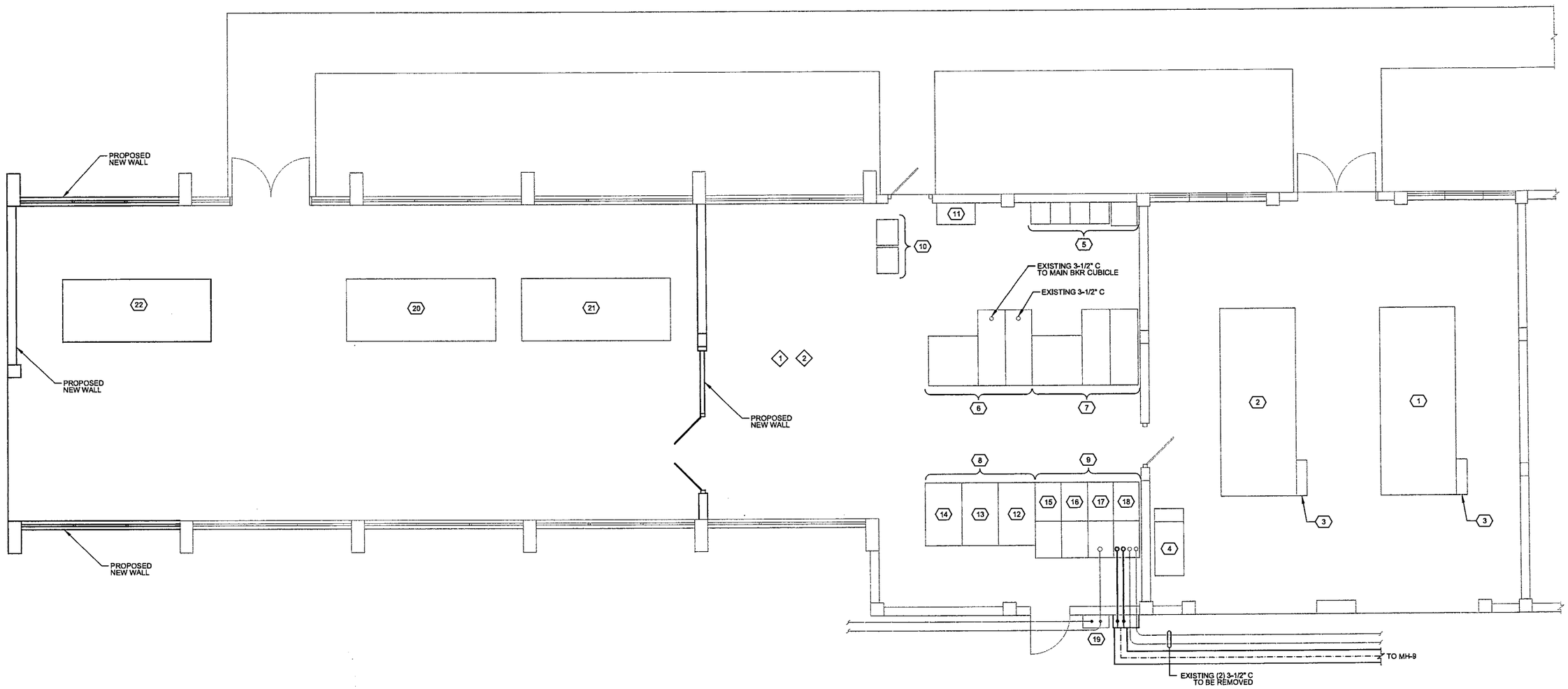
The removal of the 5 kV switches and transformers at the electrical buildings "TU-1" through "TU-3" is anticipated to be during a future Phase V for improvements and it is shown in Figure 9. Additional equipment observations and proposed new 480 volt equipment is shown in figures in Appendix A.

KEY TAGS:

1. EXISTING GENERATOR 1
2. EXISTING GENERATOR 2
3. EXISTING GENERATOR TERMINAL CABINET
4. EXISTING GENERATOR DAYTANK
5. EXISTING 20MCC2
6. EXISTING 20GEN2 CONTROL PANEL
7. EXISTING 20GEN1 CONTROL PANEL
8. EXISTING 20MCC1
9. EXISTING 20SWGR
10. EXISTING VFD
11. EXISTING PLC RI/O 2-1
12. FEEDER TO HIGH SERVICE PUMP NO. 5
13. FEEDER TO HIGH SERVICE PUMP NO. 6
14. FEEDER TO HIGH SERVICE PUMP NO. 7
15. TRANSITION SECTION
16. FPL MAIN BREAKER
17. FEEDER 2 - 20 PPSS
18. FEEDER 1 - 14 PPSS
19. EXISTING PB-A NEMA 3R
20. EXISTING PUMP NO. 6 (RELOCATED)
21. EXISTING PUMP NO. 5
22. PROPOSED (RELOCATED) ENGINE DRIVEN PUMP

KEY NOTES:

1. PROPOSED MODIFICATION FOR ELECTRICAL ROOM EXPANSION.
2. PROPOSED ROOM SPACE FOR NEW 5 KV SWITCHGEAR.



A FIG-1 PUMPS 5-6 BUILDING, 5 KV MAIN SWITCHGEAR, AND GENERATOR ROOM PLAN

SCALE: 1/4"=1'-0"
FILE:

Figure No. 7
PROPOSED PHASE III IMPROVEMENTS
COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES

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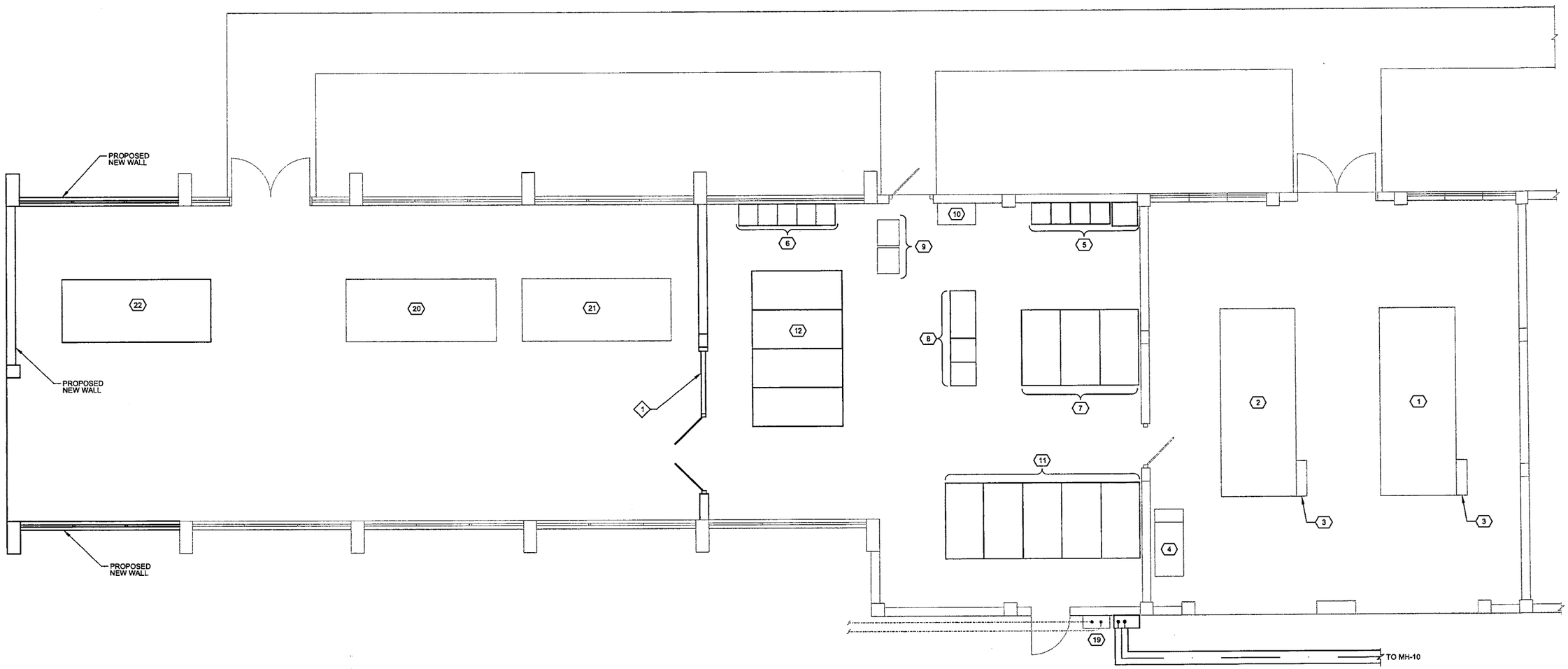
KEY TAGS:

1. EXISTING GENERATOR 1
2. EXISTING GENERATOR 2
3. EXISTING GENERATOR TERMINAL CABINET
4. EXISTING GENERATOR DAYTANK
5. NEW 20MCC2-A
6. NEW 20MCC2-B CONTROL PANEL
7. NEW GENERATOR 5 KV BREAKERS
8. NEW LOW VOLTAGE GENERATOR CONTROL PANELS
9. EXISTING VFD
10. EXISTING PLC RI/O 2-1
11. PROPOSED NEW 5 KV SWITCHGEAR - A
12. PROPOSED NEW 5 KV SWITCHGEAR - B
13. NOT USED
14. NOT USED
15. NOT USED
16. NOT USED
17. NOT USED
18. NOT USED
19. EXISTING PB-A NEMA 3R
20. EXISTING PUMP NO. 6 (RELOCATED)
21. EXISTING PUMP NO. 5
22. PROPOSED (RELOCATED) ENGINE DRIVEN PUMP

KEY NOTES:

1. PROPOSED MODIFICATION FOR ELECTRICAL ROOM EXPANSION.



A / FIG-1 PUMPS 5-6 BUILDING, 5 KV MAIN SWITCHGEAR, AND GENERATOR ROOM PLAN

SCALE: 1/4"=1'-0"
FILE:

Figure No. 8

PROPOSED PHASE IV IMPROVEMENTS

COPB-WTP-5 KV ELECTRICAL MASTER PLAN UPGRADES

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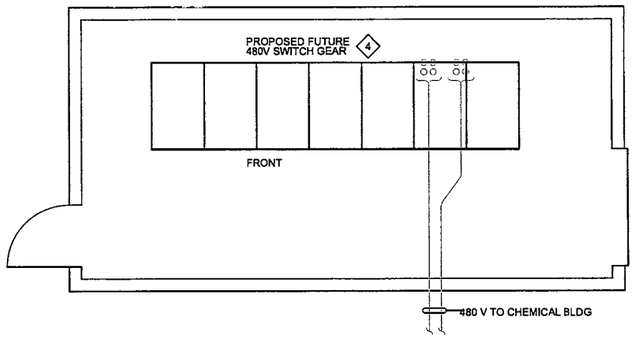
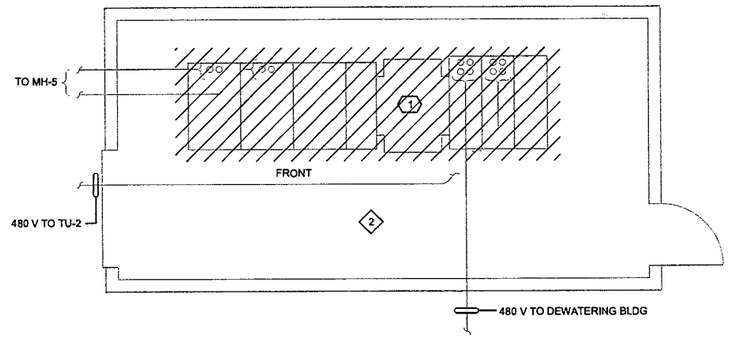


A FIG-2 ELECTRICAL BUILDING "TU-2"
SCALE: 1/4"=1'-0"
FILE:



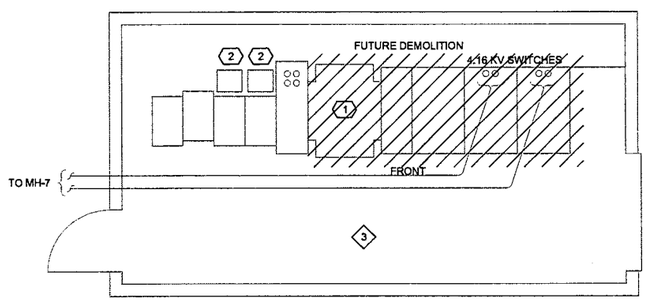
B FIG-2 ELECTRICAL BUILDING "TU-1"
SCALE: 1/4"=1'-0"
FILE:

KEY NOTES:

1. 5 KV SWITCHES AND TRANSFORMER TO BE DELETED. BUILDING TO BE IMPROVED FOR NEW 480 VOLT SWITCHGEAR
2. 5 KV SWITCHES AND TRANSFORMER TO BE DELETED. BUILDING WILL BECOME AVAILABLE FOR OTHER USE.
3. 5 KV SWITCHES AND TRANSFORMER TO BE DELETED. 480 VOLT SWITCHBOARD TO RECEIVE POWER FROM TU-2 SWITCHGEAR.
4. FUTURE 480 VOLT SWITCHGEAR WILL SUPPLY POWER TO MCC'S AT DEWATERING BUILDING. TRANSFER PUMP STATION AND CHEMICAL BUILDING.

KEY TAGS:

1. EXISTING 750 KVA TRANSFORMER
2. VFD



C FIG-2 ELECTRICAL BUILDING "TU-3"
SCALE: 1/4"=1'-0"
FILE:

Figure No. 9
PROPOSED PHASE V IMPROVEMENTS
COPB-WTP-5 KV ELECTRICAL
MASTER PLAN UPGRADES

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7.2 POWER MONITORING AND PROTECTIVE SYSTEM

The functioning of the electrical power system is essential for the reliability of the WTP and pumping of water. It is recommended that the new 5 kV equipment include state of the art features in power quality meters and protective devices for transient voltage surges caused by lightning and electronic relays for the fast tripping of circuit breakers due to possible short circuits or overloads.

The design of the new 5 kV equipment should be interconnected with the plant SCADA system, to allow the plant operators to continuously monitor normal status and/or any alarm condition.

Most of the modern electronic power meters and protective relays include communication features such as "Ethernet protocol" that would easily communicate and transfer data to the SCADA system.

8.0 OPINION OF PROBABLE CONSTRUCTION COST

The approach for estimating the opinion of probable cost for future construction is based on the following criteria:

- The costs represent a preliminary order of magnitude for master planning purposes.
- No preliminary design has been developed.
- The cost estimating process did not include quantity take-off of materials, site plans or account for project constraints.
- Equipment cost is a budget amount of typical list prices published by manufacturers.
- Labor for installation cost is based on a multiplier comparable to the equipment cost.
- Add-on Cost for general conditions such as construction management, mobilization, temporary storage, and incidental work is included as a percentage of the basic construction.
- A contingency of about 25 percent was included based on the planning level nature of the estimates.

Tables 2 - 6 include the major elements of the construction cost associated with the proposed master planning for the replacement of the 5 kV equipment.

Table 2 Phase I Opinion of Costs
Lime Softening Water Treatment Plant
City of Pompano Beach

No.	Description		Total
1	5" Electrical Underground Ducts and Manholes		$44,000
2	Doors and Concrete Work		$22,000
3	Backfill and Patch for Underground Work		$5,000
4	Air-Condition Two Rooms/Provide for Future 480 V Room		$70,000
5	Metal Conduit Work		$37,000
6	15 kV - 3# 350 KCM- Type MV-105 Cables & Terminations		$50,000
7	Two 5 kV - MCC & Busway (Replaces Outdoor 5 kV 14 PPS)		$400,000
8	Electrical Subcontractor Field and Project Management		$30,000
9	Contractor Fee to Assume Responsibility for Pre-Purchased 5 kV Equipment		$12,000
10	Installation Cost for 5 kV MCC and Overhead Busway		$10,000
11	Lighting/Fire Alarm/SCADA interconnect/Energy Meters		$25,000
12	Core Drilling/Concrete Wall Patching, Insulation and Painting		$60,000
13	**TOTAL DIRECT COST**		**$765,000**
14	Contingency	25.0%	$191,250
	Subtotal		**$956,250**
15	General Conditions (bonds, mobilization, insurance)	10.0%	$95,625
	Subtotal		**$1,051,875**
16	General Contractor Overhead, Profit & Risk	10.0%	$105,188
	Subtotal		**$1,157,063**
17	Sales Tax (Based on 50% of total direct cost)	6.0%	$22,950
	SUBTOTAL PHASE I PROJECT COST		**$1,180,013**
18	Owner's Reserve for Change Orders	2.5%	$29,500
	TOTAL PHASE I PROJECT COST		**$1,210,000**

Table 3 Phase II Opinion of Costs
Lime Softening Water Treatment Plant
City of Pompano Beach

No.	Description		Total
1	5" Electrical Underground Ducts		$5,000
2	Conflicts with Mechanical		$5,000
3	Backfill and Patch for Underground Work		$2,000
4	Metal conduit work		$25,000
5	480 Volt Cable Work		$30,000
6	15 kV - 3# 350 KCM- Type MV-105 Cables & Terminations		$30,000
7	One 5 kV/480 V Transformer and 480 V - MCC (Replaces 14 SB1)		$150,000
8	Installation Cost for 5 kV Transformer and MCC		$20,000
9	Doors and Concrete Work Refinish		$5,000
10	Core drilling, Insulation and painting		$5,000
11	Electrical Subcontractor Field and Project Management		$20,000
12	Air conditioning Extension for 480 V room		$2,500
13	**TOTAL DIRECT COST**		**$299,500**
14	Contingency	25.0%	$74,875
	Subtotal		**$374,375**
15	General Conditions (bonds, mobilization, insurance)	10.0%	$37,438
	Subtotal		**$411,813**
16	Contractor Overhead, Profit & Risk	15.0%	$61,772
	Subtotal		**$473,584**
17	Sales Tax (Based on 50% of total direct cost)	6.0%	$8,985
	SUBTOTAL PHASE II PROJECT COST		**$482,569**
18	Owner's Reserve for Change Orders	2.5%	$12,064
	TOTAL PHASE II PROJECT COST		**$495,000**

Table 4 Phase III Opinion of Costs
Lime Softening Water Treatment Plant
City of Pompano Beach

No.	Description		Total
1	Underground Ducts		$7,000
2	Backfill and Patch for Underground Work		$5,000
3	Metal conduit work and Supports		$10,000
4	480 Volt Cable Work		$20,000
5	One 5 kV/480 V Transformer and 480 V - MCC (Replaces 20 SB1)		$80,000
6	Installation and Testing of Electrical Equipment		$25,000
8	Relocation of High Service Pumps		$50,000
9	Walls, Core drilling, Insulation, Doors, Concrete Work Refinish and Painting		$150,000
10	Electrical Subcontractor Field and Project Management		$20,000
11	Air conditioning in Main Electric Room		$70,000
12	**TOTAL DIRECT COST**		**$ 437,000**
13	Contingency	25.0%	$109,250
	Subtotal		**$546,250**
14	General Conditions (bonds, mobilization, insurance)	10.0%	$54,625
	Subtotal		$600,875
15	Contractor Overhead, Profit & Risk	15.0%	$90,131
	Subtotal		**$691,006**
16	Sales Tax (Based on 70% of total direct cost)	6.0%	$18,354
	SUBTOTAL PHASE III PROJECT COST		**$709,360**
17	Owner's Reserve for Change Orders	2.5%	$17,734
	TOTAL PHASE III PROJECT COST		**$727,000**

Table 5 Phase IV Opinion of Costs
Lime Softening Water Treatment Plant
City of Pompano Beach

No.	Description		Total
1	Metal conduit work and Supports		$60,000
2	480 Volt Cable Work and 5 kV Cable Work		$80,000
3	Two 480 V - MCC (Adds redundancy to existent MCC)		$50,000
4	5 kV SWITCHGEAR and new Generator Controls (Replaces 20 SWGR)		$950,000
5	Installation and Testing of Electrical Equipment		$100,000
6	Rent of Temporary Standby Generators and Temporary Power		$95,000
7	Electrical Subcontractor Field and Project Management		$50,000
9	**TOTAL DIRECT COST**		**$1,385,000**
10	Contingency	25.0%	$346,250
	Subtotal		**$1,731,250**
11	General Conditions (bonds, mobilization, insurance)	10.0%	$173,125
	Subtotal		$1,904,375
12	Contractor Overhead, Profit & Risk	15.0%	$285,656
	Subtotal		**$2,190,031**
13	Sales Tax (Based on 70% of total direct cost)	6.0%	$58,170
	SUBTOTAL PHASE IV PROJECT COST		**$2,248,201**
14	Owner's Reserve for Change Orders	2.5%	$56,205
	TOTAL PHASE IV PROJECT COST		**$2,304,000**

Table 6 Phase V Opinion of Costs
Lime Softening Water Treatment Plant
City of Pompano Beach

No.	Description		Total
1	Underground Ducts and Manholes		$90,000
2	Backfill and Patch for Underground Work		$15,000
3	Metal conduit work and Supports		$40,000
4	480 Volt Cable Work		$120,000
5	Two 5 kV/480 V Transformers (Replace TU-1; TU-2 and TU-3)		$90,000
6	New 480 V Switchgear at Location of Building (TU-2)		$450,000
7	Installation and Testing of Electrical Equipment		$125,000
8	Construction of New Bldg at location of TU-2		$150,000
9	Walls, Core drilling, Insulation, Doors, Concrete Work Refinish and Painting		$75,000
10	Temporary Power		$75,000
11	Electrical Subcontractor Field and Project Management		$65,000
12	Air conditioning in new 480 V Electric Room		$50,000
13		**TOTAL DIRECT COST**	**$1,345,000**
14	Contingency	25.0%	$336,250
	Subtotal		**$1,681,250**
15	General Conditions (bonds, mobilization, insurance)	10.0%	$168,125
	Subtotal		**$1,849,375**
16	Contractor Overhead, Profit & Risk	15.0%	$277,406
	Subtotal		**$2,126,781**
17	Sales Tax (Based on 70% of total direct cost)	6.0%	$56,490
		SUBTOTAL PHASE IV PROJECT COST	**$2,183,271**
18	Owner's Reserve for Change Orders	2.5%	$54,582
		TOTAL PHASE V PROJECT COST	**$2,238,000**

Appendix A

ADDITIONAL FIGURES WITH EQUIPMENT ASSESSMENT (ISSUES) AND RECOMMENDATIONS

The condition assessment of each electrical equipment item and the pertinent recommendations are shown on the following pages.

Issues with Existing Water Service Pump 5 kV Motor Starters at Mezzanine Level:

- Electrical Tests Revealed Condition Susceptible to Potential Failure
- Manufacturer has Discontinued the Product
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- A Single Point of Failure will inhibit Pumping Water to the CITY.

Engineer Recommendation:

- Replace and Locate 5 kV MCC in Conditioned Space
- Re-Configure with Two Sources of Power per EPA- Class I Guidelines to Increase Reliability.
- Specify Separate Low Voltage Controls from 5 kV Cabinet for Personnel Safety

Issues with Existing 5 kV Power Switches Outdoor of High Service Pump Building:

- Severe Corrosive Condition
- CITY Building Department Required Replacement
- Electrical Tests Revealed Condition Susceptible to Failure
- A Single Point of Failure will Inhibit Pumping Water to the CITY.

Engineer Recommendation:

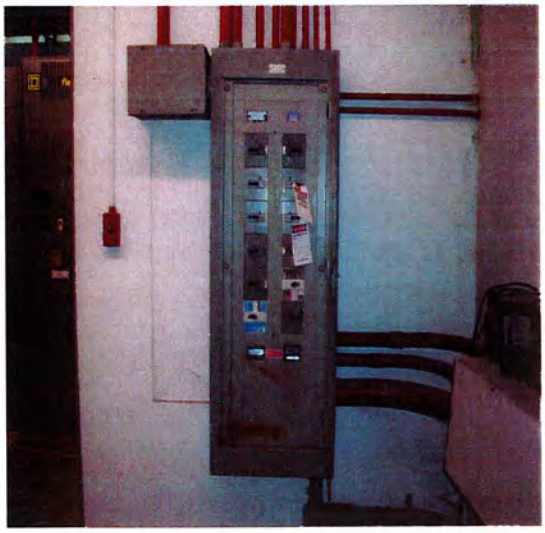
- Replace and Locate 5 kV Switches indoor in Conditioned Space
- Combined the Function with 5 kV MCC that Replace Unit at Mezzanine Level

Issues with Existing 5 kV/480 V Transformer (TU-4) and Switchboard (14 SB1) at Mezzanine Level:

- Substantial Corrosion
- Manufacturer has Discontinued supports for Breaker spare parts
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- Equipment Failure will inhibit power to SCADA controls and power supply to Public Works building.

Engineer Recommendation:

- Replace and Locate Transformer Outdoor
- Replace switchboard with MCC and Two Sources of Input Power.
- Replace related 480 V MCC and old Panelboards in Electric Room.

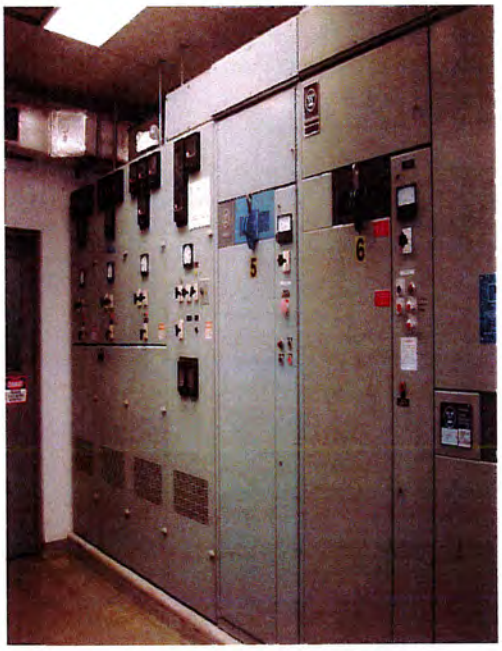


Issues with Existing 480 V Panelboards at High Service Pump Building 1-4:

- Partial Corrosive Condition
- Limited Circuit Breaker Parts
- Electrical Tests Revealed Condition Susceptible to Failure
- Failure will Inhibit Power Supply to Building Lighting, HVAC and other important loads.
- Remove Non-used Items

Engineer Recommendation:

- Replace and Locate in Conditioned Space to prevent corrosion.
- Provide ArcFlash Labels
- Distribute load with other Panel.

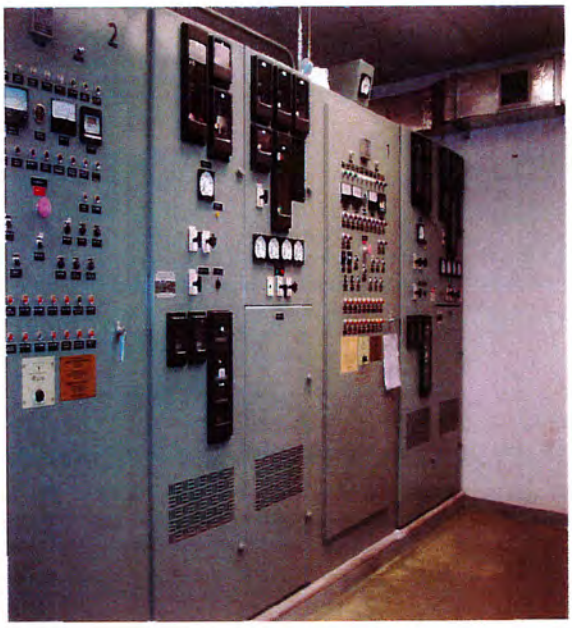


Issues with Existing 5 kV Main Switchgear 20 SWGR and 5 kV MCC at High Service Pumps Building 5-6:

- Equipment Does Not Have Means to Facilitate Momentary Shutdown for Periodic Inspection and Maintenance
- Manufacturer has Discontinued Supports for Relay Spare Parts
- No Labels to Comply with NFPA-72 Code for Personnel Safety.
- Single Point (of Bus) Failure will Shutdown Entire Lime Softening Plant and all High Service Pumps.

Engineer Recommendation:

- Replace with State of the Art Switchgear, including a Tie Breaker for Momentary Periodic Inspection and Maintenance
- Provide Labels for Warning Arc Flash Hazard
- Improve Air Conditioning Reliability for Main Electric Room.
- Increase Electrical Room Space



Issues with Existing Controls for 5 kV Generators

- Near the End of Reliable Life Cycle
- Limited Flexibility for Manual Controls during Failure of Automatic Control
- Proximity of Low Voltage Controls near 5 kV Equipment.
- Failure will Inhibit reliable Standby Generator Power.

Engineer Recommendation:

- Replace and Locate Low Voltage Controls in Separate Cabinet Away from 5 kV Equipment
- Design State of the Art Controls for Generator Equipment.
- Interconnect with SCADA for Monitoring Status

Issues with Existing 5 kV Switches 20 PPSS at High Service Pumps Building 5-6:

- Substantial Corrosive Condition
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- Single Point (Bus) Failure may Shutdown Power to other Parts of the Plant.

Engineer Recommendation:

- Replace with Indoor Equipment as part of upgrades to Main 5 kV Switchgear
- Do not Install Outdoor.

Issues with 5 kV/ 480 V Transformer TU-6 and Switchboard 20 SWB1

- Near the End of Reliable Life Cycle
- Partial Corrosion due to Non-Conditioned Room Space
- It Shall Not Be Located in HS Water Pumps 5-6 Room.
- Failure will Inhibit 480 V Power to Essential Motor Control Center in Main Electrical Room.

Engineer Recommendation:

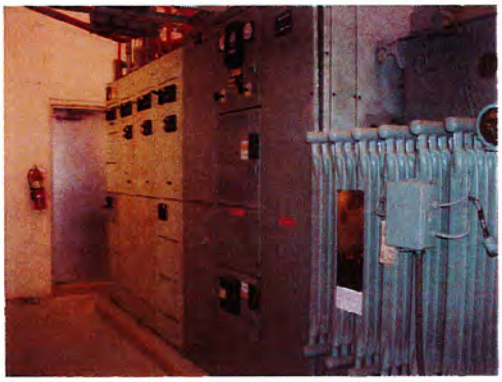
- Replace and Locate in Separate electric room with Air Conditioned Space.
- Design Switchboard with Two Main and Tie Breakers to facilitate Periodic Inspection and Maintenance

Observation of Existing 5 kV Switches and Transformer at TU-3 Electrical Building (near Transfer Pumps):

- Fair Condition, Near the End of Usable Life
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- High Equipment Cost to Replace for Small Load of Transfer Pumps.
- Rear Access Space Does Not Comply with NEC CODE for Working Clearances.

Engineer Recommendation:

- Add Arc Flash Labels
- Consider Deleting 5 kV Equipment and Obtain Power Supply from TU-2 Building for 480 V MCC and Transfer Pumps
- TU-3 Building Space may be used for Better Layout of Future New VFDs.



Observation of 480 V Switchboard and MCC at Transfer Pumps Building

- Fair Condition for Its Use
- No Arc Flash Labels
- Engineer Comments:
- Add Arc Flash Labels for Compliance with Current Code.

Observation of Existing 5 kV Switches and Transformer at TU-2 Electrical Building (near Chemical Building):

- Fair Condition, Near the End of Usable Life
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- High Equipment Cost to Replace for Small Load at Chemical Building.
- Rear Access Space Does Not Comply with NEC CODE for Working Clearances.

Engineer Recommendation:

- Add Interim Arc Flash Labels
- Consider Deleting in its Entirety
- Replace Building with Larger Room and Higher Overhead Clearances for Installation of 480 Volt Switchgear that could Supply Power to other Nearby Facilities.

Proposed 480 Volt Switchgear:

- Modern Design with Two Sources of 480 V Power from Outdoor Pad Mounted Transformers.
- Switchgear would Supply Power to Chemical Building Load, Dewatering Process and Transfer Pump Station.

Observation of Existing 5 kV Switches and Transformer at TU-1 Electrical Building (near Dewatering Bldg):

- Fair Condition, Near the End of Usable Life
- Labels Do not Comply with NFPA-72 Code for Personnel Safety.
- High Equipment Cost to Replace for Small Load of Dewatering Process.
- Rear Access Space Does Not Comply with NEC CODE for Working Clearances.

Engineer Recommendation:

- Add Arc Flash Labels
- Consider Deleting 5 kV Equipment and Obtain Power from TU-2 Building for 480 V MCC at Dewatering Process.
- TU-1 Building Space may be used for other purposes.

Observation of 480 V Switchboard and MCC at Dewatering Building

- Fair Condition for Its Use
- No Arc Flash Labels
- Engineer Comments:
- Add Arc Flash Labels for Compliance with Current Code.
- Obtain 480 V Power from Proposed new Switchgear at Building "TU-2"

Proposed 5 kV Main Switchgear (at HS Pumps Building 5-6):

- State of the Art for 5 kV Power Distribution
- Labels will Comply with NFPA-72 Code for Personnel Safety.
- Flexible for Periodic Inspection and Maintenance
- Ample Front and Rear Access Space per NEC CODE for Working Clearances.

Proposed Low Voltage Control Cabinets for 5 kV Standby Generators

- State of the Art Controls
- Separate from 5 kV Cabinets for No Arc Flash Hazard
- Interconnected with SCADA for Convenient Monitoring and Periodic Generator Exercise.

2/4/20

Optional Site Visit for 6-04-20

1 Stephen Bailey Bailey Engineering 561 252 1304

2 Mark Ludwigson Carollo 954-295-8189

3 Dameion Donaldson Electrical Design Associates (561) 819-5556

City of Pompano Beach, Purchasing Division
1190 N.E. 3rd Avenue, Building C
Pompano Beach, Florida, 33060

February 18, 2020

ADDENDUM #3 BID E-04-20

Master Plan Update, and Consulting Services for
Water Treatment Plant 5 kV Electrical System

To Whom It May Concern,

The following change has been made to the "Revised" solicitation document:

References for past (3) similar projects in size and scope in the ~~tri-county area (Broward, Palm Beach, and Miami-Dade.)~~ State of Florida. Describe the scope of each project in physical terms and by cost, describe the respondent's responsibilities, and provide the contact information (name, email, telephone number) of an individual in a position of responsibility who can attest to respondent's activities in relation to the project

Addendum #3 is posted on the City's eBid website: http://pompanobeachfl.ionwave.net. Acknowledge receipt of this Addendum using the Addendum Attribute on the Attributes tab in the eBid System.

The deadline for Questions and Answers in the eBid system has passed.

The deadline for acceptance of proposals in the eBid system is **2:00 p.m. (local), February 20, 2020.**

The remainder of the solicitation is unchanged at this time.

Sincerely,

Jeffrey English, Purchasing Agent

City of Pompano Beach, Purchasing Division
1190 N.E. 3rd Avenue, Building C
Pompano Beach, Florida, 33060

February 20, 2020

ADDENDUM #4 BID E-04-20

Master Plan Update, and Consulting Services for
Water Treatment Plant 5 kV Electrical System

To Whom It May Concern,

The following change has been made on the attributes tab:

Attribute 5 for “Vendor Certification Regarding Scrutinized Companies Lists” has been corrected

Addendum #4 is posted on the City’s eBid website: http://pompanobeachfl.ionwave.net. Acknowledge receipt of this Addendum using the Addendum Attribute on the Attributes tab in the eBid System.

The deadline for Questions and Answers in the eBid system has passed.

The deadline for acceptance of proposals in the eBid system is **2:00 p.m. (local), February 20, 2020.**

The remainder of the solicitation is unchanged at this time.

Sincerely,

Jeffrey English, Purchasing Agent

Online Questions & Answers

Event Information

Number:	E-04-20 Addendum 4
Title:	Master Plan Update, Design and Consulting Services for
Type:	Request for Qualifications
Issue Date:	1/14/2020
Question Deadline:	2/13/2020 05:00 PM (ET)
Response Deadline:	2/20/2020 02:00 PM (ET)
Notes:	Pursuant to Florida Statutes Chapter 287.055 "Consultants' Competitive Negotiation Act" the City of Pompano Beach invites professional firms to submit qualifications and experience for consideration to provide professional design and consulting engineering services, including: advanced water treatment systems, electrical system master planning, bid specifications, permitting services, bidding assistance, construction services and certifications to the City for the project listed below:

Project: Master Plan Update, Design and Consulting Services for:
Water Treatment Plant 5 kV Electrical System

The City will receive sealed proposals until **2:00 p.m. (local), February 20, 2020**. Proposals must be submitted electronically through the eBid System on or before the due date/time stated above. Any proposal received after the due date and time specified, will not be considered. Any uncertainty regarding the time a proposal is received will be resolved against the Proposer.

Proposer must be registered on the City's eBid System in order to view the solicitation documents and respond to this solicitation. The complete solicitation document can be downloaded for free from the eBid System as a pdf at: https://pompanobeachfl.ionwave.net/CurrentSourcingEvents.aspx. The City is not responsible for the accuracy or completeness of any documentation the Proposer receives from any source other than from the eBid System. Proposer is solely responsible for downloading all required documents. A list of proposers will be read aloud in a public forum.

Published Questions

Question: Will you please provide the sign-in sheet from the site visit?

Answer: The sign-in sheet for the OPTIONAL meeting is included as an attachment, per Addendum 2.

Asked: 2/6/2020 03:43 PM (ET)

Question: Page 3 of the RFQ states that: The document is attached: City of Pompano Beach Lime Softening Water Treatment Plant TECHNICAL MEMORANDUM No. 1 EVALUATION OF 5 kV ELECTRICAL SYSTEM FORMASTER PLANNING UPGRADES FINAL July 2012 It does not appear to be attached. Where can I find this document?

Answer: Technical Memorandum No. 1 is included as an attachment, per Addendum 2.

Asked: 2/6/2020 03:41 PM (ET)

Question: Section D, References: This section of the RFQ requires submittal of references for past (3) similar projects in size and scope in the tri-county area. We would like to request that the submittal of references for similar projects in size and scope include projects in the State of Florida instead of being limited to the tri-county area.

Answer: Per Addendum 3, the references section has been modified to include projects in the State of Florida.

Asked: 2/6/2020 01:27 PM (ET)

Question: Please confirm that a LEED accredited professional is required on this project. Our Team does not foresee any LEED accredited building on this project.

Answer: No, LEED AP is not a minimum requirement.

Asked: 2/6/2020 01:27 PM (ET)

Question: Is the prime firm required to have a local office to receive full points as a Tier 1 Local Vendor, or does having a subconsultant with an office in Pompano Beach meet that requirement?

Answer: To receive Tier 1 percentage points, the prime must therefore have a Local Pompano Beach Office, and fulfill other requirements per City Ordinance 2018-46. A sub-contractor can only meet the definition of a Local Vendor Subcontractor.

Asked: 2/5/2020 12:47 PM (ET)

Question: When is the last day for questions?

Answer: The last day for questions has been extended to 5:00 (local) February, 13, 2020

Asked: 2/5/2020 11:22 AM (ET)

Question: The RFQ states that a technical memorandum is attached “City of Pompano Beach Lime Softening Water Treatment Plant Technical Memorandum No. 1 Evaluation of 5 kV Electrical System for Master Planning Upgrades Final July 2012”. It appears that this technical memorandum is not available for download on the City’s website. Please provide a copy of the technical memorandum for our use.

Answer: Technical Memorandum No. 1 is included as an attachment, per Addendum 2.

Asked: 2/5/2020 11:19 AM (ET)

Question: On page 3 of the RFQ it states the following documents are available for review: City of Pompano Beach Lime Softening Water Treatment Plant TECHNICAL MEMORANDUM No. 1 EVALUATION OF 5 kV ELECTRICAL SYSTEM FOR MASTER PLANNING UPGRADES FINAL July 2012. Where can this document be found for review?

Answer: Technical Memorandum No. 1 is included as an attachment, per Addendum 2.

Asked: 1/31/2020 10:06 AM (ET)

Question: Since this is not a fee-based proposal, how will the specified “Level of effort” be evaluated, and what information is to be submitted to allow this evaluation? Level of effort is specified under the Criteria for #4 Technical approach to perform the tasks described in the Scope of Services: on page 5 of the RFQ.

Answer: Level of Effort refers to the general approach a proposer will take to provide the services requested as part of this RLI. You may submit any and all information that establishes how your firm will provide the services, i.e., schedule, priority, general planning, etc.

Asked: 1/30/2020 03:41 PM (ET)

Question: Will there be a pre bid for this proposal?

Answer: There will NOT be a mandatory pre-bid. We will offer a ONE-TIME site visit to tour the plant on TUESDAY, FEBRUARY 4th from 1:30 - 3:00 PM. While this visit is NOT mandatory, it is recommend all potential bidders attend this site visit.

Asked: 1/22/2020 11:57 AM (ET)

ACORD

CERTIFICATE OF LIABILITY INSURANCE

7/4/2024

DATE (MM/DD/YYYY)
6/29/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Lockton Companies
444 W. 47th Street, Suite 900
Kansas City MO 64112-1906
(816) 960-9000
kcasu@lockton.com

CONTACT NAME:
PHONE (A/C, No, Ext):
FAX (A/C, No):
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : Zurich American Insurance Company	16535
INSURER B : Allied World Surplus Lines Insurance Company	24319
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED
1472613 CAROLLO ENGINEERS, INC.
2795 MITCHELL DR.
WALNUT CREEK CA 94598-1601

COVERAGES **CERTIFICATE NUMBER:** 19695561 **REVISION NUMBER:** XXXXXXX

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY [X] PRO-JECT [ ] LOC OTHER:	Y	Y	GLO 9730569	7/4/2023	7/4/2024	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 1,000,000 $ 25,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO OWNED AUTOS ONLY [ ] SCHEDULED AUTOS X HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY	N	Y	BAP 9730571	7/4/2023	7/4/2024	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) DED: COMP/COLL	$ 2,000,000 $ XXXXXXX $ XXXXXXX $ XXXXXXX $ 1,000
	[ ] UMBRELLA LIAB [ ] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			NOT APPLICABLE			EACH OCCURRENCE AGGREGATE	$ XXXXXXX $ XXXXXXX $ XXXXXXX
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) [N] If yes, describe under DESCRIPTION OF OPERATIONS below	N / A	Y	WC 9730570	7/4/2023	7/4/2024	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
B	PROFESSIONAL LIABILITY UNLIMITED PRIOR ACTS	N	N	0313-9010	7/4/2023	7/4/2024	EACH CLAIM: $1,000,000; AGGREGATE: $1,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
Phase IV Electrical Master Plan Improvements, Agreement No. 2015. City of Pompano Beach is additional insured as respects general liability and this coverage is primary and non-contributory, as required by written contract. Contractual liability is included in the general liability subject to the policy terms, conditions and exclusions. (SEE ATTACHED.)

APPROVED
By Danielle Thorpe at 2:41 pm, Jul 10, 2023

CERTIFICATE HOLDER

19695561
City of Pompano Beach
100 West Atlantic Blvd
Pompano Beach FL 33060

CANCELLATION See Attachments

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE